



**An exploration of VRIO resource
development and competitive advantage in
SMEs operating in a niche science education
market in Europe.**

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University for the degree of Doctor of Philosophy

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Abstract

Despite the plethora of empirical scholarship on competitive advantage in firms, there is a scarcity of literature explaining the relationship between firm performance, value creation and sustainable competitive advantage in an SME context. Popular theories such as the Resource-based View (RBV) analyses and interpret internal resources of the organisations and emphasises resources and capabilities in formulating a strategy to achieve sustainable competitive advantages. Resources are considered as inputs that enable firms to carry out their activities. Internal resources and capabilities determine strategic choices made by firms while competing in their external business environment. According to RBV, not all the resources of the firm will be strategic resources. Competitive advantage occurs only when there is a situation of resource heterogeneity and resource immobility. Specifically, the resources must satisfy the criteria of being valuable, rare, inimitable, and highly organised. However, the RBV is unclear on what are the specificities of resources and avoids a concrete definition of value.

Moreover, the theoretical tenets of the theory remain unclear, and there has not, as yet, developed sufficient understanding of the micro-level organisational strategies which build sustained competitive advantage. Empirical studies have also steered clear of tackling the ontological and epistemological interpretations of the relational aspects of resource building in SMEs. It is for this reason, the inner workings of this 'black-box' of VRIO creation remain elusive. This empirical study aims to present a unique opportunity to address this gap. Following a mixed-methods approach, an exploratory quantitative pilot study surveyed 41,857 customers (8% response rate) and a main qualitative multi-case study of 13 different SMEs in 13 different countries. The qualitative review forms the central basis of the research findings. The interpretation of the findings was through an abductive Template Analysis approach complemented by a retroductive reflection in conclusion.

The study links the scholarly domains of boundary spanning, the knowledge-based view and the RBV and suggests that a new approach and interpretation of value creation and resource configuration is timely for the RBV. To date, the RBV is positioned at the macro-level, and it has not been applied with much enthusiasm at the micro-level. This study has identified that RBV is an important and useful framework. However, its shortcoming in elucidating what and where value is created, and the true nature of resources has been highlighted. Also, the applicability of the RBV framework on a practical level for SMEs is shown to be deficient. Therefore, the study contributed to the field an acknowledgement that empirical research at the SME level adds substantially to the understanding of the RBV field in terms of value creation and capture. Moreover, the study contributes to a new way to view the RBV in terms of using complementary constructs to aid in understanding the RBV in more practical terms: the research findings enhance the development of RBV theory, research, and practice in SMEs.

The following important conclusions emerge from this study: First, the current conceptualisation of VRIO resources in terms of their relational structure has been subject to unnecessary ontological ambiguity in the RBV literature. Second, the effects of routine and deliberate learning in SMEs result in different outcomes in value creation and value capture. Third, the managerial agency and knowledge accumulation through boundary spanning are critically effective mechanisms to help an SME develop important VRIO resources. Fourth, the study concluded that VRIO resources are not irreducible to, but overlap and are interrelated, and thus should not be ignored in the RBV literature. Fifth, where VRIO resources lead to competitive advantage in SMEs, they must be supported by an infrastructure of lower-order VRIO resources. Sixth, value creation and capture are separate entities that cannot always be defined in simple monetary terms. However, the findings show that they are related entities, although

distinct. The research concludes that value capture back to the firm in higher profits, or long-term loyal customers is supported through the correctly configured VRIO resources. Seventh, from a theoretical perspective, this study is the first to merge constructs of KM, KAM and boundary-spanning with the RBV (and a lesser extent, dynamic capability theory). Eighth, the study shows that the RBV can be practically grounded if a clear and precise identification of ‘value’ and ‘resources’ are available. Finally, the research brings the focus back on SMEs and shows the need for a much higher level of empirical engagement in this area.

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1 Introduction

This study is concerned with how small and medium-sized enterprises (SMEs) create and sustain competitive advantage. The basic premise underpinning this study is that many of the strategic management concepts that apply to firms outside of the SME definition are also directly relevant to SMEs trying to improve their firms' competitiveness. However, as discussed in this thesis, the nature of strategic management or operational activities will be very different in SMEs than in large, well-resourced companies.

Resource-based view (RBV) proponents (Barney, 1991) gets to the heart of what is undoubtedly the most critical aspect of management in organisations, namely the necessity to survive and hence knowledge of the factors that give rise to competitive advantage and how it can be sustained. Competitive advantage is defined and conceptualised in many ways in the strategic management construct. Often there is a disjoin in their respective conceptualisations; however, a common emphasis is placed on how to leverage the firm's resources to create and sustain value for the organisation and its different stakeholders. Despite the tensions across the domains, an active research base continues to advance the construct conceptually and empirically. Advocates of the RBV (Barney, 2001) and critics (Collis, 1994; Priem & Butler, 2001a) elucidate several issues that warrant further empirical research. The most pressing is the classification and quantification of value in the context of the customer as well as the firm and how it is created and captured. Resources are central to the RBV, but there is little clarity on the source of resources, the degree of specification and the extent to which they are interrelated.

Critics lament the inadequacies of RBV advocates in avoiding a clear definition of what constitutes a resource, which is undoubtedly inhibiting the theory from further development. Thus, further application of RBV in the fields such as marketing, knowledge management, sales management and organisational science is severely hampered until a clear delineation is established between resource assets, processes, and capabilities. As Barney (1997) and Collis & Montgomery (1995) agree, 'resource assets, processes, and capabilities' are the core elements of any theoretical resources-based framework. The future development of the theory may be significantly enhanced if the specific resources could be identified that generate the value-added attributes that ensure customers remain loyal to the firm (those specific attributes that appear to be difficult to imitate are rare, organised etc.). Of equal importance is how value is then captured and leveraged by the firm to retain sustained competitive advantage.

The lack of specificity and clear definitions of resources and what is meant by ‘value’ in the literature restricts the expansion of the RBV into more general organisation theories. Although Thompson (1967) has produced an excellent and substantial body of work into the theory of the organisation, bridging the gap between the RBV and its broader applications across related areas of management theory has still not progressed much. In addition, RBV empirical research has, in the main, avoided a focus on SMEs. It is somewhat surprising since the creation and capture of values through resources and capabilities are more visible than through larger organisations, and thus, easier to recognise and identify.

In addressing these gaps, this study draws from different but related theories of knowledge management (KM), dynamic capability (DC), key account management (KAM), boundary spanning and organisational theory to support the RBV framework in delineating value creation and the interrelationships of resources.

1.1 The Rationale for the Study

The purpose of this study is to explore how an SME can create resources that have value, are rare, costly to copy by rivals and expertly organised in such a way as to lead the firm to competitive advantage. The study expects to extend the resource-based theory to consider the contribution of all resources (including one of less significance) to SME performance such that value is first created and then captured back. The study contends that a symmetrical analysis of adjoining constructs of sales, boundary spanning and knowledge generation within the overall organisational concept, will shed new light on the sources of value creation and resource configurations in SMEs for superior performance. Thus, the aim is to contribute to an extended theory of the RBV to explicate and explain the sources of value, resource specification, and boundary spanning to understand the paths that lead to sustained competitive advantage in SMEs.

1.2 The Aim and Objective of the Study

This study is concerned with how small and medium-sized enterprises (SMEs) create and sustain competitive advantage to explore this key research aim. The literature will be reviewed from the Resource-Based View (RBV), Dynamic Capability (DCV), key account management (KAM), knowledge management, boundary spanning and organisational theory with a focus towards competitive advantage. Pursuing this aim will not be without difficulty as the convergence in the empirical literature about the core theoretical tenets of the RBV and the DCV and their contribution to competitive advantage, and firm performance remains unclear (Pezeshkan et al., 2016). Indeed, several studies document a positive correlation between VRIO resources, and in other circumstances, dynamic capabilities and firm performance (Fang & Zou, 2009); others noted insignificant or adverse effects (Wilden, Gudergan, Nielsen, & Lings, 2013). Empirical studies have primarily viewed the

VRIO resources and capabilities as being composed of relational assets or practised routines that somehow are operationalised inside the elusive ‘black-box’, of which little is understood.

The following research questions support the research aim:

- RQ1: How does knowledge integration through customer orientation and boundary spanning influence VRIO resource configurations?
- RQ2: How do knowledge generation and KAM managerial actions contribute to attaining competitive advantage through the development of VRIO resources?
- RQ3: Where is the value created and captured by the firm?

The three RQs are critical to determining the key aim of the research for the following reasons:

- (RQ1). The resources available to SMEs are scarce compared to larger rivals. Therefore, critical market knowledge must be captured in the most economical and rapid methods by an SME. The conclusions from the literature review in this study reveal that boundary-spanning activities are an effective and efficient way to communicate critical market knowledge to SME managers so that VRIO resources are developed in the correct way (Van de Ven & Zahra, 2016). The focus on the customer ensures that the boundary-spanning activities are focused on their needs so that knowledge passed to SMEs facilitates more personal service to the customer.
- (RQ2). Key account management (KAM) provides the bridge of knowledge between the boundary spanning activities and the managers in the SMEs. The construct of KAM facilitates and explains how critical market knowledge assimilates into the SME and is converted to the important VRIO resources that can lead to competitive advantage. KAM provides a framework in which to elucidate the different types of sales professionals in an organisation. Moreover, KAM casts some light on using the more technically orientated sales professionals and how they can be a more effective conduit in building on boundary-spanning knowledge to create VRIO resources.
- Finally, RQ3 exposed the critical gap in the RBV literature regarding its explication of competitive advantage. The focus of RQ3 is to determine what exactly a customer regards as value and what value are they prepared to pay a premium. Building on RQ1 and RQ2, the final RQ seeks to determine and quantify value both from a creation and capture point of view. Concluding from RQ1 how an SME knows *what* VRIO resources to build, and from RQ2, *how* are the VRIO resources created? RQ3, therefore, confronts the mechanisms that underpin competitive advantage by using a measure of value creation for the customer and then value capture back to the firm.

The extant empirical research into RBV has concentrated mainly on large organisations and focuses on more distal measurable outcomes such as innovation, brand awareness, share/market value, market share and financial considerations (Barney, 2001; Fahy & Smithee, 1999; Grant, 1991; Mahoney, 2001; Peteraf, 1993; Priem & Butler, 2001b; Wernerfelt, 1984a; Williams, 1992). The most vocal of RBV supporters admit that there has been little attention in the RBV literature to unpacking how resources are converted into something of value to external stakeholders (Barney, 2001). The need for clarity as to when a resource is valuable and when it is not is absent from the RBV literature, despite Barney (2001, p. 43) stating:

“...the value of resources with theoretical tools that specify the market conditions under which different resources will and will not be valuable...”

Further criticism of RBV centres on its lack of specification of resources, the absence of any parameterisation of value, and its avoidance of what constitutes a competitive advantage. Exploring the critical dimensions of customer value and how they lead to competitive advantage is the underlying theme of RQ3. To guide the research and the three RQs, the literature review builds under three key areas: the RBV, the knowledge-based view and key account management (KAM).

KAM is utilised as an umbrella literature group that uses customer-focused strategies as a basis to explore the contributions of specialist sales staff, boundary-spanning activities and the organisational view from Thompson (1976). The conceptual model then builds on contributions from RBV (including some reference from the DCV) with the knowledge-based View (KBV) to explore the fine-grained construction of VRIO resources that create value, and ultimately, competitive advantage. Figure 1.1 following, outlines the sequence through which the literature review is developed.

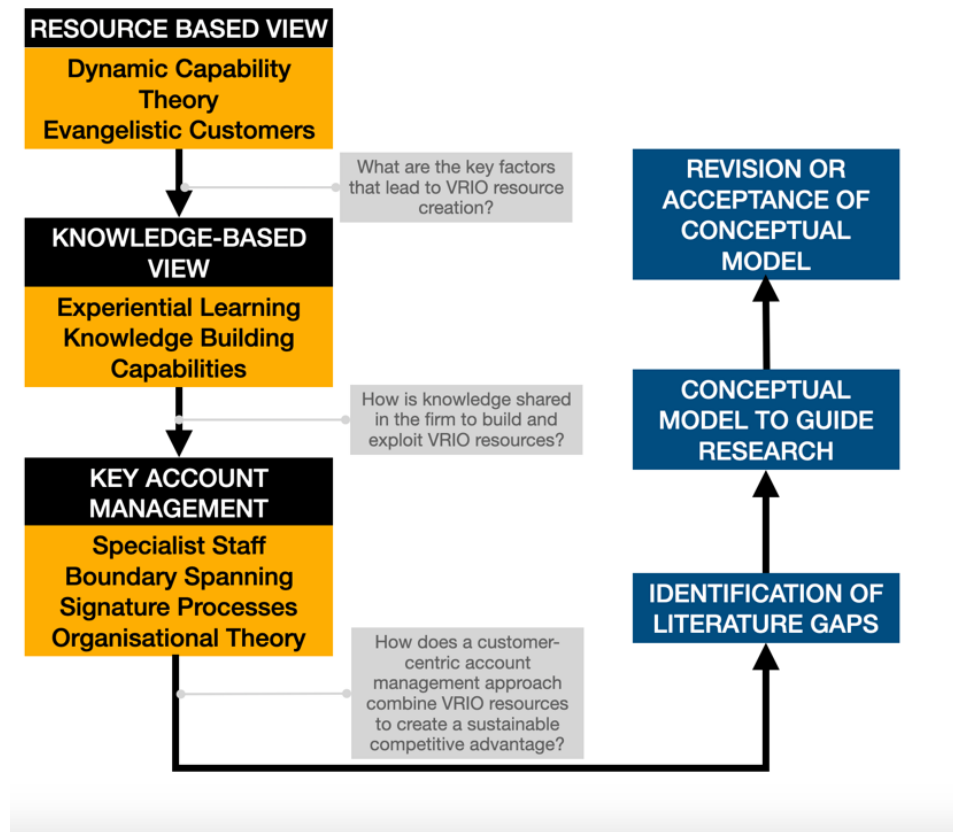


Figure 1-1 – Literature Plan

1.3 Background to the Study

Data logging, as a tool to teach science in secondary schools, has been in existence for over 30 years. A typical data logging system comprises a handheld device to collect and analyse data collected from different sensors taking measurements in everything from temperature to heart rate. It is only in the past decade that technology has gained more prominence mainly due to the rapid development and integration of computers, and more recently mobile technologies in schools (for example smart tablets, phones and interactive whiteboards). With this fast pace of technological development companies that operate exclusively in the educational market are faced with exogenous change never experienced in the traditionally staid market. Some firms have become more adept at coping with rapid change, while others have struggled. The reasons as to why this is the case are not easily explained, or indeed predicted.

Despite empirical research confirming increased use of data-loggers can escalate student engagement and improve conceptual understanding of science, adoption of the technology to the classroom by teachers has been slow and still meets with opposition by educators (Newton, 2000; Osborne, 1998; Wellington, 2013). The supplier, therefore, must overcome challenges in communicating a compelling marketing message to a sceptical customer. This multi-case study focuses on thirteen

Small to Medium-Sized Enterprises (SMEs) across Europe to understand how they adapt and compete in the market. Each of the SMEs acts as sole distributors for the data-logging product that is manufactured in the United States and then shipped to each of their exclusive international dealers (the thirteen SMEs in this study). A quick overview of the employed business model is summarised in Figure 1.2 below.

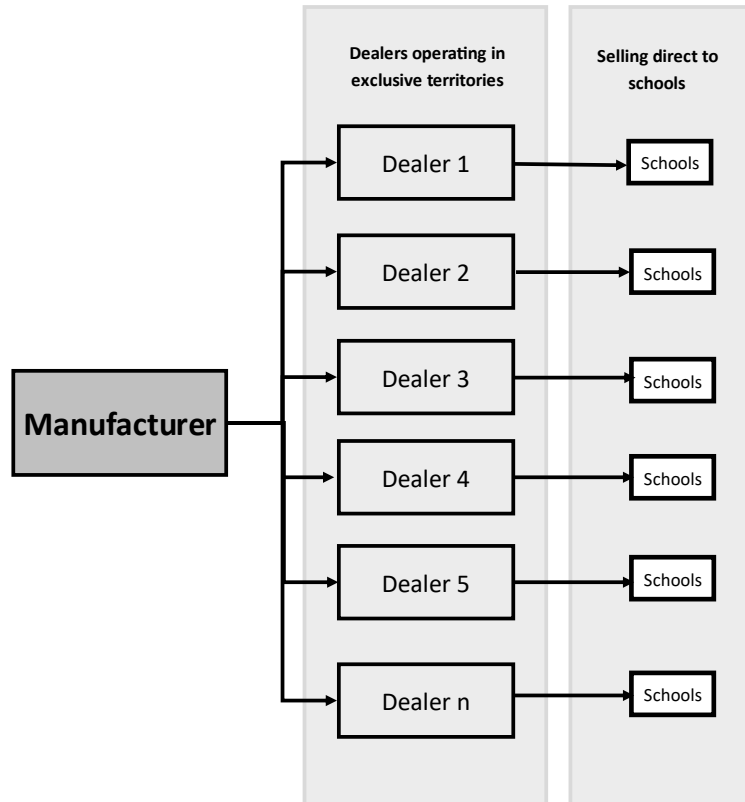


Figure 1-2 – Distribution model employed in this industry.

Due to the turbulent markets in which some of the case-study SMEs have to operate, the DCV is added as a component to the RBV. The suitability of the RBV combined with the KBV and boundary spanning is due to its consideration of external market factors in value creation, but also its focus on the internal working of the organisation and VRIO development.

The literature reviewed in this study looks primarily at the RBV literature but is supported by scholarship from the KBV, KAM and boundary spanning constructs. To support the research, the literature review progressed from the macro to the micro-level to focus on RDV Theory (with a dynamic capability component), boundary-spanning, and knowledge generation. By linking boundary-spanning activities with the managerial agency (in a KAM context) in SMEs, the study has identified significant areas of investigation in SMEs that have been, so far, neglected. The literature synthesis and research approach commenced first from a macro-view. Then to a micro-analysis before reverting back to a macro-conclusion of the ontological nature of dynamic capability stepping

back from the black-box and assuming an overall ontological stance. A summary of the macro to micro then to the macro approach is summarised in Figure 1.3.

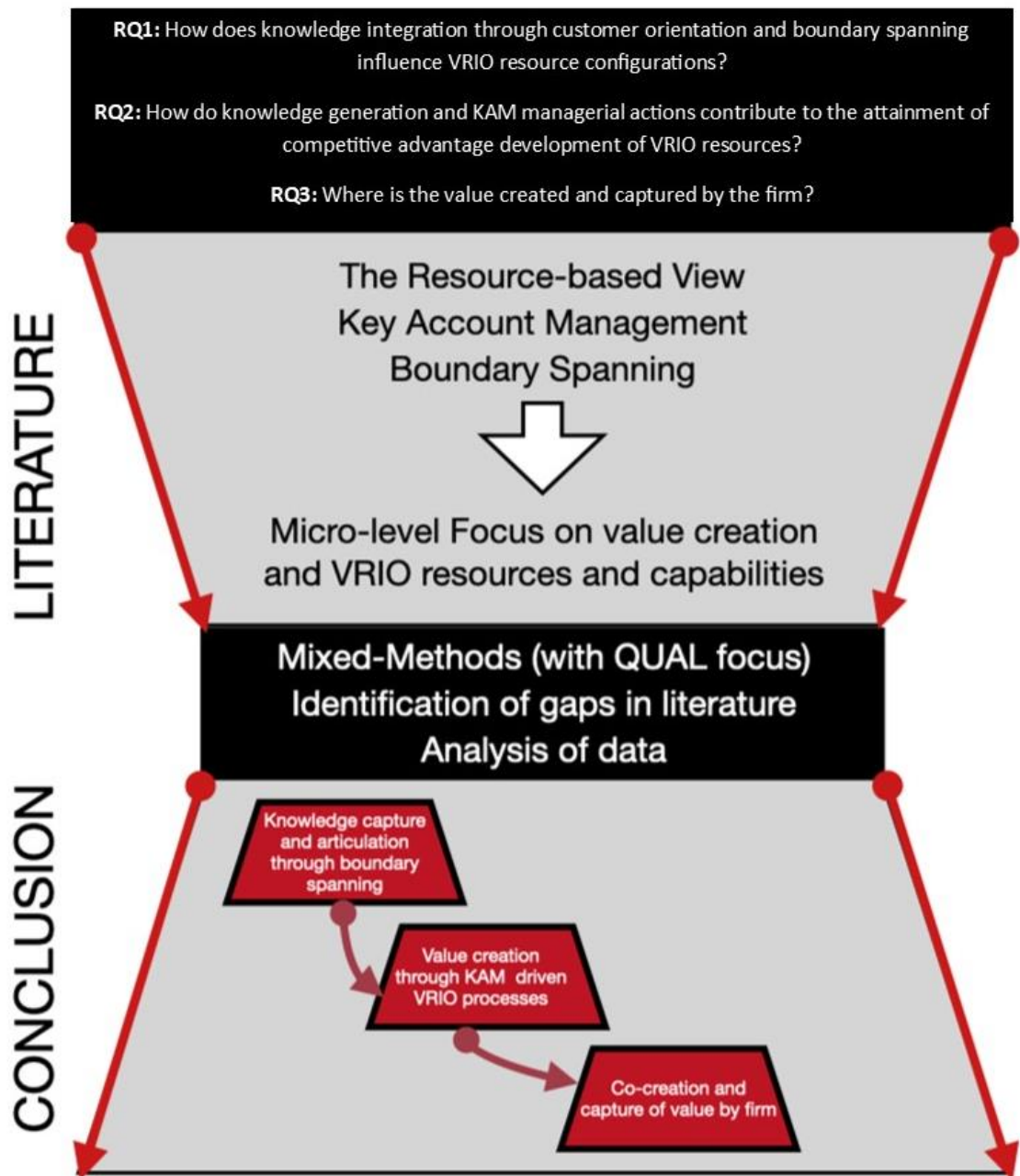


Figure 1-3 – Roadmap for the study

1.4 Theoretical and Practical Contribution

The review of the literature concluded that resource and capability building in SMEs had been largely ignored. This study makes significant contributions to the understanding of how VRIO resources in SMEs are developed and how the use of boundary agents can be leveraged in this regard. Contributions from the study are summarised in three key areas as follows:

- I. Theoretically, the concept of resource specification and value creation has been poorly defined in the literature. This could be significantly enhanced if the lack of attention afforded to the resource development at the micro-level of the SME can be addressed. The study offers a new perspective on resource and value co-creation in SMEs. The theoretical argument presented in this study is that there is a need for divergence away from reducing resources and capabilities into neatly packaged bundles to a more fine-grained approach in terms of their degree of specificity. In that regard, this study challenges the traditional view of the RBV. The research suggests that VRIO resource attributes should be viewed as overlapping human-level capabilities and firm level-resources as an interconnected unit(s) that are in a state of continuous flux.
- II. Third, the case-study approach involving SMEs and their customers across seven different cultural regions provided unique conceptualisations of how VRIO resource assets vary between the customer and the supplier in the different regions.
- III. The literature shows that boundary-spanning activities are an effective method to contribute and build a competitive advantage in the market. This study reaffirms that general view but illuminates in a more profound sense the relational nature of boundary spanning activities at the level of SMEs. Where boundary agents enjoy a higher level of integration in the SME, the opportunity to build and develop VRIO resources and capabilities is far greater. Where boundary agents are independently active and create a secondary level of boundary agents, a position of sustainable competitive advantage is achieved by the partner SME.
- IV. The development of VRIO resources in consultation with boundary agents provides a realistic opportunity for SMEs to attain and sustain competitive advantage by locking in the customer over an extended period.
- V. An evaluation of brand evangelistic customers to purposively go out of their way to promote a brand through word of mouth (WOM) marketing, along with 'petrol-heads' and tech-savvy customers who can also act as boundary spanners in some cases, and what effect they can have.
- VI. Finally, in engaging boundary agents who are former (or current) educators (science teachers in the context of this study), significant barriers are removed for a hesitant

customer to embrace new technologies. The targeting of all sales activities through the agency of in-situ workshops creates a relaxed atmosphere and encourages discussion between customers about the market and activities of rival firms. Thus, market intelligence is assimilated in an extremely cost-effective way and used to create important VRIO resources.

1.5 Thesis Overview

The thesis is organised into six chapters:

Chapter 1 provides an overview of the study and outlines the aim, objectives, and research questions. A context is provided in which to situate the research problem and the significance of the RBV paradigm in understanding the phenomenon of VRIO resource configurations that underpin competitive advantage in SMEs. This study is worth pursuing because of the lack of focus on SMEs in the RBV literature. Moreover, the conceptual underpinnings of the RBV theory are not easily understood by practising managers, and the utility of the theory is, therefore, diminished. Novelty is added through the integration of RBV, KAM, KBV and boundary spanning. Finally, the study has usefulness in that it highlights the focus on the unique challenges facing SMEs and the highly interrelated aspect of capability building at this level.

Chapter 2 reviews the literature and identifies RBV as an essential theoretical framework for the study of competitive advantage in small firms. Important VRIO resources are conceptualised in terms of their creation and co-creation through boundary spanning activities with the support of KAM capabilities. Knowledge assimilation and acquisition to understand the critical value-creating attributes values highly by customers is added to the literature mix. The Chapter starts with an overview of competitive advantage and its intellectual foundations (Day, 1994; Prahalad & Hamel, 1990). Next, customer value, efficiency, and sources of competitiveness and their linkages to the core competencies resident in the firm are then reviewed (Prahalad & Hamel, 1990). The Chapter identifies that one of the essential resources in small firms is its knowledge gathering capabilities (Grant & Verona, 2013). The construct known as KAM is introduced as a means to provide a bridge between knowledge management (KM) and the transfer of knowledge across the divide between customer and supplier through boundary-spanning activities. The KAM discussion is grounded in a customer focus context. It examines the specific traits that are necessary for an internal sales professional to support the activities of boundary spanners and to be effective conduits for information to management. The mechanisms and challenges of integrating knowledge will then conclude this Chapter with a discussion of the utility of boundary agents as an object of knowledge transfer across the boundary between the firm and the customer. In addition, evangelist customers can also be effective marketeers through WOM, or support of boundary spanning activities in

workshops or in the field. For SMEs who wish to compete with much larger and better resources rivals, there is a need to stand out and offer a value-laden product or service which costs much less to implement than the returns it will receive. Such a strategy is signature processes that are moulded and configured to best serve the requirements of the niche market in which the SME will often compete. The final summary will propose that supplementing the RBV and dynamic capability theory with knowledge integration using competent boundary agents will assist in filling a significant gap in the literature in our understanding of the utility and the ontological nature of micro-foundations in small firms.

Chapter 3 discusses the conceptual model that will guide the research. The conceptual model brings the constructs of the RBV, knowledge management, KAM and boundary spanning together in a single framework. The Chapter frames the core focus of the research to determine the critical VRIO resources required by the firm to succeed in this market in the context of data-logging usage in schools. In the identification of the critical VRIO resources, a conclusion can then be sought as to why one SME can be more successful than another.

Chapter 4 explores the philosophical basis for the research methodologies used. It discusses the multiple case-study approaches in the research and the suitability of an interpretivist philosophical paradigm. The chapter explains the epistemological and ontological perspectives and why they were chosen. The resulting influence over the selected design and methodology used is also critically discussed and justified. The sequence and methods of data collection are critically reviewed, and the relevant tests of validity used in both quantitative and qualitative phases are explored and justified.

Chapter 5 presents the data collected from the qualitative study used NVivo (V10) to illustrate the critical factors of success and competitive advantage from the firm's points of view. Using RBV Theory combined with knowledge management, KAM and boundary spanning, a clearer picture delineates the conditions that influence the development of VRIO resources leading to competitive advantage in the multi-case-study survey of 13 SMEs in the science education market.

Chapter 6 offers a discussion of the findings of the existing literature and theory surrounding dynamic capabilities, knowledge management and boundary spanning. Each of the RQs and supporting hypothesis are discussed in sequence, and a revised conceptual model is then presented. Conclusions are drawn on the ontological interpretation of value and its relationship with attaining and sustaining, competitive advantage.

Chapter 7 provides summaries and discussions of the findings and formulates a conclusion in light of the research aim and objectives. The chapter concludes with a discussion of the limitations of the study and possible areas of research that would complement further the understanding of the

foundations of VRIO resources and SMEs and the gaps in the body of scholarship in this important field.

2 Literature review

2.1 Introduction

This chapter describes the key literature of relevance to the study. It critically reviews the Resource-Based View (RBV) of strategic management and the emergence of the concept of ‘dynamic capability’ from an organisational learning perspective through the agency of boundary-spanning activities. This chapter will build around the key aim of the study which is to determine how and why specific VRIO resources and capabilities are critical to the competitive success in the case-study SMEs.

As part of that aim, it is necessary to understand how VRIO resources and where applicable, dynamic capabilities, are developed. The literature review builds on key themes of the RBV, knowledge capabilities, boundary spanning and key account management (KAM) to guide the research through three qualitative guided research questions:

- RQ1: How does knowledge integration through customer orientation and boundary spanning influence VRIO resource configurations?
- RQ2: How do knowledge generation and KAM managerial actions contribute to the attainment of competitive advantage development of VRIO resources?
- RQ3: Where is the value created and captured by the firm?

The literature within the strategic management paradigm divides between opposing views that competitive advantage is attained either by looking at the firm’s competitive environment, by taking a game theory approach, or by looking inwardly at the dynamic capabilities within the firm. The first draws on a managerial aspect of organisational economics through the much-heralded *Five Forces* framework (Porter, 1980, p. 624). The second borrows from game theory in a strategic conflict approach against rivals (Shapiro, 1989). The third stream is based on a scarcity-based approach (Kay, Leih, & Teece, 2018) analysing firm-specific capabilities and assets including the resource-based and dynamic capability views (Mahoney, 2001; Penrose, 1959; Rugman & Verbeke, 2002; Rumelt, 1984; Wernerfelt, 1984, 1995).

While each of the three approaches share common ground in areas such as market entry (or exit), firm efficiencies, imitability and the concept of firm-level heterogeneity, the Resource-based View (RBV) and dynamic capabilities framework provides an opportunity to delve deeper into the firm. RBV is an approach that explains how competitive advantage can be achieved that first appeared in 1980s and 1990s, after the major works published by Wernerfelt (1984) (“The Resource-Based View of the Firm”), Prahalad and Hamel (1990) (“The Core Competence of The Corporation”), Barney (1986) (“Firm resources and sustained competitive advantage”) and others. The supporters of this

view argue that organisations should look inside the company to find the sources of competitive advantage instead of looking at a competitive environment for it.

The concept of dynamic capabilities arose from perceived shortcoming of the RBV in that it was considered 'too static' (Teece, Pisano & Sheun, 1994). The RBV has been criticised for its deficiency in not acknowledging that resources are, in turn, supported by other (often invisible) lesser resources. Instead RBV theory assumes that they simply must "exist" somewhere (Fallon-Byrne, 2013). This as led to an under-explored area of the RBV literature where there is still a lack of understanding as to how resources are deployed, developed and integrated within the firm and how they create and return value to the firm. Dynamic capability theory attempts to address these deficiencies by adopting a more process-based approach. The micro-foundational view of sensing, seizing and reconfiguring acts as a mediator between the firm's resources and the environment. Hence, in a rapidly changing environment, the dynamic capability view helps explain how and why a firm can adjust its resources and capabilities to either achieve, or maintain competitive advantage. The theory suggests that competitive advantage can be rapidly eroded unless there is a close attention to dynamic change (Ambrosini & Bowman, 2009) So, while the RBV emphasises resource choice or the selecting of appropriate resources, dynamic capabilities emphasise resource development and renewal. The commonly used definition of a dynamic capability is still widely accepted as posited by Teece et al. (1997) who defined dynamic capabilities as '*...the ability to integrate, build, and re-configure internal and external competencies to address rapidly-changing environments*'.

The following discussion will examine why the RBV and, to a lesser extent, dynamic capabilities have special importance in strategy and their particular relevance to this research. Focusing on internal **Valuable, Rare, Imperfectly Imitable, Organisational** (VRIO) resources and capabilities can support a more sustainable competitive advantage over a longer period than the product or market focussed approach. However, there is still a place for consideration of the external environment and from Porter, and both the internal and external views can compliment each other. As we shall see, the RBV of the firm is an important field of strategic management in the understanding of how the creation of competitive advantage can inspire new related fields such as the DCV and the KBV.

Dynamic capability theory facilitates closer scrutiny of foundations that contribute to the unique capabilities in the SME down to the level of the individual worker, and as such, can be a complimentary bedfellow of the RBV. Dynamic capability theory positions the manager/owner/entrepreneur, firm dynamics and tacit know-how centre stage in times of significant market turbulence (Kay et al., 2018). The evolution of the dynamic capability framework led to the conceptualisation of 'micro foundations' clustering together inside the 'black box' of the firm as a means to get to the heart of what 'scaffolds' competitive advantage (Teece, 2007). The framework thus facilitates a micro- or focused approach to evaluating the capability building foundations in

small to medium-sized enterprises (SMEs). The elusive black box can also be a lens through which VRIO resources can be assessed along with the capabilities it was designed to explicate.

Section 2.3 looks at the RBV to determine their applicability as a suitable framework for understanding competitive advantage in firms. The core theoretical ideas of the construct are discussed (2.3.1) and then the connection with the functional interpretations of dynamic capabilities in the literature (2.3.2). Following on from this discussion, a classification of dynamic capabilities follows (2.3.6) leading into current conceptualisations on hierarchical classifications of the paradigm. The ultimate goal of developing or re-configuring dynamic capabilities is to attain or sustain a competitive advantage against rivals, with this concept being introduced in 2.3.6. Path dependency and the constant need for renewal of capabilities attempts to position them in terms of the importance and hierarchical nature in the organisation (2.3.7). In considering the preceding discussions, the limitations of dynamic capability are outlined in 2.3.7 and then follows with a critical analysis of the notable deficiency in empirical research in the context of SMEs. The sub-section concludes with a discussion of competitive advantage, and its relevance to dynamic capability (2.3.9) then concludes with an argument proposing the need for a new approach for the study of SMEs (2.3.10)

Section 2.4 introduces the KBV and suggests that the knowledge created in the organisation should be considered a valuable asset. The nature of knowledge and its relationship with dynamic capability is proposed in sub-section 2.4.1 and leads on to how knowledge can generate through experiential learning (2.4.3). Building on experiential learning, the concept of knowledge flow across organisational boundaries proposes a new viewpoint complimenting organisational learning (2.4.5). The generality of boundary spanning is brought more into focus with a discussion of knowledge transfer at the individual level through boundary agents (2.4.6). The methods of how knowledge transfers across boundaries, mechanisms of factors of knowledge communication follow in 2.4.6. Then, taxonomies to categorise both boundary-spanning activities (2.4.6) and different forms of knowledge (2.4.9) follows. Finally, a summary of what knowledge creation and integration involve closes the discussion on the knowledge-based view (2.4.10).

Section 2.5 introduces the area of key account management (KAM). The rationale for the introduction of KAM is because the literature on sales management has identified specific character traits and personalities that are more successful in the area of technical sales. Section (2.5.1) starts by moulding the KAM, KBV and the RBV together to find common ground at the nexus of which the contributions of boundary spanners can be contextualised. A mechanism that can facilitate knowledge through boundary spanning is discussed in the interface between customer and supplier is presented in 2.5.2. The importance of a strong customer focus is evoked in 2.5.3, and the changing requirements of sales professionals where technical knowledge is required to complement the

activities of boundary spanning activities are elucidated. The section continues in 2.5.4 with customer centricity and a review from the literature on the elusive question of ‘value’.

Finally, in 2.6, the gaps in research in the areas of the RBV are disaggregated into two sections. First, the section addresses the lack of scholarship in RBV theory in SMEs, and second, deficiencies in the literature regarding boundary spanning at the level of the individual worker in SMEs. Finally, the lack of clarity around what is a resource or what is regarded as ‘value’, form the conclusion to the findings of the literature review. Accordingly, these significant gaps assisted in the formulation of the three research questions described earlier.

2.1.1 The SME – A Definition

The definition of the SME in this study follows the European Union (EU) recommendation 2003/361. The two criteria in determining whether an enterprise is classified as an SME are headcount (employees), and either turnover (sales volume) or balance sheet. Table 2.1 following impose ceilings that apply for individual firms only (Communities, 2003). A firm that is part of a larger group may need to include staff headcount/turnover/balance sheet data from that group as well. SMEs represent 99% of all businesses in the EU.

Table 2-1 SME recommended limits from EU.

Company category	Staff headcount	Turnover	or	Balance sheet total
Medium-sized	< 250	≤ € 50 m		≤ € 43 m
Small	< 50	≤ € 10 m		≤ € 10 m
Micro	< 10	≤ € 2 m		≤ € 2 m

2.2 The Resource-based View of Strategy

2.2.1 Introduction

In 1984, Birger Wernerfelt first coined the idea that the Resource-Based View (RBV) could be regarded as a theory that connects the valuable tangible and intangible resources in the firm, the bundling together to create a competitive advantage. The RBV has developed into an influential theory has become the basis of several frameworks, most notably in accessing resources that can confer competitive advantage.

According to Wernerfelt’s theory, a firm or organisation is a bundle of resources. Firms differ depending on what these resources are and how they are combined. Resources include *inter alia* processes, capabilities, assets, attributes, information, and knowledge. Together, they allow firms to execute their relevant activities. However, not all resources of a firm are equally and strategically

appropriate. Specific resources give the firm a competitive advantage, while others do not. Those that give rise to competitive advantage have particular characteristics. The first of two frameworks are the VRIN – which describes resources that are valuable, rare, hard to imitate and non-substitutable (VRIN). An improved version of the framework replaces the ‘non-substitutable’ resources with the ‘organisation’ of the resources (VRIO). The suitability of the VRIO model is that it extends the analysis to the firm’s larger strategic scheme. The study prefers the later VRIO model because it deals with the organisation of the resources collectively as a basis on which to measure competitive advantage. Since, in SMEs, resources are usually bundled together to complete specific tasks, the VRIO is deemed a more suitable framework.

The managerial RBV framework is used to determine how a firm can achieve a sustainable competitive advantage through the exploitation of its strategic resources. “...The RBV as a basis for the competitive advantage of a firm lies primarily in the application of a bundle of valuable tangible or intangible resources at the firm’s disposal...” (Wernerfelt, 1984b, p. 1). In order to turn a temporary competitive advantage into one that is a sustained competitive advantage over a longer term requires that these resources be heterogeneous and not perfectly mobile (Barney & Peteraf, 2014; Peteraf, 1993). Effectively, this translates into valuable resources that are neither perfectly imitable nor substitutable without great effort (Barney, 1991). If a longer term competitive can be maintained, the bundle of resources that are heterogeneous and not perfectly mobile can sustain the firm’s above-average returns. There is strong empirical evidence in the literature to support the RBV as a suitable framework to assess competitive advantage (Crook, Ketchen Jr, Combs, & Todd, 2008).

Wernerfelt (1984a) introduced the notion of the RBV as a basis to explain the competitive advantage of a firm over its rivals primarily through the application of a bundle of valuable resources (tangible or intangible) in the firm. RBV has developed into an influential theory with underpinning frameworks first as the VRIN, and later as the VRIO frameworks (discussed in more detail later). Barney’s 1991 article “Firm Resources and Sustained Competitive Advantage” is widely cited as a seminal contribution in the emergence of the RBV (Barney, 1991). RBV builds on the assumptions that strategic resources are heterogeneously distributed across firms and that these differences are stable over time. Thus, RBV provides a link between resources and sustained competitive advantage through the lens of four (VRIO) empirical indicators. The indicators explored by Barney (1991) centred on the firm’s ability to generate resources examining value, rareness, imitability, and organisation of resources to generate sustained competitive advantage.

Wernerfelt’s (ibid) view was that a firm is a bundle of resources, and they differ depending on what these resources are and how they are combined. The bundles of resources combine to create activities that allow the firm to function in specific ways. For this study, the definition of resources will include but are not limited to processes, capabilities, assets, attributes, information, and knowledge. Thus,

RBV is this a theory that focuses attention on the specific internal resources to identify those capabilities, competencies, and the firm's assets (tangible and intangible), that have the potential to deliver superior competitive advantage compared to rivals.

2.2.2 The Organisation and RBV

According to Thompson (1967, p. 51), the "...major components of a complex organisation are determined by the design of that organisation..." Thompson argues that the major components of the complexity of the organisational structure are further "...segmented, or departmentalised, and connections are established within and between departments..." (p.51). In essence, Thompson is alluding to a 'structure' scaffolding the organisation composed of the different patterns and relationships within and between the departmentalised segments. Modern organisations of any size are reliant on technologies to manage their finances, support marketing and key account management practices, and manage and share tacit knowledge.

Thompson's work is important to consider for this study because he offers a broad view of the many disparate activities in an organisation that can contribute to its overall success. Despite his book being published in 1967, Thompson elucidates many of the constructs discussed in this study as being integral to the organisation as a whole. Thompson's book is often cited as a seminal work in the creation of contingency theory and the first part of his book focuses on the structure of the organisation as being contingent. Contingency theory suggests that, for organisations attempting to act rationally, the optimal structure will be highly contingent on many factors. This view resonates with the SME, where the rationality of decision making is key to its survival. The more accurate that decision making can be, the more likely that the resources are configured as VRIO resources, the more the benefit to the SME. The second part of the book on human factors has been less influential in the organisational literature. However, Thompson does refer to boundary spanning as a source of important knowledge. In essence, Thompson's work makes explicit how organisations can be "broken down" into small sub-units and components which can be analysed and theorised to avoid uncertainty.

The social structure and fabric of the firm will be composed of human and non-human resources and those that are tangible and intangible. Thompson (1967) suggests that the structure of the firm should be considered in terms of a 'socio-technical system', where resources are created with a view to competitive advantage through 'instrumental rationality'. The term 'instrumental rationality' used by Thompson, is employed to explain ways in which workers engage, make decisions, and reasons to work collectively to achieve a necessary goal. Parallels between Thompson's theories and the locus of the RBV theory emerge. For example, the RBV is concerned with looking inwards inside the firm to explore, select and combine the resources and combine them to exploit best the external opportunities, which necessarily required that instrumental rationality is present in the firm.

The importance of a coherent approach by management is to avoid the firm becoming ‘synthetic’. This is because there is a real danger that the firm can develop random and aimless behaviours that are focused on opportunism (Thompson, 1967). A ‘synthetic’ firm emerges in an ad-hoc way in response to a disaster or a new opportunity. Rather than being a sporadic opportunity seeker, the ‘instrumentally rational’ firms tend to get the job done over the longer term than their synthetic rivals.

The instrumentally rational firm requires that key knowledge is shared and made available to workers. Several factors affect the limits placed on workers to carry out the task. For example, the amount of information they must complete a task, the limit of their training, the cognitive limitations of their minds, and the time they have to decide on the task. This is known as ‘bounded rationality’; that is, workers are bounded by the limits placed on them.

If instrumental rationality provides the intellectual, procedural, and technological tools that appear to be impersonal, then value rationality provides the moral rules that bring the emotionally satisfying aspect to the worker’s actions. Every firm maintains itself by striking a balance between the instrumental with value rationale to achieve the goals and ambitions set by management. In unison, they make workers rational, and hence the firm, in their decisions and how they go about their tasks.

The works of Thompson (1967) provides some substance on which to journey through a research study guided by a Resource-Based View of the firm ontologically and epistemologically. Thompson (1967) adds flesh to the bones of the impersonal concepts of ‘resources’, ‘capabilities’ and ‘value’. Value rationality through human inputs fundamentally underpins the culture and the co-creation of value inside and outside the firm, if instrumental rationality provides the moral rules that bring emotional satisfaction to the workers. Having established that the human element is pivotal to the creation and orchestration of resources, the managerial structure is now discussed.

2.2.3 The RBV and Strategic Management

To review the literature surrounding the RBV in organisations, a brief overview of what constitutes strategic management is a logical starting point. The concept of ‘strategy’ has been around a long time, with business strategy owing much to the military strategy developed over thousands of years and now used freely by managers (Mintzberg et al., 2009). Strategy has been defined as the “...match an organisation makes between its internal resources and skills...and the opportunities and risks created by its external environment...” (Hofer et al., 1978).

Over the past thirty years, frameworks that embraced an internal and external analysis of firms emerged. The external analysis stream was championed by Michael Porter, who took an economics-based view of aspects of strategic thinking and decision-making. He developed some popular theories and models from this perspective (Gibbons et al., 2015, p. 23). It is not a part of this research to look in detail at Porter’s theories and models or critique them, but one, in particular, is essential to this

study: the concept of 'Competitive Advantage'. Michael Porter (1985) defines competitive advantage as being derived if a firm can create superior value for customers by offering lower prices than competitors for the same products or providing unique products (or services) that a buyer is willing to pay for at a premium price. Thus, the implication is that, somehow, competitive advantage is correlated with added value. Despite the popularity, universal agreement in the literature, a clear definition of competitive advantage remains unclear (Klein, 2001). The confusion in the literature about how competitive advantage has been attained has led to charges of tautology as to how firms can achieve success. Klein (2001) suggests that firms that achieve a high level of success can credit the success strategies they have in place aligned with developing competitive advantage.

Perhaps the answer to the competitive advantage conundrum might lie in a separation of the competition from strategy and view it as a distinct but complementary ontology. However, in response to this conflict, and direct opposition to the approach by Porter (1980), was an alternative view that concentrated on the internal resource endowments of the firm as the primary factor of competitive advantage.

The resource endowment approach was initially championed by economist Edith Penrose in 1959, focusing on endogenous company growth through "knowledge-based-learning slack resources". Penrose suggested that the internal resources of the organisations is the source of competitive advantage for the firm. Resources that are knowledge generating, added value creators, innovation sources are particularly associated with competitive advantage generation. Penrose stresses the important role played by managers in the growth of firms. Penrose saw the external environment as an "image" in the minds of managers (Klein, 2001; Pitelis & Teece, 2010). Scholarship had evolved in the 1980s to recognise the importance of internal resources and capabilities because of three main factors:

- growth of more high-velocity exogenous environments that required different interpretations of how a firm can react more rapidly;
- industry attractiveness was not the primary source of profitability; and,
- customer preferences are now changing much more rapidly because and the rate of technological change.

The term 'Resource-Based View' was coined much later by Wernerfelt, in 1984, viewing the firm as "...a bundle of assets or resources which are tied semi-permanently to the firm..." (Wang, 2013, p. 13). Progress over the following twenty years saw the emergence of contributions by Barney (1991), Mahoney & Pandian (1992), and Peteraf (1993). The notion of core competencies followed, focussing on resources the firm had that were superior to their competitors, and hence attain competitive advantage (Prahalad & Hamel, 1990). The strategic importance in terms of competitive advantage is that the notion of a firm being 'very good' in specific ways could set them apart from its rivals. The RBV attempts a more detailed disaggregation of what form and function such core

competencies should take. The literature in strategic management has evolved to achieve explanations for competitive advantage and the foundations that support it.

2.3 RBV and Competitive Advantage

2.3.1 Definitions of Competitive Advantage

Economists such as Penrose (1959) and Ansoff (1965) referred to the concept of competitive advantage before Porter (1980, 1985a, 1996; 2008). Penrose (1959) viewed the combination of the firm's competencies and resources as intimately associated with achieving rents (returns over a resource owner's opportunity costs). Penrose (1959, p. 54) is clear when making it explicit that superior resources are not enough on their own and because the '...firm's competencies involve knowing its resources and making better use of its resources...' than its rivals. Thus, Penrose (1959) recognises the importance of knowledge in the firm, or as Spender (1994, p.3) eloquently describes:

"...not only is the firm a repository of productive knowledge, but it is also an institution that develops and manages this knowledge and that the two processes of developing and managing knowledge may be hard to separate, both in practice and conceptually..."

Penrose (1959) also emphasises the need for change to maintain a competitive advantage:

"...The continual change in the productive services and knowledge within a firm along with the continual change in external circumstances present the firm with a continually changing productive opportunity..." (1959, p. 150).

Therefore, to qualify the importance of tacit knowledge in the firm, it must also be used productively. Still, it must be used in a "...continuous search and selection process to upgrade its technological and organisational knowledge, and thereby improves its likelihood of superior performance..." (Kor & Mahoney, 2000, p. 119). So, the sources of competitive advantage, according to Penrose (1959) resides inside the firm in developing superior resources that are used more productively, through superior knowledge of its managers, than its rivals.

Porter (1990) defines competitiveness in terms of three levels. The firm itself, the industry in which it operates and at the superordinate national level. Measures of competitiveness at the firm level include the firm's profitability, exports, and market share. Measures of competitiveness at the industry level include the firms' profitability, the industry's trade balance, and the balance of outbound and inbound foreign direct investment. Thus, Porter (1980, 1985a, 1985b) conceptualises competitive advantage in terms of a firm's positioning within a chosen industry. Competitive advantage means having either having lower costs than rivals, or a differentiation strategy, or a narrowly focussed niche strategy.

Barney (1991) views a competitive advantage as the situation when a firm "...is implementing a value-creating strategy not simultaneously implemented by a large number of other firms..." (p102). While definitions about competitive advantage abound, a precise definition remains elusive in the strategic management scholarship (Rothaermel (2016, p. 113). The common denominator in the use of the term competitive advantage is 'value creation'. As the following summary demonstrates, there is not much agreement on what is the precise meaning of value and to whom and when it refers (Rumelt, 1991). Longenecker et al. (2013) put it in simple terms that competitive advantage is a benefit for a company that has a product or service seen by the target market better than its competitors. Moreover, Longenecker et al. (2003) also emphasise that competitive advantage has a basis in the form of unique services, price, right products, consumer experience, and consumer convenience. Competitive advantage, therefore, can be used in the context of product excellence, operational excellence, and proximity to consumers.

Perhaps the most succinct definition comes from Barney and Hesterly (2010, p. 30), who characterise competitive advantage for a firm "...when it can create more economic value than rival firms..." In qualifying their definition of competitive advantage, 'economic value' is defined as "...simply the difference between the perceived benefits gained by a customer that purchases a firm's products or services and the full economic cost of these products or services..." Accordingly, the size of the economic value gap between rival firms is proportional to the size of competitive advantage in terms of cost.

These are deceptively simple definitions because the concepts are not always easy to measure directly. This is because the costs incurred to develop resources that lead to competitive advantage are not always easy to measure. In the SME, for example, the resource endowments may originate from several different areas within the firm. Barney and Hesterly (2010) suggest two approaches: (i) estimate a firm's competitive advantage by examining its accounting performance; and the second that examines the firm's economic performance (p.33).

2.3.2 Different Approaches to Competitive Advantage

The purpose of this study is to explore how an SME can create resources that are valuable, rare, costly to imitate by rivals, and then be organised (VRIO endowed resources) in such a way as to lead the firm to competitive advantage. A short discussion of the different views of competitive advantage in the literature is timely at this point.

The brief discussion that follows presents interpretations of competitive advantage from both strategic management and sales management and marketing management. While the focus of this study is on the creation of VRIO resources as a source of competitive advantage, interpretations from other streams of literature can only but help.

According to Porter (1980), competitive advantage can be achieved through a price leadership strategy, or a differentiated approach, or a careful focus on doing things right as part of a focussed strategy. In essence, Porter (1980, p. 3) suggests that competitive advantage can be sustained if the value captured by the firm exceeds the firm's costs in creating that value for the customer. Peteraf (1993) defines competitive advantage as that brings "sustained above-normal returns." In a similar vein, Peteraf refers to "imperfectly mobile resources" that are heterogeneous to the firm that is not easily replicated by rivals. In such instances, the resources can be a source of competitive advantage. In essence, if the resources are applied to the most profitable opportunities, such that they cannot be more profitably deployed elsewhere, the firm is using its resources to maximum effect. Barney (2002, p. 9) asserts that competitive advantage is attained in a firm when "...its actions in an industry or market create economic value and when few competing firms are engaging in similar actions." Barney is, in effect, aligning the idea of competitive advantage to the judicious use of resources focussed on creating a superior performance for the industry and thereby returned higher than average profits.

Prahalad and Hamel (1990) focus on the resources, capabilities, and competencies of the organisation as the source of competitive advantage rather than the environment, as in the traditional approach. Besanko, Dranove, and Shanley (2000, p. 389) similarly define competitive advantage as being able to achieve a superior "...economic profit than the average rate of economic profit of other firms competing within the same market..." Their definition of economic profit is not too dissimilar to that of Peteraf (1993) where it is defined as the profit gained by investing in an activity that produces competitive advantage compared to the next best opportunistic activity.

Another view, expressed by Saloner, Shepard, and Podolny (2001), is a competitive advantage can be regarded where a firm can deliver a product valued more by the customer than any equivalent product by its rivals. However, this can just be a sustainable competitive advantage if the firm can only thrive if it can capture the value, it has created over and above the cost of creating it.

Kay (1993) adds to the debate by suggesting that distinctive capabilities are a source of competitive advantage. Thus, distinct capabilities are derived from heterogeneous resources and routines that are also sustainable and appropriable and not available to rivals. If applied correctly, therefore, "...A distinctive capability becomes a competitive advantage when it is applied in an industry or brought to a market..." (Kay, 1992, p.14). Thus, firms that possess distinctive capabilities have attributes others cannot replicate even after they understand the inherent benefit that they bring to the firm that owns them. The business thus derives its competitive advantage from the distinct structure with employees, customers and suppliers, where the continuity and stability of these relationships are essential. Kay (1993) also stresses that these relationships are essential for flexibility in the face of change. In his later work, Kay proposed his *Distinctive Capabilities Framework* (1995), where

distinctive capabilities fall into one of three categories: reputation, architecture and innovation. The Kay framework has distinct similarities to the RBV, for example, where “architecture” is the organisation in VRIO. The framework also has interesting interpretations that could supplement the RBV. The scarcity of assets is a characteristic of SMEs. It is often cited as the biggest challenge to their remaining in the market, let alone, seeking a position of competitive advantage. A key part of this study is the attainment of competitive advantage in SMEs, and so the review now examines the extant literature in this area.

In summary, to take elements from each of the different interpretations of competitive advantage, the firm could have to enjoy superior rents than its rivals, have a product or service that offers superior value and cannot easily be copied or substituted. Moreover, value-added resources can also be derived from the stability of employees, customers and suppliers that work well together. Competitive advantage can be reinforced further if customers value the firm’s reputation, organisational architecture, and innovation (Apple Inc as an example). The above discussions across the three different literature streams (strategy, sales and marketing) are all generalised conceptions of competitive advantage in larger firms. The case of the SME is somewhat different, and there is a deficiency in the literature addressing precisely what competitive advantage means in an SME.

Porter, like most other writers on corporate strategy, concentrates his attention on larger corporations that are multidivisional rather than SMEs. The critical distinction between the firms that are the focus of Porter and others and the one that will form the basis of this study is that SMEs do not have multidivisional structures. The SMEs, instead, have a small team that is responsible for a wide range of operational and functional activities. Klein (2001) suggests that Porter’s attempts to define ‘competitive advantage’ are tautological because the concept is simply equated with a ‘firm’s performance in competitive markets’ (Porter, 1985, p. xv). While Porter (1985) and Ansoff (1965) have tried to establish corporate strategy as a doctrine, others such as Mintzberg (1978); Mintzberg, Ahlstrand, and Lampel (2009); Mintzberg and Waters (1985), and Pettigrew (1987, 2012) have looked inward to the firm for similar answers. That discussion now continues with an evaluation of the VRIO resources that are central to the RBV theory and competitive advantage.

2.3.3 The VRIN/O Frameworks

For reasons given earlier, the preference of the VRIO over the VRIN models will be adopted in the study. However, a short discussion of both models is helpful and also relevant.

Although having heterogeneous and immobile resources is critical in achieving a competitive advantage, it is not enough alone if the firm wants to sustain it. Barney (1991) has identified the VRIN framework that examines if resources are valuable, rare, costly to imitate and non-substitutable. Specific resources give the company a competitive advantage, however not all

resources have a strategic importance. These have the VRIN (or later the VRIO framework that will be discussed later) characteristics, which can be discovered by focusing on four fundamental characteristics:

1. **Valuable** – Valuable resources are those that can deliver a competitive advantage to the firm. The VRIN framework posits that valuable resources to the firm can underpin competitive advantage by being superior to their rivals in terms of generating superior profits. If the firm is able to deploy its resources in a more profitable way than its rivals, higher profitability can be achieved that can be a basis of competitive advantage. The challenge to business leaders is to correctly identify, develop and use the resources such that they can maximise the return of capital employed.
2. **Rare** – Resources that cannot easily be obtained on factor markets. Furthermore, rare resources possessed by one or only a small number of firms are also considered rare. Rare resources can be tangible or intangible and can be a source of competitive advantage even though rivals may possess resources that are considered valuable in the market (Barney, 1991)
3. **Inimitable** – Building on valuable and rare resources, Barney (1991) concedes that competitive advantage is predicated on the difficulty for others to imitate these resources. Barney (1991, p. 107) refers to the condition of being “imperfectly imitable” because they are either casually ambiguous or highly complex to reconstruct. Where resources have a high degree of interdependence and are developed over time, likely, managers working in the firm could not replicate the unique resources required to do so.
4. **Non-substitutable** – The final qualifying condition is that there are no other means by which a valuable resource can gain a competitive advantage. If resources are different but strategically similar, two firms could compete using different resources to seek a competitive advantage using different strategies. In this case, no firm can achieve a sustained competitive advantage as long as the substitute resources created value for the customer and captured value back to the firm.

The resources and capabilities that answer yes to all the questions posed by VRIN are the resources that will provide a sustained competitive advantage. The idea of a firm-specific (or signature) process is highly valued by the customer and is distinct and different from any other process in any rival firm. The customer is willing to pay more. For a firm to command a higher price than its rivals very often means that they enjoy some level of competitive advantage.

While the VRIN (or later VRIO iteration) characteristics above are all important and necessary, but they may not be sufficient for a sustained competitive advantage (Dierickx & Cool, 1989a; Priem & Butler, 2001b). Within the framework of the RBV, the chain is as strong as its weakest link and,

therefore, requires the firm's resource to possess each of the four characteristics to confer sustainable competitive advantage (Barney, 1991). Hence, it is not that each resource must possess the four basic characteristics, it is how they are organised and deployed that provides the source of competitive advantage

Thus, the concept of competitive advantage presents some ontological difficulties when trying to ascertain *ex-ante* when the path dependency is somewhat unclear. In response to this, the framework was later improved from VRIN to VRIO by adding the following question: "Is a company organized to exploit these resources?" Barney (1991) evolved the VRIN framework to VRIO, giving us a complete framework. The change of the last letter of the acronym refers to the so-called question of "organization", which is the ability to exploit the resource or capability. Barney realised that the business must also be ready and able to utilise its resources to capitalise on its value. A resource that meets each of these four criteria above can bring about a competitive advantage to the business. The VRIO framework is particularly useful for assessing and analysing a SMEs internal resources and its potential for applying these resources to achieve competitive advantage. The VRIO offering a complete evaluation of the resources within the SME is, therefore, the preferred framework on which this study will focus.

A VRIO framework adopted from Rothaermel (2016, p. 113) shown in Figure 2.1. The framework demonstrated the relative importance of the valuable, rare costly to imitate resource. Still, unless the firm is organised to capture the value from the market, no sustainable competitive advantage is possible. In the case of VRIO, the 'O' now means the organisation as a whole. To evaluate the competitive position of the SME in terms of the VRIO framework, Figure 2.1 provides a logical methodology to guide the assessment of resources within an SME.

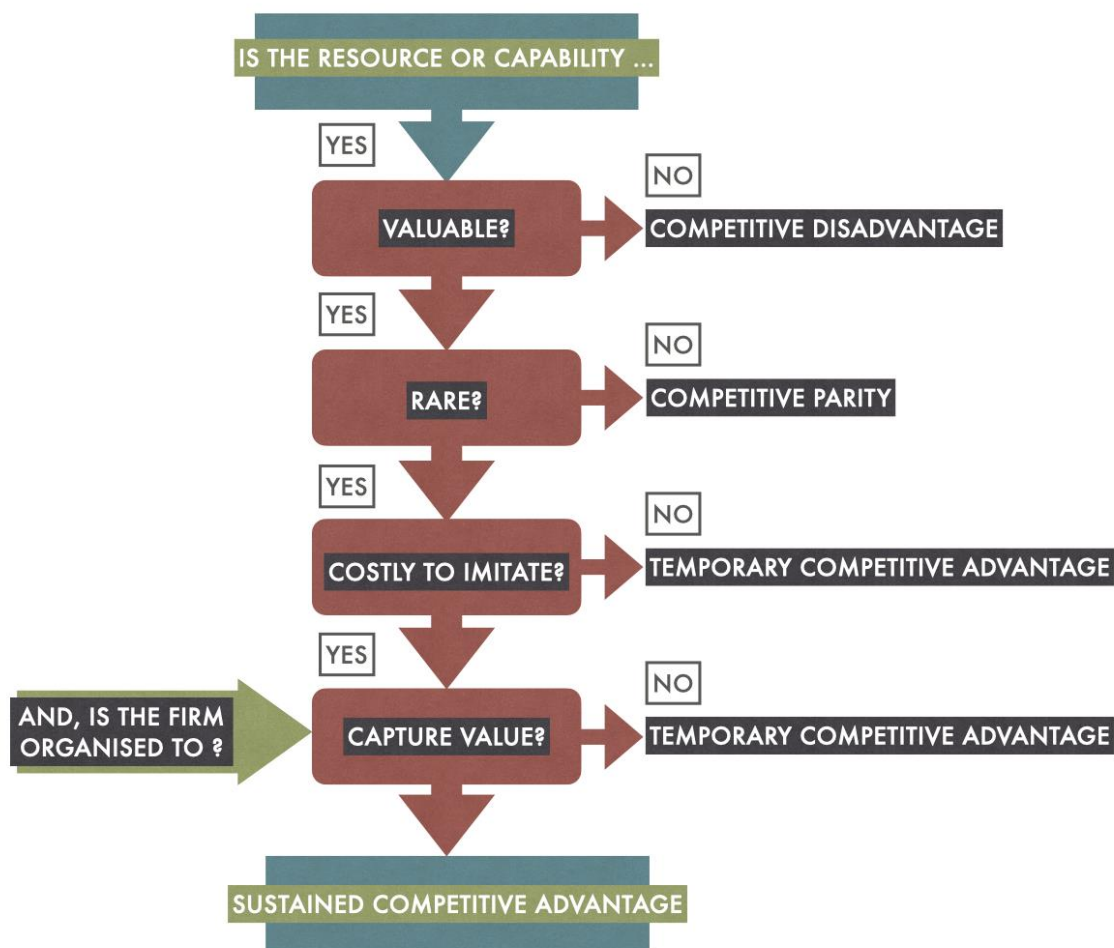


Figure 2-1 - VRIO evaluation framework from Rothaermel (2016, p. 113).

The RBV draws attention to the internal environment of the firm and seeks to determine a competitive advantage from those internal resources that have developed over time to compete in the firm's environment (Wang, 2013). It can also be described as a tool for business management, which can be used to determine the strategic resources that a company may possess and are at its disposal. The bundles of resources within the firm can combine to become a source of competitive advantage, if they are valuable, heterogeneous, and not perfectly mobile (Wernerfeld, 1984; Rumelt, 1984; Peteraf, 1993). To qualify as heterogeneous resources and capabilities that are unique, and to be a source of sustained competitive advantage, they must satisfy the following VRIN conditions, according to Hoopes, Madsen, & Walker (2003, p. 890) as stated earlier.

In the VRIN/O framework, the most important of these four characteristics are value and inimitability (Hoopes et al., 2003). The question of a resource being rare is important only when it cannot easily be found or copied by other competitors. That resource is a significant contributor to the firm's

competitive advantage. However, in many industries, the majority of resources - land, factory buildings, office space, machinery, staff, and software and so on, are not particularly rare. When looking at a competitive advantage in SMEs, resources are often limited. Thus the emphasis must tend towards added value and signature processes and products that are not easily imitated or substituted.

Concentrating on value and inimitability "...gets to the heart of the RBV..." according to Hoopes et al. (2003, p. 890). Adding to the debate, Makadok (2001) suggests that a valuable resource is not necessarily just a tangible asset, though observable in the firm as a brand name, a patent, or a location. Makadok (2001) and Hoopes et al. (2003) do not differentiate under what conditions resources are valuable, which may be due to important resources being an intangible asset, such as knowledge sets, actions, and behaviours. These resources may not be directly observable and are, therefore, difficult (or impossible) to assign value because it only changes hands as part of an entire unit (Hoopes et al., 2003). In SMEs, capabilities are interwoven in nature and are often resident in a small number of key employees. The SME is vulnerable to losing its critical capabilities if essential employees leave, which usually has a detrimental effect.

Human resources have also been treated similarly in the literature, being elevated by some to being the most valuable resource in the firm (e.g. Barney & Wright, 1997; Prahalad & Hamel, 1990). Human capital can be sub-divided into specific competencies and resources, consisting of the skills, experience and 'common sense' of the firm's employees (Barney & Wright, 1997). As referred to earlier, the SME relies on key employees and their ability to make common-sense decisions that will not adversely impact the firm. The importance of human capital is also recognised by Barney & Wright (1997).

Due to limited resources, the SME critically depends on the quality of its employees, consultants, or strategic partners whether they are inside or outside the firm. The quality and stability of relationships for SMEs, therefore, is often critical for their survival. The resources that compound to build the all-important VRIN resources is often blurred at the boundaries as to what is rare, or of value, or what is inimitable. The seminal work of Barney (1991), "Firm Resources and Sustained Competitive Advantage" is widely regarded as the treatise that led to the emergence of the RBV. Barney (1991) posited that organisations possess heterogeneous resources, thus leading to the proposition that organisations themselves are heterogeneous. Organisations will, therefore, have different strategies and resource mixes that then leads to heterogeneous resources, some of which may develop in VRIN resources. Thus, RBV focuses its attention on the internal resources of the organisations to seek an explanation as to why one organisation can attain (and sustainable) competitive advantage.

Such is the importance placed on human capital and resources in general, Prahalad & Hamel (1990) argue they should be not "locked" inside a business unit but should instead be available to be reused

and modified (if necessary) with other business units within the firm. If there is a clear economic gain for the company transference of investments between business units would make strategic sense. However, from a practical standpoint, identifying precisely what resources and capabilities are in the organisation can be difficult for managers (Grant, 2005; Grant & Jordan, 2012).

The framework was later improved from VRIN to VRIO by Barney (1991) by adding the following question: “Is a company organized to exploit these resources?” The question of relational response by the organisation as a whole is a critical factor for the SME to operate profitably in their markets. Perhaps due to their size and limited resources, the strategic approach of an SME is better measured in terms of how it can orchestrate or organise its resources. Hence, a preference of the VRIO over the VRIN as a framework for this study is justifiably the most suitable.

The question of what exactly are the sources of value is a fundamental tenet of the RBV. The literature perspective is that value flows from firm-specific attributes that satisfy the conditions of VRIO. Accordingly, the discussion continues in 2.3.5 about nature and resources as they are viewed in the RBV Theory.

2.3.4 Resources and capabilities in the Resource-based view

Firm resources, according to Barney (1991, p. 101) are:

“...Firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness...”

The construct previously called "resources" is now divided into resources and capabilities (Amit & Schoemaker, 1993). For the purposes of this study, resources are defined as tradable and non-specific to the firm. At the same time, capabilities are specific to each firm and are used to operationalise the resources, such as procedures, processes and knowledge gathering and sharing (Hoopes, Madsen, & Walker, 2003; Makadok, 2001). The distinction between resources and capabilities as just defined is the commonly accepted definition adopted throughout the RBV literature (Acedo, Barroso, & Galan, 2006; Barney, 2001; Kraaijenbrink, Spender, & Groen, 2010; Joseph T Mahoney & Pandian, 1992; Makadok, 2001; Nyberg, Moliterno, Hale, & Lepak, 2014).

Makadok (2001) emphasizes the distinction between capabilities and resources by defining capabilities as “...a special type of resource, specifically an organizationally embedded non-transferable firm-specific resource whose purpose is to improve the productivity of the other resources possessed by the firm...” (p. 389). Resources are thus “...stocks of available factors that are owned or controlled by the organization, and capabilities are an organization’s capacity to deploy

resources...” (p. 389). Essentially, it is the bundling of the resources that build capabilities. Capabilities have a more significant impact on creating and maintaining competitive advantage than do resources, which are often easier to 'see' and copy (Arndt, Fourné, & MacInerney-May, 2018). In current RBV thinking, scholars insist that only necessary, useful resources and competencies should be viewed as being sources of competitive advantage (Wang, 2013). Similar terms such as core competencies (Barney, 1991; Hamel & Prahalad, 1994), distinctive competencies, and strategic assets have all been used to highlight the critical importance of such asset contributions to competitive advantage, which mainly, describe the same thing (Amit & Schoemaker, 1993; Markides, 1998; Markides & Williamson, 1994; Wang, 2013).

From a critical perspective, the definitions, and interpretations of the nature of resources in the RBV are too prescriptive (Priem & Butler, 2001a, 2001b). The danger in adopting the view of Barney (2001) is that all-inclusiveness of the resource definition is that anything that is strategically useful is a resource. While Barney (2001) suggests the relational inclusiveness is part of the RBV's strength, it is, at the same time, a weakness. A fuller discussion on the shortcomings in the RBV follows in Section 2.3.9.

The concept of competitive advantage and sustainable competitive advantage is very much at the heart of the canonical RBV intertwined with its VRIO resources. The RBV does not address fundamental differences in how different types of resources may contribute differently to a firm's sustainable competitive advantage. In order to continue toward the building of a conceptual model to guide the research, a discussion around the definitions of competitive advantage is advantageous at this time. Figure 2.2 summarises the underlying concept of the RBV.

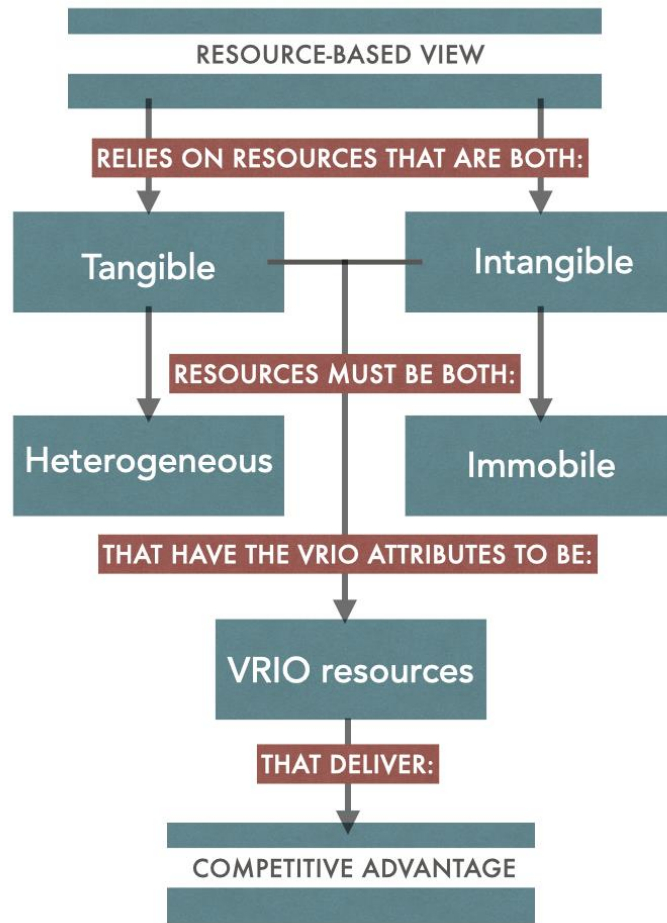


Figure 2-2 – The essence of the RBV Model (Author’s elaboration)

It is widely accepted that SMEs are often faced with a lack of resources forcing them to operate under challenging financial and expertise constraints (Radzi, Nor, & Ali, 2017). The net result is that SMEs may be forced to focus on short-term rather than long-term goals and miss out on the development and exploitation of opportunities existing in the environment to their larger and better-resourced rivals. According to Radzi et al. (2017) in a review of the key attributes associated with SME success from 20 contributors to the field, the most cited was “...entrepreneurial competency which includes the skills, educational background, know-how, and personal motivations/goals appear to be the main contributing factor for small business success...” (p. 33). The next most cited factor was the lack of financial resources, where often, there is a reliance on personal sources of finance in place.

Despite the challenges faced by SMEs, the literature has shown that those that can develop innovative approaches to marketing and branding can overcome some of the challenges (Bowen, Morara, & Mureithi, 2009; Kim, Knotts, & Jones, 2008). Where SMEs concentrate their efforts in niche markets and excel at branding, innovation and value creation, a certain level of competitive advantage is possible (Merrilees, Rundle-Thiele, and Lye, 2011). The reliance on personal contact networks in marketing SMEs is recognised in the literature as one element of competitive advantage (Siu, 2001).

Thus, the literature shows that SMEs must adopt a multi-faceted approach to competitive advantage, which are all underpinned in some way by their VRIO resources. To lay the foundations for the research questions outlined in the introduction, an appraisal of resources and capabilities and how they can interact together to lay the foundations of competitive advantage is required.

2.3.5 Appraisal of resources and capabilities in the RBV

The fundamental principle of the RBV of the firm is that its competitive advantage lies primarily in the application of the variety of valuable resources at the firm's disposal (Rumelt, 1991; Wernerfelt, 1984). A common aspect of successful firms is the continuous drive for added customer value by constant improvement of their product range, along with continuous investment in human resources (HR) and people. This aspect of the RBV resonates strongly with the challenges facing the subjects of this research - the localised SME dealers - and their capability building within the firm. The role of HR in contributing to competitive advantage has been discussed in the literature (for example, Barney & Wright, 1997; Wright, Dunford, & Snell, 2001; Wright et al., 1994). It is difficult to assess which characteristics (for example, knowledge, experience, skill, and/or commitment of a firm's employees) make the largest contribution to the firm's competitive advantage (see Figure 2.3) (Wright et al., 1994; Barney & Wright, 1997).

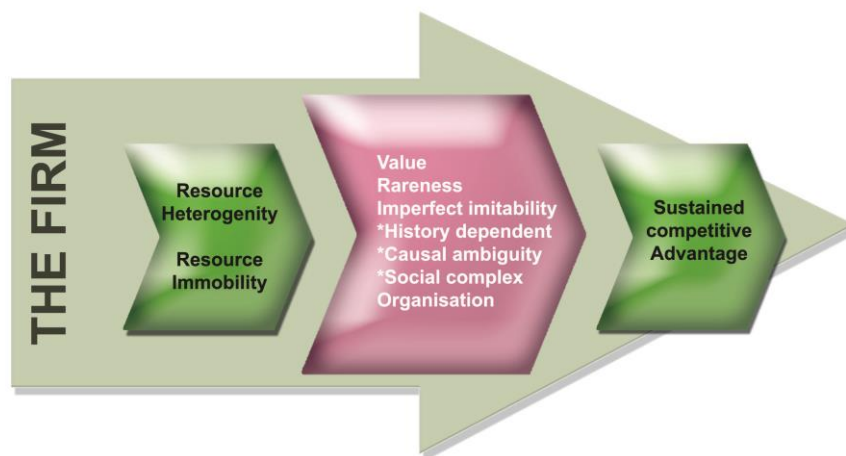


Figure 2-3 - Sustained competitive advantage (Adapted from Barney & Clarke, 2009).

Barney and Hesterly (2006) advocate using a value chain to disaggregate how a firm's activities related to its resources. Knott (2015, p. 1809) cautions that there is a danger that managers could have to make "...a creative leap from an identified activity in the value chain to the corresponding resource configuration or characteristics..." This is not an ideal scenario, since managers could be "...tempted to evaluate the activities themselves as if they were resources, or worse still to evaluate the firm's strategy or the merits of its products or services...." (ibid, 1890). The value-chain method

of analysis may have some merit as long as the evaluation is holistic such that the evaluation of resources are not conducted individually and in isolation (Foss, 1996). In the case of SMEs resources they can be created without necessarily considering how they contribute to the firm as a functioning system. It is not a method that can bring a real understanding of their source functionalities. The suggestion by Barney and Hesterly (2006) contradicts Penrose's (1959) notion that resources become valuable when firms combine them to derive productive outputs. This approach also does not consider the context sensitivity of knowledge-based resources (Knott, 2015).

The mere fact of possessing the necessary capabilities to develop a competitive advantage is not sufficient to guarantee the SME's survival or success (Sirmon & Hitt, 2003; Sirmon, Hitt, Arregle, & Campbell, 2010). Previous studies have shown that firms with far superior resources "...can lose competitive battles to firms with seemingly lesser resources...." . Resources must, therefore, be organised and configured into bundles that collectively can be leveraged to attain a competitive advantage. The focus thus falls on the decisive actions of managers to configure the firm's resources into bundles and then build a strategy that allows the SME to leverage the bundles that exploit opportunities and create a competitive advantage. Managers, therefore, use the bundles of resources and capabilities to capture value from the customer and hence generate wealth for the SME. Value capture and creation form a central theme in this study. Therefore, an elaboration of the nature and scope of value creation and capture is necessary at this stage.

2.3.6 Value Creation, Capture, and the Customer

The term 'customer' and 'consumer' are used interchangeably in the literature. In this study, the term 'customer' will prevail over 'consumer', except for instances where direct quotes are being used from the literature because the business models adopted by the case-study SMEs in this study are involved in a B2B, rather than a B2C model.

The determination of value external to the firm in RBV focuses on the need to address "...the value of resources with theoretical tools that specify the market conditions under which different resources will and will not be valuable..." (Barney, 2001, p. 43). According to Srivastava, Fahey, and Christensen (2001), a firm can be said to have a "...customer-based advantage when (some segment of) customers prefer and choose its offering over that of one or more rivals..." (p.6).

The concept of customer value has been widely used in various strands of strategic management literature, and it would appear that the idea is relatively simple and unambiguous (Du, Jiao, & Tseng, 2006). Since the interpretation of customer value varies significantly, there is no single well-accepted definition. Naumann (1995) suggests that customer value depends on a triad of product quality, service quality and value-based prices. The importance of a balance between quality, cost and

delivery times is argued instead by Pine (1993). Marketing managers should intimately understand what their customers' value and what value they are willing to pay. This is a necessary capability to gain market share in a competitive market (Flint, Blocker, & Boutin Jr, 2011). Within the service-dominant logic (SDL) discourse, suggest that customers are more satisfied with and loyal to suppliers who can predict with some accuracy what the customer wants (Vargo & Lusch, 2008). The ability of the firm to develop the skills and knowledge to accurately align themselves with the requirements of the customer on which they place value is regarded by Flint et al. (2011) as a 'customer value anticipation' capability. Madhavaram and Hunt (2008) recognise the difficulty to achieve a level of understanding of 'customer value anticipation' without close relational interaction with customers. Moreover, the authors conceded that it is most likely to require a higher-order and interconnected approach of market intelligence related capabilities, and knowledge building and sharing capabilities.

Despite this critical role, customers have received relatively little attention in the strategic management literature (Priem, 2007). Remarkably, Makadok and Coff (2002) argue that there is little need to understand consumer utility because it "...is largely superfluous to the overall goal of the strategy field..." (p. 12), which, they say, is "...to explain firm profitability—and firm profitability is determined by the value captured by the firm.." (Makadok & Coff, 2002, p. 10). As the success of customer-focused companies such as Dell Computers, Virgin Group, and Singapore Airlines have shown, the views expressed by Makadok & Coff (2002), and others are manifestly misleading.

Conversely, Priem (2007) argues that customers must be at the centre of any strategic formulations because the positive experience of value from the customer is tantamount to a successful relationship between them and the firm. In other words, as Priem (2007, p. 219) explains: "...value creation, by offering benefits that induce payments from willing consumers, is a precondition for value capture..."

The importance of customer input is made explicit by Jørgen Vig Knudstorp, CEO, LEGO:

"The LEGO community, like the basic interchangeable plastic brick, is one of the company's core assets [...] While we have 120 staff designers, we potentially have probably 120,000 volunteer designers we can access outside the company to help us invent."

The RBV not only ignored the mechanisms associated with value creation but is too vague on the difference between value creation and value capture, and what determines a valuable resource. Bowman and Ambrosini (2000) use value as the subjective valuation in defining the benefits derived by customers. Bowman and Ambrosini (2000, p.1) argue that "...a distinction needs to be made between useful value, which is subjectively assessed by customers, and exchange value, which is only realised at the point of sale..." Additionally, the authors suggest that it is the firm profits (rents) originated through labour performed that is the source of the value brought back to the firm.

Moreover, Bowman and Ambrosini (2000) suggest that differences in profit between rival firms are, therefore, because of "...labour performing heterogeneously across firms..."

Building on their argument, Bowman and Ambrosini (2000) argue that value capture by the firm is determined by "... the perceived power relationships between buyers and sellers..." The work of Bowman and Ambrosini (2000) is refreshing in that it looks at the value in terms of the unitary level of the individual and their roles in developing value for customers, as well as building a relationship with a power balance that allows the firm to re-capture value itself.

There is a sense of ambiguity surrounding the definition of 'value' in the RBV. As is indicated by Bowman and Ambrosini (2000), the 'value' was considered from two perspectives: the customer and the firm. In most of the RBV perspectives, value is defined in terms of *being* 'valuable' resources that can be a strength to the firm as long as they satisfy the condition of VRIO. Value tends to be discussed in broad, general terms with few commentators seeking to disaggregate value other than resources are valuable in relation to a specific market environment (Amit & Schoemaker, 1993).

Thus, the term value has been tagged to resources as a qualification as to whether they are "valuable" or not. A resource that enables a customer's needs to be met is considered a valuable resource by Bogner and Thomas (1992) in their study of the pharmaceutical industry. The consensus in the literature is that a firm's competitive advantage derives from its resources (for example, Barney, 1991; Conner & Prahalad, 1996; Helfat & Peteraf, 2003; Penrose, 1959; Peteraf, 1993; Prahalad & Hamel, 1990; Prahalad & Ramaswamy, 2004; Wernerfelt, 1995, 2006). The notion of resources continues in much greater detail in Sections 2.37, but suffice to say, for the moment, that the boundaries of resources' definition remain much debated in strategic management. To complicate the discussion, Barney (1991) states that not all resources positively contribute competitive advantage, some are, in fact, negative.

Thus, the question of where value is determined remains unclear. Is it defined externally to the firm to the marketplace as added value, or to the firm in the form of some advantage over its competitors? The debate in the literature as to *how* value is created through what transformation of resources has not been a specific focus in the RBV debate. This is despite the importance of resources of value creation and capture being pivotal to the RBV. As will be discussed below, definitions of value capture and creation remain uncertain in the literature.

The vagueness and the lack of parameterisation of value in RBV is a fundamental weakness of the theory (Deligönül & Çavuşgil, 1997). Similarly, its delineation of competitive advantage in the RBV theory is also unclear. Since these are two fundamental tenets of RBV, a clearer understanding of the key dimensions of customer value is urgently needed. Four core dimensions of customer value have

been suggested by Keller (1993) and P Kotler and Armstrong (2013) as being attributes, benefits, attitudes and network effects of a product or service.

The RBV literature also fails to identify when a ‘value’ is created in the firm, together with its origins and evolution. This significant gap in the literature provides an opportunity to assess using SMEs as value creation would be expected to be measured easier than in large firms. Accordingly, a clearer understanding of the demand (customers) side of the market is critical to understanding the RBV resource bundles (Schmidt & Keil, 2013). The literature has tended to take a broad-grained approach to resource specification; thus, measurement to the degree of specification of resources in firms remains under-researched. While the literature has a strong tradition in researching the customer in terms of key account management (KAM), customer centricity, sales methods and so on, the RBV has given scant attention to the customer as a possible value-generating resource. Accordingly, section 2.3.7 examines the customer as a potential resource in the firm.

2.3.7 The Customer as a Resource

Despite ever expanding scholarship in the construct, Srivivasta et al. (2001) identify the ever-developing polarisation of the RBV theory. Srivivasta et al. (2001) recognise the exponents of the theory (such as Barney, 2001) and those that criticise RBV (such as Priem & Bulter, 2001a, 2001b).

As discussed in section 2.3.4, the tension in the scholarship is focused on what constitutes value. Almost all the strategic management theories have value at their central core. In simple terms, if the product or service does not engender a perceived value for a customer, that customer is unlikely to pay for it. Since competitive advantage, in whatever form it takes, is concerned with increasing profits or market share, then the scant attention to an agreed definition of value is bewildering. Equally, Srivivasta et al. (2001) highlight that there is also a lack of understanding of how resources are leveraged to deliver a superior value-added product or service to achieve competitive advantage. The conceptualisation of value should, perhaps, be viewed as two independent but connected constructs: one that flows to the customer, and the other that is returned as higher profits than any other rival. When the firm is then able to extract the ‘value’ back from the customer, the result is “...superior (including financial) resources that can nurture market-based assets and capabilities in the future...” (Srivastava et al., 2001, p. 2).

Levitt (1960) recognises the importance of customer satisfaction. Galbraith (2011) states that customer-centric firms look to leverage superior economic performance through meeting customers’ demands in the best way possible and minimise customer churn. Galbraith (2011) distinguishes product-centric and customer-centric firms:

“... product-centric company tries to find as many uses and customers as possible for its product. In contrast, a customer-centric company tries to find as many products as possible for its customer, and it has to integrate those products...” (p.9)

The path taken by the firm has a profound effect on its strategic direction. For example, product-centric companies are focused on specific profit centres. This can be around a particular product or a strategic business unit. Thus, analysis of performance is usually focused on products and product lines. Conversely, the customer-centric approach is structured more around customer groupings or market segments. Management analysis is, therefore, focused on processes, resources, managerial actions, knowledge assimilation, and human resource considerations (Galbraith, 2011). As will be discussed in the section immediately following, there is much contentious debate around the definition of resources.

The seminal contributors to the strategic management literature, the customer is regarded as being part of the external environment (for example, Ansoff, 1957; Porter, 1996; Shapiro, 1989). Others consider the customer as an acknowledged client and as a key stakeholder in the determination and conduction of a firm's strategy (Donaldson & Preston, 1995). Still, others such as Porter (1979) regards customers as a source of uncertainty because of their potential bargaining power.

Literature streams, such as marketing and service management, have traditionally linked customers as a resource for the firm. For example, Gouthier and Schmid (2003) argue that it should be not be expected that firms are in close contact with their customers in a service-orientated industry. There is an ever-expanding number of studies that acknowledge the importance of interaction between the firm and its customers (Vargo, Maglio, & Akaka, 2008; Vargo & Lusch, 2004). Customers who are selected based on their lifetime value provide higher profits in future periods than do customers chosen based on several other customer-based metrics (Venkatesan & Kumar, 2004). The challenge for all firms, big or small, is how to achieve a balance of convergence between marketing actions and relationship management of customers. Some metrics, such as customer lifetime value, are used by larger firms, where the data they have collected about customers and integrates customers and with how the firm interacts with them (Venkatesan & Kumar, 2004). In essence, what customer lifetime value and customer relationship models are trying to achieve is the allocation of resources and capabilities in the distribution and allocation of resources to maximize the value of the customer base.

While the customer value construct remains undefined in the RBV, it nevertheless is a critical concept. Zubac, Hubbard, and Johnson (2010) suggest that managers must invest in resources and capabilities to develop a shared understanding of the multidimensional aspect of customer value. By

gaining and sharing this knowledge, managers can map customer value against the firm's resources and utilise them to deliver the best compromise between an optimal product and service mix to the firm's customers (Zubac et al., 2010). The first step is establishing a path towards creating the all-important VRIO resources that lead to competitive advantage.

The external environment relevance of the inwardly looking RBV theory is to identify and elucidate "...the value of resources with theoretical tools that specify the market conditions under which different resources will and will not be valuable..." (Barney, 2001, p. 43). It is necessary for the firm to correctly configure offering that customers can view and experience and determine whether or not they wish to purchase (Philip Kotler, 2009; Philip Kotler & Lilien, 1983). What this means, in RBV terms, is that the firm must have a customer-based advantage that customers prefer and hence choose its offering over that of one or more rivals.

There is a lack of clarity of 'value' and vagueness attributed to a definition of competitive advantage in the context of the RBV, as has been discussed several times so far. The resulting gap in our understanding of these two key underpinning concepts leads to frustration and opportunity in equal measure. The key dimensions of customer value are an example of an important concept that is left without much by way of empirical testing or any substantive theoretical development in the RBV literature.

While the RBV theory does not attempt to contextualise customer value, it is left to the marketing domain to seek some clarity in this critical area. Keller (1993) and Kotler and Armstrong (2013) suggest that there are four core dimensions of customer value. While it is not intended to stray into the domain of marketing management, a very brief mention of the four components is useful at this point as it lays down metrics for evaluation purposes for the later stages of data collection and discussion. The dimensions are: (i) product features and **functional** attributes; (ii) **benefits** of product ownership; (iii) customers **attitudes** to product/company/brand; and (iv) **networks** of users of the product.

Research has shown that customers typically assess the functional attributes of a product or service insofar as what makes it usefully used (Srivastava et al., 2001). Functional attributes are also visible to competitors and so can be copied if necessary. In RBV terms, therefore, superior functional attributes may confer a temporary competitive advantage.

The experiential benefits experienced by the customer from a service can be technical support, customer training, or quick and reliable delivery. From a product perspective, perceived quality, functionality, and value for money can also be important determinants. Where experiential benefits

are concerned, the time available to perceive the experience is limited, so a positive recommendation or direct experience with a particular brand may confer a competitive advantage while there are no credible rivals.

The customers' attitudes can be based in part upon their assessment of attributes and benefits over time and their favourable association with a particular brand. Attitude can also include a sense of exclusiveness that is associated with some brands. In RBV terms, the exclusivity of a product confers a strong sense of customer satisfaction with the owner, thus establishing a competitive advantage over its fewer exclusive rivals highly probable.

Perhaps the most intriguing customer value dimension for customers is that of the effects of networking. According to Arthur (1994) increasingly, owners of iconic branded products derive value from being part of an exclusive group (e.g. the owner of a Rolls-Royce car) or being a member of enthusiast's networks associated with a brand (e.g. Harley-Davidson owners). Quinn (1992) makes an interesting observation that if a firm is the focus of interconnected formal or informal relationships with other products, it offers the opportunity to increase the reach of its brand. An example is seen with the multitude of third-party products for Apple devices. Thus, firms such as Apple, increases its capacity to generate relationships with customers that has a considerable reach beyond the resources they own and control. Recent research shows that the value of a product to customers can be enhanced by the availability of a wide range complementary goods and services from third parties (Frels, Shervani, & Srivastava, 2003). Research has also shown that the products that might be considered the best do not always gain the competitive advantage expected, however those that are the best networked usually prevail (Srivastava et al., 2001).

The perspective of customer value from the marketing management literature casts an interesting light on how value could and should be understood. As discussed earlier, the RBV scholarship does not clearly explain the concept of value. After discussing the marketing management interpretation of value, section 2.3.8 unpacks the areas of confusion and contention with an RBV context.

2.3.8 Brand Evangelism and Customer Devotion

There has been much debate in the literature around understanding the relationship between the personality of brand (or customer) evangelism, consumer passion and personality (Matzler, Pichler, & Hemetsberger, 2007). In the discussion that will follow, brand evangelism and customer evangelism, following Chaudhuri and Holbrook (2001), will be considered as two sides of the same coin and will be considered as being from the point of view of a customer or user of the products. Additionally, in the context of this study, brand/customer evangelism is viewed as a set of positive

behaviours of supportive customers that includes demonstrating the products and providing training of product and additionally, providing positive customer referrals, word of mouth (WOM) recommendations, and less than positive comments about rival brands.

Research has shown that some brands are able to engender almost religiosity and cult-like states amongst their customers (Pimentel & Reynolds, 2004). Consumer associations with brands can take on many different forms, for example, "... person-brand relationship, self-brand connections, and consumer-company identification (Pimentel & Reynolds, 2004). The extremities of brand loyalty survives poor performances, higher prices and even scandals, which is a valuable asset associated with any company (Pimentel & Reynolds, 2004).

Some researchers have compared customer devotion as a type of cult following (Carr, 1996). Amongst customers there are those that are described as 'committed buyers', where Aaker (2009) describes as the Harley-Davidson owner who wears the company's logo as a tattoo. While Harley-Davidson, the same level of devotion is described in a research study of VW Golf GTI customers by Matzler et al. (2007). At an Golf GTI meeting in Reifnitz, Lake Wörthersee, Austria, a self-administered questionnaire was used gain insight in to the levels of brand passion, emotional intensity and brand evangelism (n = 280). The findings revealed that customers who are passionate about their cars are more likely to be brand or product evangelists. However, personality traits are also an important fact, with the more extraverts being more like to be more vocal in promoting the brand. A similar study has been carried out by Meirani (2019) on Honda cars.

Passionate customers are not all 'petrol-heads', but are to be found in many other diverse industries. For example, Pimentel and Reynolds (2004) also highlight iconic television shows such as X-Files and Star Trek that have gained large cult followings. Perhaps, one of the most iconic of brands belongs to the computer industry. Apple, as many successful brands do, "... rely on emotional characteristics to obtain consumers' interest and attention.... a warranty for quality and respect, features transferred to [their] consumers..." (Constantin & Stoenescu, 2014, p. 123). Apple has become very capable of build a strong brand personality and imparting that personality through its loyal customer base, so the extent that new product launches are eagerly anticipated by computer nerds as well as normal users. Apple customers are confident that the company knows them well enough to introduce innovative products and their customers will keep returning to buy more Apple products. Accordingly for a company a accomplish a delicate balance between meeting the needs and expectations of both the computer nerd and the standard user serves only to embellish a stronger evangelism with its customers.

Moreover, customers often consider a brand to human properties, and build a relationship with the brand (Fournier, 1998; Sikkel, 2013). Remarkable, in a study by Sikkel (2013), the findings show that the strength of association between brand and age of consumer increases over time. Research conducted by Liu and Wang (2020) into Apple online fan communities in China have found that such devotion to the brand could almost be conceptualised in terms of religiosity. The findings demonstrate that the Apple fans exhibits similar characteristics “...between a religious person and a religion...”(p.81). The study concludes with three fundamental dimensions of brand evangelism that underpin the successful brand: “...brand faith (value identification, paranoid, and hope), brand religiosity (wonder, awe, and ecstasy) and brand devotion (gratitude and allegiance)...”(p.82).

For a firm to possess such positive brand assets and to have customers who act as passionate evangelists are a primary source of competitive advantage and future earnings (Aaker, 2009). According to Choudhury, Mishra, and Mohanty (2019, p. 4), “...Brand evangelism, egocentric relationship, customer engagement and brand efficacy are the key factors which develop affinity of customers for any brand...” Such brand devotion leads to word of mouth (WOM) marketing by evangelist customers and is recognised as one of the most potent methods of building a competitive advantage. At the lower end of the scale is the simple ‘likes’ on social media platforms (such as Facebook) to the further extremities of active brand promotion through influencers who had several million followers.

Still, there are hints in theory as well as in real-life experience that passion for a brand can cause more intense and more extreme acts than just positive word-of-mouth. Pimentel and Reynolds (2004) have shown that truly devoted consumers not only spread positive WOM but eventually engage in recruiting in order to actively convince others of their beloved brand.

2.3.9 Areas of Confusion and Contention

Barney (1991), Penrose (1959), Rumelt (1984, 1991), and Wernerfelt (1984) take the view that the firm’s internal non-imitable resources can explain why some firms are able to make superior profits over rivals even in highly competitive markets. However, despite some harmony existing between individual scholars, there are four specific areas of concern and disagreement in the literature (Rumelt, 2003):

1. An accurate definition of value is lacking. There is no clear conceptualisation of whether the notion of value refers to the customer or the firm, or both. Moreover, there is no agreed formulation on which value can be measured and how actors perceive it.
2. Outside of its meaning in economic theory, what is the relevance of rents, and what do they mean in the context of competitive advantage? It is not clear if rent means simply higher

profits than rivals or sustainable profits over a long period, or indeed, increased market share lead to higher firm capitalisations.

3. A measure of competitive advantage is suggested that the firms that deploy resources on a particular activity instead of another perhaps more lucrative opportunity. In other words, the managers made the wrong choice, and as such, a bigger opportunity has been lost. The seriousness of the mistake may lead to the surrender of competitive advantage to a rival. The concept, known as opportunity cost, is not clearly defined in the RBV scholarship. Since opportunity cost cannot be quantified until some time afterwards, it is difficult to see how it can be integrated into a useful, practical model of the RBV.
4. Competitive advantage has a different interpretation in different contexts. For example, an SME may be content with enjoying a small market share with loyal customers and enjoying adequate profit margins that are adequate for the firm. On the other hand, competitive advantage for a large organisation might mean increased market share and profits to satisfy the needs of the various stakeholders. At both extremes of the continuum, competitive advantage can mean having enough threshold resources to continue with a small but profitable market share or be the market leader worldwide. The literature does not make this clear, and therefore, the interpretation of competitive advantage remains a subjective ontology.

Despite these confusions, a clear definition of what competitive advantage means is necessary. The question also persists if competitive advantage can mean the same thing in different sized organisations. For example, a large organisation must have a strong market position, whereas an SME might be happy enough to remain more profitable than its rivals.

In a similar vein, but with a slightly different focus, Barney (1991) contends that resources in the firm were of value in gaining and sustaining competitive advantage from those internal resources developed over time. Barney's (1991) VRIO framework was developed to test if a resource is a source of sustainable competitive advantage. The conditions laid down by the VRIO framework do not allow best practices to be considered as the source of competitive advantage because if a rival can duplicate a and/or a resource, it cannot be a source of advantage.

Barney (1991) is explicit in his original article about the nature of resources in the firm:

“...Firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enables the firm to conceive of and implement strategies that improve its efficiency and effectiveness...” (Barney, 1991, p. 101).

Moreover, resources are critical and should be developed, so they are valuable:

“...Resources are valuable when they enable a firm to conceive of or implement strategies that improve its efficiency or effectiveness...” (ibid. p. 105).

Helfat and Peteraf (2003, p. 999) expand on Barney’s definition by defining a resource as:

“...an asset or input to production (tangible or intangible) that an organization owns, controls, or has access to on a semi-permanent basis...”, and

a **capability** as the

“...ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result....”

Helfat and Peteraf (2003) leave the door open to consider the development of resources and capabilities do not always have to be solely for competitive advantage, but to achieve “... a particular end result...” However, competitive advantage is still at the heart of RBV and through the lens of RBV is defined as having attained through the deployment of the valuable resources:

“...A firm is said to have a competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential competitor...” (Barney, 1991 p. 102).

The RBV, therefore, suggests that firm must develop, firm-specific core competencies that are unique that will allow them to outperform competitors. Barney (1991) refers to the necessity for the resources to satisfy the requirements of VRIN (or the later, VRIO). If the condition of VRIN/O is satisfied, there are potential sources of sustainable competitive advantage. Achieving a sustainable competitive advantage is the holy-grail in the strategic management and strategic marketing literature (Fahy & Smithee, 1999). It is the central focus of this study.

One of the questions central to competitive advantage relates to why firms are different. What factors underline firm and performance heterogeneity amongst competitors? Why can some competitors attain competitive advantage despite intense competition from more extensive and better resourced rivals? The introduction of the RBV was the first step in an inward-looking approach to the factors that make a firm different from its competitors.

2.3.10 Are there limitations of the Resource-Based View?

Arguments against the RBV suggest that it ignores the nature of market demand (Wang, 2013) and focuses only on the firm's internal resources (Dyer & Singh, 1998). Contributors to the RBV debate suggest that the external and internal elements cannot be separated (Andrews, 1997; Chandler, 1962; Dyer & Singh, 1998). Moreover, Dyer & Singh (1998, p. 661) suggest that there is empirical evidence

to support the view that a firm's critical resources may "...span firm boundaries and may be embedded in inter-firm routines and processes..." hence suggesting that resources are developed outside of the firm.

In essence, the suggestion is that the alliances formed between firms are becoming an "...increasingly important unit of analysis," as firms share valuable resources and capabilities that can be viewed as a set of inter-firm alliances and routines. Indeed, Dyer & Singh (1998) recommend further study in this area because of the "explosion of alliances" between firms seeking to develop resources in a collective sense. Similarly, the importance of the link between the firm's internal resources and its external market conditions is highlighted by Amit & Schoemaker (1993), while a broader link between the organisation and its networks (Dyer & Singh, 1998; Wang, 2013) are all significant contributors to competitive advantage.

If there are limitations to the RBV, and these come from the difficulties that firms face as markets become more globally integrated and more easily accessible, then companies must rise to the challenge of new technologies and new forms of competition. However, the great danger is that business leaders often work harder at 'doing more of the same' rather than confronting the need to do something different in the face of emerging threats (Helfat & Peteraf, 2009). To be successful in this 'brave new global world', managers must be able to both adapt to challenges and exploit opportunities while still ensuring that the company remains in touch with exogenous technological change and that this feeds through to the firm's strategic innovation (Helfat, 2009).

Priem and Butler (2001a) initiated one of the most interesting academic debates in strategic management when they critiqued Barney's (1991) original article on the RBV, which was published in Vol. 26 (1) of the *Academy of Management Review*. Barney (2001) responded by defending his research, which was then followed by a further critical response by Priem and Butler (2001b).

The critiques are useful as they suggest where shortcomings exist and where improvements to RBV could arise. Kraaijenbrink et al. (2009), in their discussion paper, identify eight key points of criticism that are now briefly summarised:

- **The RBV is not easily operationalised:** Kraaijenbrink et al. (2009), criticise the RBV for not having any immediate managerial implications. As discussed earlier, the lack of definition of value in the RBV is a deficit that has implications for 'operational validity' (Priem & Butler, 2001a, cited in Kraaijenbrink et al., 2009). In other words, the RBV does not provide a foolproof model of how to develop the VRIO resources that can develop a competitive advantage. The RBV creates an illusion that the development of VRIO resources is a linear process and that the model is a simple representation of the socially complex organisational structures. Further related tension is highlighted by Lado, Boyd, Wright, and

Kroll (2006) in that there is a disjoint in the RBV between descriptive and prescriptive theorising.

- **RBV is a never-ending process of development.** RBV implies a continuous evolution (or regress) and reconfiguration of resources to maintain innovation leadership or retain competitive advantage. In this sense, an infinite regress is defined as a series of related capabilities with a first capability but no last capability, where each capability leads to or generates the next capability in some way. Thus the RBV focuses on the endless development of superior capabilities to develop structures and processes to trump rivals to achieve competitive advantage for the present. As Collis (1994) suggests, there should always be second-order capabilities in development, such that they can eventually morph into critical first-order capabilities. Collis (1994, cited in Kraaijenbrink et al. (2009)) suggest that the future needs and trends in the market should be supported through the development of second-order capabilities. Again, the managers' competencies will be critical because the same rules of VRIO will apply if the firm is to attain a competitive advantage in a changing market.
- **The lack of generalisability of the RBV.** The third identified by Kraaijenbrink et al. (2009), exposes the limitations of the RBV in practice. Every industry is different, and every firm competing in that market is also different. The core concept of the RBV is the heterogeneity and immobility for resources that satisfy the conditions of VRIO. Similarly, the resources deployed and operationalised by large firms are very different to the SME. Accordingly, the concept of uniqueness is not transferable across different industries and markets, let alone between large and small organisations. Kraaijenbrink et al. (2009) identify that uniqueness cannot be generalised and so exposes a limitation of the RBV. Connor (2002, cited in Kraaijenbrink et al. (2009)) argues that the RBV is more suitable for larger organisations that enjoy a significant market presence. Presumably, the argument made by Connor (2002) is that the resources are more defined and easier to quantify in larger organisations. Connor (2002, cited in Kraaijenbrink et al. (2009)) makes another compelling argument that RBV is suitable for larger firms because of the market position they always have to strive for a sustainable competitive advantage. In keeping with the argument made earlier, the SME may not always want to seek a sustained competitive advantage, and they are content with their business model. Kraaijenbrink et al. (2009) refer to Miller (2003), where the argument is advanced that in developing and acquiring additional VRIO resources are path-dependent. Those firms that already possess these resources should be able to acquire and develop new valuable resources with comparative ease compared to rivals who do not have such resources. The

central argument being that VRIN resources that lead to competitive advantage must be difficult to obtain or develop.

- **Strategic competitive advantage is not achievable over the long term.** One of the chief criticisms of the RBV is that it is too static and does not take into account markets that can change rapidly. In a sense, the inference is that strategic or sustainable advantage can only be a temporary state. Sooner or later, it will be competed away by superior VRIN/O resources or by disruptive technologies. Kraaijenbrink et al. (2009) quote Eisenhardt & Martin (2000) and D'Aveni (1994) that every advantage gained will eventually come under threat and be taken over by some other firm. The argument is based on the proposition that a competitive advantage can only be sustained if the process by which resources are created and regenerated is dynamic (Kraaijenbrink et al., 2010).
- **RBV shortcomings as a theory of the firm.** The RBV explains the differences between firms and why some are capable of achieving superior rents over rivals and how competitive advantage can be achieved. The approach also explains why a firm does what it does, so it looks beyond the sole purpose of profit generation. RBV still relies heavily on complementary areas with strategic management to bridge some of the gaps in uncertainty. For example, Grant (1996, cited in Kraaijenbrink et al., 2010) highlights the requirements of knowledge flow and generation in firms (the Knowledge-based View) as a prerequisite for sound decision making. Likewise, established innovation practices that have been honed over time to be a compelling lens through which to segregate the more promising idea should also be considered (Goffin & Mitchell, 2016)
- **Are VRIN or VRIO resources critical for sustained competitive advantage?** A fundamental axiom in the RBV is that if a firm possesses resources that satisfy the requirements of VRIN and that they correctly deploy these resources, the firm will enjoy a sustained competitive advantage (Kraaijenbrink et al., 2009). As discussed earlier in Section 2.3.3, Barry (1994, cited in Kraaijenbrink et al., 2009) reiterates the importance of the organisation of the resource and skills such that they are aligned in a strategically advantageous way. Foss and Knudsen (2003 cited in Kraaijenbrink et al., 2009) stress that the rarity and immobility of resources is a necessary essential condition for competitive advantage to be accepted. Still, they are only effective if the remaining requirements of VRIN/O are also present. Thus the complementary nature of the VRIN/O is emphasised. RBV also suggests that resources that qualify for VRIN/O status are path-dependent and take time to build. Hence, RBV falls short when changes need to be made in short time intervals. The divergent stream of dynamic capability theory

addresses that very area of high-velocity markets. Dynamic capability theory takes a more focussed approach on the micro-foundations of the essential capabilities that influence competitive advantage (Teece, Pisano, & Shuen, 1997). While dynamic capability theory is not without its detractors for its failure to delve deeper into the ‘black-box’ of strategy (Eisenhardt, Furr, & Bingham, 2010; Eisenhardt & Martin, 2000), the same charge can also be levelled at the RBV. There is no focus afforded to the origination of sustainable competitive advantage lies at the micro-resource level, or at least, “...at the level of the individual resource...” (Kraaijenbrink et al., 2009, p.9). The second stream identified by Kraaijenbrink et al., (2009) is the neglect of entrepreneurial and managerial functions in the RBV. Knowledge management and learning processes have been associated with achieving a long-term competitive advantage. Obtaining knowledge, by whatever means, is only the start of the process; it needs to be managed, shared and nurtured to qualify for the VRIN/O attributes. The entrepreneurial manager is required to obtain accurate and relevant knowledge, then interpret accurately that knowledge which it will go on to codify and disseminate through the firm in a way that builds appropriate VRIN/O resources. The human element of the VRIN/O is entirely ignored in the RBV but is discussed only in abstract terms (Spender & Scherer, 2007). The decision-making capabilities and judgment of the entrepreneurial manager are also highlighted by Kraaijenbrink et al. (2009), citing Mahoney (1995).

- **The RBV is a tautology.** The charge of tautology RBV, principally by Priem and Butler (2001) and Collis (1994), is that the reasoning underpinning the theory is circular and self-verifying and is, therefore, operationally invalid. The criticism revolves around the generality of the conditions outlined by the RBV for the requirements of competitive advantage. In Barney’s original article (1991, cited in Kraaijenbrink et al., 2009), the following verbatim quotations have been subject to charges of tautology:
 1. *“Firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness”* (Barney, 1991a, p.101, cited in Kraaijenbrink et al., 2009, p. 15),).
 2. *“Resources are valuable when they enable a firm to conceive of or implement strategies that improve its efficiency or effectiveness”* (ibid. p. 105 cited in Kraaijenbrink et al., 2009, p.15),).
 3. *“...a resource is valuable if ‘it exploits opportunities and/or neutralises threats in a firm’s environment...”* (Barney, 1991, p. 105).

4. “A firm is said to have a competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential competitor” (ibid. p.102 cited in Kraaijenbrink et al., (2009, p. 15),).

The source of the tautology in the RBV is the conceptualisations of ‘value’ and ‘uniqueness’ (Kraaijenbrink et al., 2009). The firm's uniqueness can achieve sustained competitive advantage by creating value for the customer and the firm itself through reduced costs through efficiencies and either passing savings on to customers or increasing value-added activities to the customer (Kraaijenbrink et al., 2009),. Therefore, value can be created in more than one way. The imprecise and tautological definitions of value offered is perhaps one of the shortcomings of the RBV.

Kraaijenbrink et al. (2010) propose that evaluating value should be done at two different time intervals between the development of acquisition of the VRIO resources and the point at which sustained competitive advantage can be declared. The attractiveness of this approach is three-fold:

- The tendency towards tautology is diminished or significantly reduced;
 - The RBV can be re-framed as a theory of path dependency over strategic resource allocations, which constrain managers from intentionally leading the firm towards a sustained competitive advantage
 - Allows for an explanation as to how or why firms differ even when they have similar initial resource endowments and make radical changes or deviations over time.
 - Thus, in taking a more heuristic view, the gap in the literature and the increasing difficulties with establishing external 'objective' bases for resource value might be a better way to address this problem.
- **The definition of a resource is overly inclusive.** One of the most compelling critiques of the RBV is that of the over-generalisation of its axiomatic definitions, most notably, that of resources. Barney (1991, p. 101) defines resources; thus:

“Firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness”.

The locus of the argument by Barney (1991, 2001) is that the all-inclusiveness of the RBV is part of the strength of the theory. Effectively, this means that the only resources are strategically useful and nothing else. The problem with this approach is that it does not acknowledge or draw a distinction between inputs and capabilities that build towards these resources. Additionally, the relational aspects of resources are also excluded, which is problematic since the firm is always in a state of flux regardless of its size or

environment. The static view of RBV can be complimented in part by the dynamic capability view that facilitates the interchange of processes to integrate, reconfigure, gain and release resources to develop into strategically import VRIO resources.

Wernerfelt (1984, p. 172) defines resources consistent with the all-inclusiveness of Barney, but provides considers the ever-changing nature of resources:

“By a resource is meant anything which could be thought of as strength or weakness of a given firm. More formally, a firm’s resources at a given time could be defined as those (tangible and intangible) assets which are tied semi-permanently to the firm”

The fundamental problem remains in how the fundamental differences between how the different resources contribute to sustained competitive advantage. The RBV appeared to lack a fine-grained approach; for example, other resources such as human, financial, physical are all treated in the same way. This is a challenge in using the RBV is the study of competitive advantage in SMEs, where, by definition, a fine-grained approach is necessary. Barney and Clark (2007) confronted this shortcoming by suggesting a typology of resources that can be categorised as ‘resource-based’, ‘capability-based’, or ‘competence-based’. Barney and Clark (2007) are favouring a base logic, but still not addressing the fundamental reasoning that firms change at different rates.

Concerning SMEs in particular, the RBV theory would benefit from an expanded basic logic that explicitly considers the differences between resources and resource ownership. For example, resources are either static or dynamic, tangible or intangible, technology-based or knowledge-based, interior or exterior to the firm, and perishable or not perishable.

While the above critique identifies eight separate assessments of the RBV, the most critical centre on the broad definitions of resource(s) and the ambiguity of value, likewise, the RBV leaves one wondering as to a precise definition of sustained competitive advantage. It can mean different things to different firms. Given that the scarcity of financial capital often restricts the SME, human and knowledge resources as a definition of competitive advantage may have a different meaning for the SME as opposed to a much larger rival. The lack of attention in the RBV of how resources can be bundled and the critical human contribution to the creation and propagation of value creation is an area for improvement in the theory. Likewise, little attention is also given to the extent of resources interactions and how they combine to produce more productive resources that attain the all-important VRIO status.

In summary, the RBV contributes to strategic management theory as to “why a firm exists” and attempts to explain the strategic positioning of the firm and its performance against its rivals (Gibbons et al., 2016, p. 28). The shortcomings of RBV, particularly its static nature, led to the call

for a theory that addressed firms that operated in markets that are subject to rapid change, termed high-velocity markets. The dynamic capability theory has developed because of the need for a new theoretical approach explaining how firms can compete better than rivals who have similar resources and capabilities in markets that can change rapidly. While the RBV is useful in providing an overall view of how the case-study SME dealers in their local markets exist and operate in a general sense, a more dynamic interpretation may be required to sit alongside the RBV in some cases.

The RBV suggests that the SME should only compete in markets for which it has well-endowed resources and neglect everything else. Furthermore, RBV offers no clear guidance on how long the firm's present resources are sufficient in maintaining a competitive advantage over its rivals. There is no good reason why any firm should remain static, especially an SME.

The debate as to whether the RBV is a dynamic or static view remains robust. The theoretical underpinning of the sustained competitive advantage paradigm is by the nature of 'sustainability', a static concept. In other words, while a firm enjoys a position of competitive advantage, the market is in equilibrium, and hence, static. The alternative view is that some markets are highly volatile and, therefore, in a dynamic state. A theory to explain the alternative dynamic change view and how firms react to a rapid change in the market is the core of the idea of dynamic capability theory discussed following (Di Stefano, Peteraf, & Verona, 2010).

2.3.11 Asset Orchestration

Assets possessed by a firm can be tangible as well as intangible. A key underlying assumption of the RBV is that in any given industry there will be heterogeneity between rivals as a condition of competitive advantage. The literature agrees with the need for efficient and effective internal coordination of a firm's assets has a direct influence on the firm's performance. Accordingly, it is safe to assume that firm's that can coordinate, and if necessary, reconfigure, their assets more economically, efficiently, and correctly, then they have a competitive advantage. As Amit & Schoemaker (1993) also agree that the firm that can achieve changes in their asset structure in high velocity markets is also a valuable resource not easily imitated.

In important aspect of both the RBV and DCV is the importance of asset and how they are managed and configured. The transforming of existing assets in order to realign with the industry requirement is not only a costly exercise, but one that can be a particularly demanding task for managers. Later in Section 2.5.5, the concept of boundary spanning will explore how judicious use of internal and external human resources can help build and develop competitive advantage at a far lower cost than traditional marketing approaches.

Garvin (1988) recognises that the development of new assets that are properly strategically coordinated, such as directly linking customer experience with product or service innovations can be

a source of competitive advantage. Zahra & Nielsen (2002) emphasise that human resources internal and external to the firm should be jointly deployed in the development of new innovations and products. As the firm evolves and develops, co-specialisation of assets and resources may well develop (Teece, 2009). Particularly in the case of the SME, relational competencies develop and become more valuable in combination than they are if individual. For example, this concept has been well documented for companies such as Southwest Airline and Singapore International Airlines (Heracleous, Wirtz & Pangarkar, 2006)

To change, or be different, the firm must use two crucial capabilities: anticipate (or spot early) a change in the industry, and secondly, quickly manage the speed of reaction to that change (Grant & Jordan, 2012). An essential requirement of being able to anticipate change is having prior knowledge or information over the firm's competitors and being able to identify that an effective "early warning system" is "...through direct relationships with customers..." according to Grant & Jordan (2012, p. 176). The early warning of competitors' actions is a critical knowledge conduit to develop in SMEs. One of the ways to create 'early warning' capabilities is through knowledge accumulation through close contacts with customers. The development of this capability requires boundary spanning in some way, and then a routine that can extract knowledge and make some meaningful use of it. The reason firms engage in boundary-spanning activities is to gain knowledge or expertise that do not have themselves. The literature discussion now continues with knowledge as a capability with the firm that is fundamental to the creation of the VRIO resources required for competitive advantage.

2.4 The Knowledge-based View

From the mid-1990s, there has been a resurgence in interest focussed on the interaction and cooperation between organisations in strategic management, information systems and technology fields. Central to the emergence was the important contributions made by the knowledge-based view (KBV). The specific focus of the KBV was to highlight the importance of the core issues facing organisations in their competitive environments. While the RBV and dynamic capability view focussed on the specific actions of organisations. The KBV, in contrast, concentrates on knowledge rather than tasks as the basic unit of analysis. Dynamic capabilities have their foundations in learning, whether it is internal or external (Easterby-Smith & Prieto, 2008; Zollo, Bettinazzi, Neumann, & Snoeren, 2016; Zollo & Winter, 2002). The KBV view of the firm is an extension of the RBV and is regarded as the most strategically valuable resource in the firm by Grant (1996a, 1996b; 2012). The scholarship on KBV has primarily focused on knowledge creation, retention and transfer. A similar path of discussion will follow in this section.

Knowledge is regarded as an essential asset to the firm, and organisations have striven to maximise its value as much as possible (Tseng & Lee, 2014). Managing knowledge across boundaries is

becoming increasingly important for firms of all sizes in a rapidly changing environment, globalised markets and fast-paced technological development (Tell, 2017). The integration of knowledge across borders facilitates a cost-effective and novel way in which SMEs can gain access to valuable market information. Knowledge integration has been defined by Berggren et al. (2011) as being a purposeful combination of specialised and complementary knowledge to achieve specific tasks. Knowledge integration across boundaries required the purposeful activity of competent actors (Tell, 2017). The integration of specialised knowledge implies bridging a cognitive gap between the firm and the environment, and that the firm knows the knowledge it should acquire, and then do something sensible with it. A better understanding of the knowledge integration process could be gleaned from the study at the individual worker level of analysis, rather than the group or team level, according to Bredin et al., (2017). The critical role of the individual worker in knowledge integration and codification is also recognised by Enberg et al. (2006). Such individuals who span the boundaries between the firm and the market contribute to knowledge integration are critical to its future prosperity (Grant, 1996b). The influence of boundary-spanning activities will be discussed further in Section 2.5.

One of the critical challenges to knowledge integration facing firms is to combine their tacit knowledge which can be accessed from their organisation with new knowledge from boundary spanning (Tell, 2017). To better understand how knowledge can be used effectively, the discussion continues with the nature of knowledge and how it is related to VRIO resource building in the organisation. Also, from this point onwards, references to knowledge management (KM) will be used interchangeably with the KBV.

Knowledge management (KM) and the KBV also addresses the process of value and resource creation where learning processes have asserted themselves as critical factors in the achievement of long-term success. For firms that seize new market knowledge in turbulent markets while building on existing tacit knowledge are more likely to enter new markets and identify new trends more successfully than their competitors (Hughes, Martin, Morgan, & Robson, 2010). It is in this area that dynamic capabilities help to facilitate and guide the evolving nature of the resources and capabilities (Teece et al., 1997; Tushman & O'Reilly, 1996; Villar et al., 2014). The creation of new products and the development of new technological skills are increasingly required to drive competitive advantage (Tidd & Trewhella, 1997). While it is difficult for a small firm to be in such a position, Rogers (2004) shows that SMEs can have advantages if they are agile and flexible.

Through continuous change and morphing (Rindova & Kotha, 2001), and adding unique and novel resources to the firm's base, the RBV and dynamic capabilities provide a framework to track systematic changes that contribute to the unique value of the company through knowledge generation (Fainshmidt et al., 2016). The link between the RBV and KM (KBV) has also been acknowledged

by Nonaka and Takeuchi (1995) and again more recently by their work on ‘synthesised’ knowledge within the firm (Nonaka, Hirose, & Takeda, 2016). The basic idea is that firms create new knowledge to solve problems and generate solutions that can reconfigure internal resources in the firm (Ambrosini et al., 2009). How can this be achieved? Section 2.4.2 following looks toward managerial agency as one possible method.

2.4.1 Knowledge Management Practice

Knowledge management and learning processes have come to be regarded as significant factors in achieving long-term competitive advantage (Villar et al., 2014). Although the literature has concentrated on large organisations, the fundamental principles are still relevant at the SME level. Superior knowledge management has also been shown to facilitate higher performance amongst exporting companies (Cadogan, Diamantopoulos, & De Mortanges, 1999; Cadogan et al., 2002). Moreover, firms operating in turbulent or high-velocity environments which embrace knowledge management are more capable of identifying new trends and successfully entering new markets (Hughes et al., 2010).

Although the terms “knowledge” and “management” are old constructs in business research, their combination to form a newer construct of knowledge management is only a few decades old (Alvesson & Karreman, 2001). In their concise treatment of knowledge management, Alvesson and Karreman (2001, p. 998) suggest that the firm should “...focus on the creation and distribution of knowledge...” Knowledge management practice consists of individual abilities, knowledge management systems and general know-how that has been “...implemented in a firm-specific way to enable the performance of distinctive activities...” (Alegre et al., 2013, p. 4). These practices can be described in terms of the firm’s operational capability and its competencies in knowledge storage and dissemination (Tallman, Jenkins, Henry, & Pinch, 2004). The routinisation of knowledge management can be grouped into its creation and then operationalisation as a resource in the firm (Spender & Scherer, 2007).

Organisational practices are also closely linked to learning and the RBV, and so the link between them is apparent in the literature. However, what is not clear from empirical studies is the role of foundations in the building of internal knowledge from the firm’s cumulative experience (Alegre et al., 2013). Similarly, external learning through the interaction of the firm with its environment is also scarcely debated in the literature (Bapuji & Crossan, 2004). The continuous interaction between organisational practices, knowledge generation, and resources and capabilities underpins the renewal of routines and hence competitiveness (Grant, 1996b).

Recent interest in how dynamic capabilities are developed has considered how knowledge generation and organisational learning can influence their development (Tallott and Hilliard, 2016). One area of such research is in the field regarding the need for firms to embrace exploitative and explorative learning (terms defined by Romme et al., 2010). In this context, *exploitative learning* refers to improving current resources regarding effectiveness and efficiency while *explorative learning* addresses the acquisition of new knowledge for the reason of exploitation of new opportunities (March 1991; Tallott and Hilliard, 2016). Zollo and Winter (2002) recognise the importance of how learning can support the development of dynamic capabilities. They offer three mechanisms that can operate in the firm:

- *Learning through experience* – tacit accumulation of knowledge to aid decision-making and problem-solving;
- *Knowledge articulation* – the deliberate process of knowledge codification to stimulate sensing, seizing and developing opportunities;
- *Collective knowledge building through discussion* – using tacit knowledge sharing between the main workers and groups.

In the recent longitudinal study of an Irish SME, Tallott and Hilliard (2016) demonstrated that putting new insights gained into practice supported by the “...development of formalised guidelines and deliberate learning for future action...” allowed for knowledge to be “...codified and diffused throughout and adopted within the wider organisation...” (p. 5). Not only did such routines develop higher-order resources and capabilities, but they also led to the development of new capabilities more focused on customer value and customer needs. Pyo & Chung (2016, p. 216) recognise that “... organisational path dependence is a necessary condition of learning capabilities such as absorptive capacity, dynamic capability, and other intangible resources...” However, is path dependence the sole criterion for effective learning strategies? Building on tacit knowledge already in the firm through experiential learning is an alternative view that is focused at the level of the individual. Where knowledge and skills are accumulated at the level of the individual worker, then there is an opportunity for outside in and inside knowledge building. The following section 2.4.3 looks at experiential learning and its role in VRIO development in organisations.

The literature is replete with studies on the conditions in which experiential learning in businesses occurs, as summarised in Table 2.2, below. In their study of 36 pizza stores franchised from the same corporation, Darr et al. (1995) showed that knowledge acquired through “learning by doing” was found to depreciate rapidly within each franchise over time.

Cumulative learning and experience over time in companies can lead to significant advantages and be a predictor of the firm’s ability to take advantage of continuous learning in the future, according

to Pisano et al., (2001). The results of their studies demonstrated that learning by doing through cumulative experience is firm-specific and plays a central role in the adoption of new technologies. Moreover, their results also show that specific firm conditions, such as an open learning culture and supportive managers, enhanced the organisation's ability to learn and make use of knowledge gained.

Zahra and George (2002) also link the firm's absorptive capacity to the creation and sustenance of competitive advantage. In their theoretical paper, the authors suggest that absorptive capacity is a dynamic capability that determines the pathways to organisational change. Zahra and George, (2002) further indicate that firm's ability to manage knowledge influences the output gained from its absorptive capacity. The authors are essentially linking absorptive capacity with the "...firm's ability to create value, assimilate, and apply new knowledge..." (p. 186). Alegre et al. (2013), examined how knowledge management affects innovation performance within biotechnology SMEs.

The overarching conclusion from the literature is that there is a vast difference in how firms learn from their prior experiences (Alegre et al., 2013) and also from "learning-by-doing" (Darr, Argote, & Epple, 1995). The literature brings into sharp focus the challenges facing the SME in transforming the knowledge acquired through "learning-by-doing" and maintaining this knowledge as a competitive advantage and guarding against erosion over time by rivals (Darr et al., 1995). Additional challenges highlighted in the literature are the time and investment required in experiential learning (Grewal, Comer, & Mehta, 2001) and whether the performance objectives can be operationalised at a faster rate than competitors (Pisano, Bohmer, & Edmondson, 2001). Gulati, (1999) also alludes to strategic alliances (and by extension, boundary-spanning) and the ability of the firm to make correct and timely decisions with new-found

2.4.2 Learning from Internal Experiences

The literature suggests that the salient factors underpinning internal learning are the time-dependent cumulative experiences associated with organisation routines and systems (Alegre et al., 2013). Internal experiential learning is an important contributor to incremental learning, but it is only part of the solution. The other part of the answer is the "...new knowledge created and integrated within a firm through interaction with the environment and other organisations..." (Alegre et al., 2013, p.4). Experiential learning can be viewed as being a more dynamic process than simple knowledge accumulation over time in the firm. Experiential learning is intertwined with the repertoire of dynamic capabilities within the firm, and it is how the firm manages and uses the new knowledge will determine if its practices become dynamic or just become core rigidities (Leonard-Barton, 1992).

Internal knowledge within the firm must be continuously updated so that the company remains connected with its customers and ultimately, its environment. Through a process of "...knowledge creation, retention, and transfer..." the SME will have the basic component to build important

knowledge capabilities (Alegre et al., 2013, p. 4). However, knowledge creation is a grey area in the literature, and the mechanisms by which it is generated is hotly debated. One method is close customer contact, continually seeking feedback from them. If knowledge is correctly interpreted the constant renewal of capabilities to meet market changes can be an important asset, and a pivotal contributor to knowledge influenced dynamic, or non-dynamic change. It is through the efficient diffusion of knowledge across the border between customer and supplier that the SME is typically able to compete with rivals who have much more significant resources and thus managing this knowledge is very important to SMEs regarding allowing them to “stay in the game”. Section 2.4.5 now discusses learning across boundaries and the importance of external experiences in the creation of important VRIO resources and dynamic capabilities in SMEs.

2.4.3 Learning from External Experiences

One of the key methods available to the SME in the accumulation of knowledge is through strategic alliances or external specialist assistance. Cohen and Levinthal (1990) refer to the firm’s “absorptive capacity as the ability to identify” and acquire new knowledge, absorb, and then exploit it. This capacity *must* be reflected in the company’s capabilities and how it focuses on the “...creation of knowledge and the long-term knowledge objectives of the firm...” (Alegre et al., 2013). In the SME, knowledge often remains in tacit form and is often retained at the individual level (Wong & Aspinwall, 2005), so the creation of a formal structure of knowledge storage becomes a challenge for the smaller SME (Villar et al., 2014).

Bapuji and Crossan (2004) and Villar et al. (2014) situate internal and external learning as *competencies*, presumably referring to the firm’s ability to use transformational knowledge to reconfigure internal processes and practices. The critical importance of the firm’s ability to combine new and existing knowledge and use it in the process of innovation in enterprises is recognised in the literature (for example, Chang, 2003; Ettlie & Pavlou, 2006; Winter, 2000). The continuance of knowledge creation is pivotal to change and competitive advantage which is supported by ample empirical evidence in the literature (Nonaka, 1994; Nonaka et al., 2016; Nonaka & Takeuchi, 1995). Knowledge management in SMEs is undoubtedly a challenge because knowledge is often managed on an ad-hoc basis, with no formal knowledge management systems (Alegre et al., 2013). Thus the competencies and the role of an individual(s) becomes more pivotal in turbulent environments; an area of the literature that is also neglected.

As seen in other fields of research within the strategy and firm operations, already discussed in this review, the recent literature on knowledge management has focused primarily on larger firms, neglecting almost entirely the issue in SMEs (Hutchinson & Quintas, 2008). In their study of 43 firms (of which 13 were SMEs) Huthinson & Quantitas (2008) found that SMEs do indeed mostly

manage knowledge informally. The small number of SMEs that were more knowledge “sensitive” were found to be more aggressive in their growth and internationalisation strategies (Bell, Crick, & Young, 2004). While the study was welcome in its focus on SMEs, a more rigorous and in-depth analysis over an extended period would have been more illuminating. Moreover, strategic thinking and planning were more evident in firms that were supported by “external advisors and non-executive” directors and who were also “knowledge-intensive” (Bell et al., 2004, p. 45). Thus, the firm can be considered to possess *internal* and *external learning capabilities* as two dimensions of its knowledge management influenced capability building.

Of relevance are the capabilities developed in the SME to take advantage of external learning. Sadly, much of the body of literature does not operate at the boundaries of knowledge transfer between the firm and customer base but instead prefers to discuss knowledge management in abstract terms of intangible assets (Spender & Scherer, 2007). However, it does recognise the need for effective and efficient processes to facilitate the transposition and creation of tacit and implicit knowledge within the firm and between co-workers and boundary agents (Becerra-Fernandez & Sabherwal, 2001; Nonaka, 1994). The literature also lacks sufficient rigour in the study of knowledge management in SMEs in turbulent markets from the RBV and dynamic capability viewpoints (Alegre et al., 2013). This section discussed the importance of knowledge management regarding the firm’s internal resources and knowledge capabilities. In the next section, external learning capabilities are discussed and how that can be achieved using boundary agents (‘boundary spanners’) as a means of addressing the gap in scholarship for the SME sector.

2.4.4 The role of partnerships in competitive advantage in SMEs

Empirical findings in this area of partnership building scholarship have been decidedly mixed (For example, Amaldoss, Meyer, Raju, & Rapoport, 2000; Bleeke, Ernst, & Ernst, 1993; Chan, Kensinger, Keown, & Martin, 1997). The majority of SMEs who chose not to embrace partnership are those most in self-reliant industries (Li & Qian, 2007). Gomes-Casseres (1997) reports that self-reliant firms generally conduct business mainly through internalisation, which is the practice that commercial activities are conducted in “markets” that are controlled through common ownership. On the other hand, technology-based SMEs show a greater propensity to forge a partnership than their counterparts in more traditional industries. Presumably, this is because of the higher sunk costs needed for technology start-ups.

Another reason that SMEs who look to partnerships for product development is not particularly successful is because of the extended time required for product developments (Li & Qian, 2007). Thus, product innovation and product replacements are less frequent. If their products can be

duplicated faster than the SME can innovate, the SME is in danger of losing market share, reduced profits, or both. If the SME's resource base and product features and attributes no longer satisfy the conditions of VRIO, it is difficult to survive strong competitive forces. The empirical research suggests that SMEs tend to focus more on their home markets where their resources can be supported longer because of home brand loyalties. In this case, the SME does not have to manage diversities in export markets and thus require fewer resources to compete. Establishing a firm base in the home market reduces exposures and risks associated with SMEs operating in international markets. Conversely, another consideration is that the home market is not large enough to sustain a suitable profit and market growth for the SME (Li & Qian, 2007; Valença, Alves, & Jansen, 2018; Yarrow & Prabhu, 1999).

This fact is well noted by Gomes-Casseres (1997), smaller SMEs tend to avoid partnerships, but instead rely on alliances. At the larger end of the SME spectrum, they are more likely to forge partnerships. Smith and Laycock (2005) conducted a study as part of the London Knowledge Network and concluded that effective knowledge-focused strategies through collaboration and networks within and between organisations enjoyed consistent growth. There is also a parallel stream of scholarship that acknowledges the roles of boundary-spanning teams as a proxy for knowledge gathering and sales team learning (Rangarajan, Chonko, Jones, & Roberts, 2004).

SMEs tend to develop close, trust-based and long-term relationships with suppliers, dealers and customers (Pérez-Cabañero, González-Cruz, & Cruz-Ros, 2012). The research also shows that SMEs tend to develop close, trust-based and long-term relationships with suppliers, dealers and customers as a means to remain competitive (Sirmon & Hitt, 2003).

An emerging paradigm in building on, and connecting with, relationship building between customers and their suppliers is the notion of Key Account Management (KAM). Building on the foregoing discussion, KAM recognises that in challenging market conditions demand embracing transformational changes to remain competitive (Beck & Wiersema, 2013). Section 2.5. discusses the current thinking on KAM for building and sustaining competitive advantage through the establishment of valuable long-term relationships with customers (Tzempelikos & Gounaris, 2015). The connections between KAM and the RBV was recognised by Barney in 2014, who noted that a 'rich conversation exists between both constructs' (Guesalaga, Gabrielsson, Rogers, Ryals, & Cuevas, 2018). It is in this context that Section 2.5 continues that conversation.

2.5 Key Account Management in the context of the RBV

In their rigorous meta-analysis of research related to KAM, Gounaris & Tzempelikos (2014) have exposed a noticeable change in managerial practice towards building longer-term relationships with business-to-business (B2B) customers. The review also highlights that the B2B approach demands stronger organisational commitment of workers and firm resources than is necessary for relations based on simple transactions. So that strong and long-lasting relations are nurtured, "...organisational commitment and change must occur on both sides of the dyad.." (Frankwick, Porter, & Crosby, 2001). An emerging theme in KAM theory is that it is a process that evolves dynamically over time and "...featuring distinct transition stages for roles, skills, processes, and resources..." (Guesalaga et al., 2018, p. 160).

Earlier scholarship has identified a link between RBV where bundles of resources and capabilities in the firm underpin the critical KAM processes (For example, Guesalaga et al., 2018; Homburg, Workman Jr, & Jensen, 2002). Thus, the remaining part of this section will analyse the extant KAM literature through the lens of the RBV. As mentioned in section 2.2, the RBV offers a useful framework how the firm develops a competitive advantage and how that links to the firm's performance using its bundles of resources and capabilities (Barney, 1991; Barney & Clark, 2007). These bundles of assets can be tangible and intangible and are used by firms to formulate their strategies to achieve a competitive advantage (Amit & Schoemaker, 1993). Within these intangible assets is where a connection with KAM is made through customer relationships. If the customer relationship can satisfy the conditions of VRIO, then they form the basis of the assets and resources that firms use can use to obtain competitive advantage (Dyer & Singh, 1998).

The development of strong customer relationships can involve socially complex resources, often involving a level of mutual trust. These may involve many years of nurturing and will likely have been built on a mutual valued-based structure; a relationship that is a "win-win" for both sides. In terms of the RBV philosophy, imitation of the relationship may be both challenging and costly to replicate by competitors (Prahalad & Hamel, 1990; Prahalad & Ramaswamy, 2004). Thus, it could be argued that resources and capabilities include all aspect of management (from operational to key-account malmanagement) but also organisational resources and capabilities in the context of KAM (Guesalaga et al., 2018).

To make a clear connection between KAM, RBV, KM and indeed, dynamic capability theory, there must be clarity between the definitions of a resource and a capability. In section 2.3.4, the definitions were made explicit by Helfat and Peteraf (2003, p. 999) – now repeated here for convenience:

- **a resource** is “*an asset or input to production (tangible or intangible) that an organization owns, controls, or has access to on a semi-permanent basis*”, and
- **a capability** is “*the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result.*”

Using this perspective, section 2.5 will conclude with a critical synthesis of the primary literature streams discussed in the foregoing to this point. An exploration of how KAM, knowledge generation and capability development can coexist to underpin competitive advantage through the RBV lens continues. Abratt and Kelly (2002), in their survey of 92 suppliers and 98 key account customers showed that a thorough understanding of the firm’s market and nature of the businesses of key account customers is a fundamental success factor in both long-term relationship and KAM; an approach long associated with the success of Dell Computers. This also resonates with Ryals and Rogers (2007) where in-depth end-user knowledge can help anticipate their future needs and facilitate a strong customer focus in the firm. The net result is a successful KAM plan that facilitates ever closer and stronger relationships between customers and suppliers. Thus, as making it more difficult for rivals to ‘break in’ and, capture some or all of the value from the customer.

2.5.1 Merging KAM, KBV and RBV

The clear distinction between a resource and a capability offers an appropriate platform to study KAM, and the management of assets (e.g., people, processes) and the ability to undertake specific tasks and processes (e.g., customer selection, business development) and the knowledge accumulation (organisational learning, sensing, seizing, reconfiguring). In keeping with the preceding discussion on RBV and dynamic capability theory, the conceptual model which is later discussed in Chapter 3 will adopt the classification of tangible/intangible resources and operational/dynamic capabilities concerning their primaevial foundations in RBV, which I believe more closely reflects the nature of both KAM theory and the KBV.

The classification of capabilities in terms of them being operational or dynamic is widely adopted in the strategic management literature (For example, Achtenhagen, Melin, & Naldi, 2013; Ambrosini, Bowman, & Collier, 2009; Barrales-Molina, Martínez-López, & Gázquez-Abad, 2013; Barreto, 2010; Easterby-Smith, Lyles, & Peteraf, 2009; Easterby-Smith & Prieto, 2008; Eisenhardt & Martin, 2000; Helfat & Martin, 2015). As discussed in the preceding section 2.4.3, capabilities are classified as either being operational or dynamic. It will be remembered that operational capabilities constitute the building blocks of the process needed to accomplish tasks, whereas dynamic capabilities involve higher-level activities that enable more significant payoffs (Teece, 2014). Relating this notion to KAM and the RBV, operational capabilities could involve developing cross border relationships to

address technical deficiencies in the firm, establishing key account customers, strategic relationship building and KAM programmes that underpin competitive advantage. This list is not exhaustive. Likewise, "...an example of a dynamic capability in the KAM field is the adjustment of KAM processes to suit new market trends, and the reshaping of customer relationships..." (Guesalaga et al., 2018, p. 162). However, an integral part of a successful KAM strategy is dependent on the effectiveness of the firm's sales interface with the customer, the knowledge generated and assimilated, and the decisions and actions taken that will lead to the correct dynamic capabilities and VRIN resources.

KAM has been highlighted as a significant area of academic research (Leigh and Marshall 2001, Workman et al. 2003) and both managers and academics alike are of the view that suppliers need to develop long-term relationships with selected strategic customers. In response to this, the following section looks at the interface between the supplier and the customer.

2.5.2 The interface between supplier and customer

According to Ryals and Davies (2010), company managers and CEOs invest more than ever in their sales forces, without realising the benefits. The authors observed 800 sales professionals in live sales meetings to understand the gaps and disconnections. The findings revealed eight types of salespersons categorised by types of behavioural tendencies and not specific personalities. Of the eight observed types, three of them (37% of the total number) were consistently effective. The eight categories were: socialisers, aggressors, narrators, product-focused, storytellers, consultants, product-closers, and experts. While a detailed elaboration of each of the categories is beyond the scope of this study, a concise overview (Table 2.3) and a brief discussion are still pertinent. The relevance to this study is that the case-study SMEs sell a technical product to a professional educator, where the salesperson must have a level of technical competence, or they are unlikely to succeed.

Moreover, where boundary spanners compensate for the lack of specific skills in the SME, there is still a need for there to be technical competence in the sales team to support the boundary spanners. For example, if a boundary spanner conducts a workshop session for educators, the emphasis is on the practical aspects of the products. The lack of 'geeky' knowledge of the boundary spanner can be compensated then by the technical salesperson in the supplier firm. Hence, so that activities of the boundary spanners are utilised to the full by the firm, the salespersons employed to follow up the activities of boundary spanners must be competent to the customer.

In most non-technical firms, the 'Product-Closers' are the outstanding salespeople capable of securing huge deals, usually in product sales. They are characterised as being persuasive, responsive, and effective at countering customer objections. Often their presentations are professional but

accompanied by a 'smoothness' that can be objectionable and overwhelming. However, in some industries, this approach is ineffective if it is the only approach. In other sectors, such as the IBM study by Ryals and Davies (2010), the 'product closer' is only useful if they follow up with the customer after the visit of the technical salesperson.

From the group of salespersons analysed by Ryals and Davies (2010) 'experts' should be retained at all costs by management not only as key salespeople but to mentor the less effective salespeople. The next important category was that of the consultant, whose skills were to build rapport and with the customer early on. In the context of this study, the 'consultant' is the boundary-spanner.

Table 2.3 following presents (just for completeness of the argument a summary of the different sales professionals as identified in the Ryals and Davies (2010) study.

2.5.3 Signature Processes and Firm Special Advantages

Signature processes was a term first coined by Gratton and Ghoshal (2005, p. 50) and define them as "...processes that have evolved internally from executives' values and aspirations, and the term best practice for ideas developed outside the boundaries of a business unit or company..." However, there is a distinct, but subtle, difference between industry best practices and "...intriguing practices and processes in many of the high-performing companies..." (ibid, p.50). In other words, best practice processes are not alone sufficient to bring competitive advantage, but highly idiosyncratic processes that are value-laden can and do. In their study of three large corporations in the retail banking, high-tech and oil distribution, the high performers embraced signature processes that mirrored the values of the organisation.

Heritage assets on which a firm has built its reputation may include capabilities such as managerial styles, administrative competences or customer responsiveness to name a few. Kano and Verbeke (2018) more precisely define heritage assets as those that can include the firm's product ranges, relationships with suppliers and customers, or any asset that is synonymous with the firm that confers a special treatment. For example, Apple enjoys a loyal customer following and has also a heavily vertically integrated supply chain competitors have tried to replicate. Arikan, Koparan, Arikan, and Shenkar (2019) in their study of the dynamic capabilities of internationalisation, suggest that heritage assets are often the antecedents of firm specific signature processes. They are well honed key routines traced back to the firm's inception and, often the founder's vision, that have set them apart and has been part of the value capture of the firm.

Signature processes appears in the strategic management literature in various guises in relation to their role in underpinning VRIO resources and in creation of dynamic capabilities. Referring back to the original mission and vision of the firm, Gratton and Ghoshal (2005) take the view that signature processes originate in the organisational heritage of the firm's values and goals and are dynamically adapted over time. Teece (2014) expands our understanding of signature processes in that they are intrinsically linked to the firm's organisational culture and are manifested through its practices and routines. Moreover, Teece (2014) insists that signature processes crafted through creativity, experience and firm's historical reputation can make it hard for rivals to imitate.

In summary, signature processes are not just best practices, are an important aspect of a competitive advantage through development of activities and actions adopted by the firm that reflect their values to their customers. For example, the former tech giant, Nokia, espoused the Finnish values of respect for the individual and to allow them to bring their creativity and develop their own competencies. Indeed, Teece (2014, p.14) suggests that "... The (dynamic) capabilities framework is an entrepreneurial approach that emphasizes the importance of (signature) business processes, both inside the firm and also in linking the firm to external partners..." Thus, dynamic capabilities rely on signature processes that are also VRIN resources (Teece, 2014).

Table 2-2 – Overview of the eight sales behavioural tendencies (L. J. Ryals & Davies, 2010)

Socialisers	Aggressors	Narrators	Product Focused	Storytellers	Consultants	Product-Closers	Experts
A ‘tea and biscuits’ salesperson happy to chat with customers about social topics such as cars, holidays and children.	Hard-bargaining, table-thumping types who go into a sales meeting expecting a price negotiation.	Clings desperately to the marketing materials because of lack of confidence.	Distinctly product- or technical focus with little or no discussion on applications of product.	Tend to have longer-than-average sales meetings they think they can win by telling just one more story.	Quickly builds a rapport with customers.	Very good salespeople who may pull off some very big deals, usually in product sales.	Most effective in sales meetings and, what is more, they make it seem effortless.
Spend far too much time in sales meetings on chit-chat, perhaps using this activity to avoid having to cut to the chase and get down to actual selling.	Brag about their (few) wins to colleagues but will fail to mention the customers who ran for cover when they saw these salespeople coming.	Sales ‘script driven’, so they tend to be weak at responding when customers challenge or ask them questions	Insist on detailing every single product feature whether or not the customer is interested.	This can result in ‘talking through the sale’ and losing the business	Exhibit effective problem-solving sales behaviours and are good at listening to customers and developing a solution that meets their needs.	They are persuasive, responsive, and effective at countering customer objections.	They do not seem to attract the customer objections that <i>Product Closers</i> do

2.5.4 Sales Training Strategies in Tech Companies

The following brief discussion builds on the characteristics and traits of successful sales professional in specific business environments from Ryal and Davies (2010). The main argument that follows is that firms, large or small, need to carefully address the special needs to the customer base when selecting and training their professional salespeople. Since this study is concerned with the sale and promotion of a technical product, the following discussion references some suitable exemplars from the literature.

The smaller SMEs do not have the luxury of a range of salespersons, and instead often have to settle for those that are not attracted, suitable for higher-powered positions in the IBMs of this world. In the case of an SME operating in a technical market where expert advice is required and post-sales support and training, that gap needs to be filled by other means. It becomes a matter of competitive advantage against better-resourced rivals. The preceding brief discussion from the research of Ryal and Davies (2010) has relevance to this study because it brings to light the unique requirements of the SME and the requirement that the sales professional should complement the boundary-spanning activities.

Turbulence in the business environment due to changing technologies has forced companies to reconsider their selling approaches and sales strategies (Avlonitis & Panagopoulos, 2010). Over time the role of the sales force has diversified in technology-based companies as they try to identify new ways of attaining a competitive advantage (Ciulu, 2010). In the case of Google, they have a hard-to-imitate resource of being able to manage their people effectively unlike other companies, which rely on trust and relationship in people management, resulting in a source of both differentiation and cost advantages. Google achieves this through the use of data about its employees which is used to significant effect to manage them. This capability allows making correct (data-based) decisions about which people to hire and the best way to use their skills (Rothaermel, 2016). The net result is that Google employs and manage workers who are highly productive and innovative. Thus, in the tech arena, Google recognises the special skills that their employees need to make a connection with a more tech-orientated customer.

The main conclusion from the exemplars just discussed, is that a firm that is engaged in a technically orientated market needs to pay careful attention to the type of salesperson selected. The section also brings into focus the restraints on SMEs in training resources, or even attracting the brightest talents. The SME, therefore, needs to look towards relationships and partnership that can compensate for

their lack of technically orientated resources. One such method is to seek expertise and knowledge from outside of the firm. One such way is through boundary spanning.

2.5.5 Boundary Spanning and Knowledge Generation

There is an established and well-defined body of scholarship relating to boundary-spanning functions in the management literature (Hespo, 2008). Allen and Cohen (1969) define the activity of boundary spanning as a process in which firms identify, sense and accumulate knowledge and information on developments or market intelligence that is outside of their professional expertise. The complexity of boundary spanning is reflected in the requirement for the individual(s) to possess technical competence as well as the ability to learn and communicate social knowledge about customers, markets and technologies (Van de Ven & Zahra 2016). It comes as no great surprise that the areas of management such as sales and marketing management, customer relationship management, joint product developments and technology transfers dominate the empirical studies in this academic area (Gooderham, Zhang, & Jordahl, 2015).

The reason why organisations engage in boundary spanning is for reasons just stated in the previous paragraph. Whatever the operational reasons might be, they all have a single aspect in common – that is, boundary-spanning involves knowledge transfer and creation of some kind. However, there still exists a significant gap in the literature that combines the constructs of KM (KBV), KAM and the RBV across boundaries. The existing body of scholarship on boundary-spanning has focussed on understanding how organisations create value from the perspective of the consumer. Prahalad and Ramaswamy (2004a) have questioned this organisation-centric approach and proposed a value framework that is co-created between organisation and consumer. Organisations operating in the modern environment are facing increasingly complex challenges regarding global competition, changing economic conditions, and technological change, with the resulting task complexities confronting the individual worker (Marrone, Tesluk, & Carson, 2007). Research that highlights the increasing need for firms to reach across boundaries to seek independent skills to complement internal organisational skills is becoming a rapidly growing area of study (Mohrman et al., 1995). This emerging field of the literature establishes a definition that is about managing external linkages across or between the customer and organisational boundaries. The motivation for boundary spanning might be for different reasons often found in the combination of some sort, for example, firm innovation (Hargadon, 1998); seeking external expert assistance (Ancona & Caldwell, 1992, 2009); or strategic alliances (Faraj & Yan, 2009). However, despite the emerging empirical research over the last two decades, a fundamental understanding of the factors that facilitate boundary spanning is still elusive (Choi, 2002; Joshi, Pandey, & Han, 2009). Likewise, the mechanism

whereby knowledge is transferred and assimilated at the level of the individual remains underdeveloped.

A wide range of activities can be classified as actions carried out under the category of boundary spanning. The literature has been concerned with teams of individuals engaging in boundary-spanning activities to gain access to resources and support and scanning the environment for information and knowledge (Joshi et al., 2009). In larger companies, boundary spanning is viewed as a team coordination activity and can be categorised as being of an ambassadorial or a management function (Ancona & Caldwell, 1990). However, in SMEs, those functions coalesce into a single process, and view boundary spanning as the “...process by which organisational *actors* sense, identify, learn about, and gather information on developments outside their domain of experience..” (Van de Ven & Zahra, 2016, p. 242). Thus, in RBV terms, boundary-spanning converges the actions of KM, absorptive capacity and the integration of knowledge through the agency of the individual boundary *agent* through the process of boundary spanning.

The influence of antecedents in both small and larger firms is recognised as influential in its external interaction as well as the effectiveness of the firm’s boundary-spanning efforts (Joshi et al., 2009). The significance of the boundary agent involved in boundary-spanning has been shown by empirical social research to exert a strong influence on the relationships that are built and nurtured with customers (Joshi et al., 2009; Kilduff & Tsai, 2003). Moreover, the boundary agent’s “...education and value-based similarity to team members predicted centrality in advice and friendship networks within the team...” (Joshi et al., 2009, p. 740). The body of literature on boundary-spanning focuses, for the most part, on teams of individuals operating in larger firms. Thus, there is a significant deficiency in the literature, ignoring the unique challenges of SMEs. However, a commonality of approaches towards antecedents such as organisational structures, culture and economic climate to boundary spanning is also relevant to SMEs (Kilduff & Tsai, 2003; Klein & Kozlowski, 2000; Klein, Lim, Saltz, & Mayer, 2004; Tsai, 2002).

What the literature does tell us, which seems applicable also to SMEs, is that boundary-spanning activities can be through formal, or informal arrangements and a wide variety of mechanisms (Van de Ven & Zahra, 2016). The empirical research suggests that knowledge acquired by boundary agents is usually tacit (Nonaka, 1994). However, there is no evidence of empirical research in SMEs about the precise mechanisms of knowledge transfer, and indeed how the firm can be safeguarded when knowledge is not passed between co-workers. If this situation arises, then typically, it is because there is no formal system and process internally that sets about capturing and formalising such tacit knowledge, they “...do not know why, or to whom, the information matters...” (Van de Ven & Zahra, 2016, p. 242). So, the need for a structured and reasoned approach is evident, and the resources and capabilities that allow SMEs to sense, seize, translate and share the acquired knowledge is a basic

set of capabilities for the senior management to develop. The literature is replete with empirical studies of large organisational embedded routines and team level boundary spanning (For example, Ancona & Caldwell, 1990; Carlile, 2002; Hsu, Wang, & Tzeng, 2007; Marrone et al., 2007; Van de Ven & Zahra, 2016). The literature, however, falls short of addressing boundary spanning at a more micro-level, and therefore the understanding of boundary spanning in SMEs with limited resources has been lacking.

The explicit connection between VRIO resource building and the contextual factors that influence the conjoining of the SME and boundary spanning activities is also absent from the literature. Transferring knowledge across the boundaries is “unproblematic” if the managers in the firm and the boundary agent share “...a common syntax and lexicon...” (Carlile, 2004, p. 558). The discussion now continues with the specific role of the boundary agent in the context of the SME.

2.5.6 The Role of the Boundary Agent in SMEs

Allen (1977) categorises the individuals who are involved in boundary-spanning activities as collectors, brokers or diffusers of knowledge. Most boundary spanning studies focus on the human agent as the main unit of analysis, their social interactions and their ability to translate knowledge across boundaries. In a study by Subramanian et al. (2013), the role of a specialist individual was examined acting in the role of a boundary agent between a university and a biotechnology firm. The study showed that suitably qualified biotechnologists spanning the borders between the university and firm are especially effective in integrating the knowledge necessary to develop successful patents. However, the study would have benefited from being more longitudinal and multi-case to elucidate antecedent factors. Specialised knowledge of boundary agents as a critical factor in R&D projects has attracted considerable attention in recent years (Berggren et al., 2011). The unit of analysis in prior research has been at the level of the project team or consulting project teams, but sadly neglects the micro-unit of analysis at the level of the individual (Bredin et al., 2017; Zika-Viktorsson & Ritzen, 2005). This is an important gap in the literature regarding SME boundary spanning at the level of the individual worker. (Bredin et al., 2017).

The selection of suitable individuals to act in the role of boundary agents builds from two main streams in the literature:

- First, the required skills related to the knowledge disciplinary domain (disciplinary knowledge), and,
- Second, the complementary skill capabilities within the firm with whom the boundary engages (i.e. supportive knowledge) (Bredin et al., 2017).

While the literature recognises the organisation’s ability to change as a mediating factor for new skill creations (Breu et al., 2002; Muduli, 2013; Sherehiy & Karwowski, 2014; Sherehiy, Karwowski, &

Layer, 2007), the literature is sparse in its treatment of the relationships between disciplinary and support knowledge, how they interact and complement each other. The empirical boundary-spanning literature suggests that there are often trade-offs between maintaining a high degree of contextual depth of knowledge of the boundary agents and the agility in the firm (Bredin et al., 2017). In the case of the SME operating in a niche market, the interface with boundary agents is conducted more on an individual basis and thus not subject to the complexities of larger project teams. The element of trust between boundary agent and SME is also important and is emphasised by Zhang (2018).

Thompson (1967) suggests, in his theory of organisations, that the firm can be isolated from exogenous market shocks by "...boundary-spanning units to buffer or level environmental fluctuations..." (p. 67). These units, in turn, have the "...responsibilities help determine the structure of input and output units..." (p. 67). If taken in the context of value generation for the firm, the contribution of boundary spanning can have a real influence on the development of the important resources for value creation and capture. Thompson (1967) further argues that the extent of the engagement of boundary spanning activities by the firm is reflective of the importance placed on 'adjustment or adaptability' by managers. Thompson (1967, p. 71) is forthright in his assertion, through his 'Proposition 6.2' that the more the alignment that is needed between the firm and its environment the more the reliance on more specialised boundary-spanning activities:

"...Proposition 6.2: Under norms of rationality, boundary-spanning components facing homogeneous segments of the task environment are further subdivided to match surveillance capacity with environmental action..." (Thompson, 1967, p.71).

Organisations are composed of and embedded with, 'systems of action' that are interdependent (Thompson, 1967). The 'systems of actions' referred to by Thompson could be interpreted as routines, processes and capabilities, that, crucially may not be exclusively housed inside the firm. Thompson recognises the requirement for 'adjustment' to be made by the organisation to the new "constraints and contingencies" not under the control of the firm are necessary (pp. 66-67). If the goal of the SME is to achieve a more significant share against rivals, the canons of rationality norms inform the organisation's managers must safeguard their 'technical cores' to achieve their aim. Every firm or organisation has a technical core that can support a competitive position in the market, provided that is not eroded by competitors, or rendered useless because of technological advances. Thompson (1967) propositions that boundary spanning units need to develop a buffer to protect the 'technical core' against environmental fluctuations from increased market volatility or increased levels of competition.

On the specific point of boundary spanning, Thompson (1967, p. 70) propositions that the amount and degree of complexity of boundary-spanning activities will be reflective of the focus and importance the firm places on its own “adjustment and adaptability”. In order that the firm adapts and adjusts in the right way, the dangers posed by bounded rationality must be minimised. If the engagement in boundary-spanning activities is the achievement of a limited degree of bounded rationality, then a focussed approach to support accurate decision-making is suggested by Thompson (1967). In the context of this study, bounded rationality refers to decision-making by managers being limited by the information they have to hand. The rational choices made are also confined by the cognitive limitations of their minds, and the finite amount of time they have to make a decision. Thus, rationality is consequentialist, and it is concerned with outcomes based on knowledge received and acted upon. Thus, the importance of having well-managed KM processes that align with adept KAM procedures that are, in turn, aligned with boundary-spanning activities, becomes apparent. Thus, as described in Thompson’s proposition 6.2 above, there is a tendency for organisations operating across complex boundaries facing heterogeneity, may decide to form specialised boundary-spanning groups.

The inference from Thompson (1967) is that the “... more dynamic the task environment, the greater the contingencies presented to the organization...” (p. 73). However, Thompson makes another valid observation: “...the more constraints and contingencies the organization faces, the more its boundary-spanning component will be segmented...” (p. 73). The important implication for this research study is that the more the complexity in the environment and the more it experiences change, the more complex will be the boundary-spanning activities. In the case of the SME, a level of protection is possible in a niche market that experiences some degree of change, simply because of its specialist nature. This is because a larger rival would experience great difficulty in managing the different boundary-spanning groups and sub-groups without the specialist knowledge of the SME in a niche market. Moreover, the importance of maintaining a balance between the core activities of the firm under conditions of complexity is emphasised by Thompson (1967, p. 74):

“...extent to which technical-core-and boundary-spanning components can be isolated from each other, the extent to which organizations can separate their rational-model requirements from their natural-system requirements...”

In short, managers are required that the core activities of the firm should be kept separate from the boundary-spanning activities. In the SME, perhaps that is easier than for a large organisation, and one that can be used to maximum effect better by the smaller organisation.

Although Thompson is talking on much larger scales for larger organisations that are the focus of this study, the principle nevertheless is still valid. It serves to illustrate that the RBV theory (as discussed earlier) is deficient in some respects and that the incorporation of boundary spanning and instrumental and value rationality may well elucidate better the concepts of ‘value’ and ‘resource’ that are not currently clearly defined.

2.6 Research Gaps

As discussed in this section, there is some disagreement and confusion in the RBV scholarship in the following areas:

- how value is to be conceptualised or measured (gains to trade, value to owners, increases in value to owners)
- the meaning of rents
- the appropriate use of the opportunity cost concept
- whether competitive advantage means winning the game or just having enough distinctive resources to maintain a position in the game.

In Section 2.3.9, eight limitations derived from scholarly discussions in the literature were also discussed. Based on the findings of Kraaijenbrink et al. (2009), in their discussion paper, eight key points of criticism are identified that are summarised in Table 2.4 following.

Given the issues and gaps in the literature above, this study aims to investigate the influence of boundary agents on the development of VRIO resources in the SME, both from the perspective of the customer and the organisation. The literature review highlights some important gaps in the understanding of the fundamental mechanisms through which competitive advantage can be achieved by SMEs, the importance of knowledge generation and the contribution of boundary agents.

The explicit connection between resource and capability building and the contextual factors that influence the conjoining of the SME and boundary spanning activities is also absent from the literature. This study will attempt to supplement the sparse research in this area and address the call for more research into the theoretical mechanisms by which contextual factors influence a firm’s boundary-spanning activities and choices (Joshi et al., 2009).

The main gaps identified in the literature review regarding the development of VRIO resources and dynamic capabilities in SMEs where:

- The RBV is concerned with inwards looking at the firm and does not consider the demand side of the market.

- The concept of VRIO resources and organisational capabilities is predicated on the heterogeneity of competing firms, which can be extremely difficult to quantify.
- Due to the heterogeneity of the companies, it is hard to impossible to assemble a homogeneous sample for studies of impact due to VRIO resources.
- There is limited focus on capability development in the RBV, especially in SMEs.
- A limitation of the RBV framework is that the model focuses on when and how organisations collectively develop capabilities. The framework, therefore, ignores the abilities of the individual in the firm, and their essential role in generating these capabilities.
- The RBV view does not offer a clear and useful framework for the manager, or entrepreneur in either the SME or the larger firm.
- There are increasing difficulties with the definition of what is the basis of value from an objective sense.
- In general, there is a severe deficit of empirical research on SMEs, in both the RBV and dynamic capability theory literature; and,
- Finally, consideration of how under-resourced SMEs can attain sustained competitive advantage is sparse in the literature.

While, as discussed, there are generalised gaps and disagreements in the RBV domain, Table 2.4 below, provides a summary of the specific research gaps and ambiguities of the RBV that is directly related to the specific areas of interest in this study. The findings of Kraaijenbrink et al. (2009), together with the literature gaps identified in this study are comingled in Table 2.4.

Table 2-3 – Specific aspects of the RBV relevant to the study (Source: modified from Kraaijenbrink et al. (2009, p.3))

RBV issue	RBV literature/perspective	Relevancy to the study
Where is value determined?	<p>“...Value determination is exogenous to RBV (occurs external to the firm in the marketplace)...” (Kraaijenbrink et al., 2009, p.3)</p> <p>RBV is unclear on how the value is determined in the firm and how it can be quantified and measured.</p>	A clear understanding of the nature of value and how and where it is created is of high value to practitioners. A succinct definition of value characteristics is of use in the determination of the interdependence of resources within the VRIN/O framework (Section 2.3.6)
What is the source of value?	<p>“...Value flows from resources with specific attributes: they are rare, inimitable, non-substitutable,</p>	RBV does presume that there are direct links between VRIN/O resources with the required attributes

RBV issue	RBV literature/perspective	Relevancy to the study
	<p>etc...” (Kraaijenbrink et al., 2009, p.3).</p> <p>RBV is unclear on the source of value and how it is linked to the resources that confer competitive advantage. Likewise, there is no further elaboration on a quantum of value. There are many unanswered questions – for example, are there different levels of value? Are there different classifications of value?</p>	<p>that are needed for specific value creating opportunities. However, RBV makes no mention of how the attributed need to be managed or developed and to what extent there are relational (Section 2.3.5).</p>
<p>How is value created?</p>	<p>“...The process of transforming resources into value has not been a focal point in RBV...” (Kraaijenbrink et al., 2009, p.3)</p> <p>A critical element of the RBVs on competitive advantage is the development of VRIN/O resources, however, it is not clear how they combine to produce and deliver value.</p>	<p>Creating value, whether, through product features, support or signature process are essential for an SME competing successfully against larger and better-resourced rivals. Hence, an understanding of creating value and capturing value back is critical to understand (at least in general terms) (Section 2.3.4).</p>
<p>When is value identified?</p>	<p>“...The origins of resources (and how they evolve) have received relatively scant attention in the RBV literature...” (Kraaijenbrink et al., 2009, p.3).</p> <p>Building on Kraaijenbrink et al., (2009) the lack of a micro-view in RBV is a major contributor to the lack of understanding of the path that is followed in generating value. There is no evidence in the literature that attempts to measure if value creation is a linear process or does value get created at defined points in time.</p>	<p>The creation of resources is fundamental to the entrepreneurial aspects of strategy development and execution (Section 2.4.3).</p>
<p>What is the degree of resource specification?</p>	<p>“...Specification of resources tends to be broad-grained, rather than fine-grained...” ...” (Kraaijenbrink et al., 2009, p. 3).</p> <p>Most notable is the absence of research in SMEs regarding</p>	<p>How are resources created at the micro-level? To what extent are resources at the micro-level relational with other resources? The extent resources need, or can, have</p>

RBV issue	RBV literature/perspective	Relevancy to the study
	resource configuration and development. A study focusing on resource building in SMEs is, by definition, going to offer more of a micro-view than that of the large organisation.	specifications that make them industry-unique (Section 2.3.11).
To what extent are resource interaction effects pursued?	Often noted, but not a distinctive focus of theoretical or empirical work..." (Kraaijenbrink et al., 2009, p.3). The literature synthesis failed to locate any empirical studies that adopt a fine-grained analysis of the commingling of resources to develop competitive advantage.	The study focuses on SMEs, so there is a necessary requirement for commingling resources that are interdependent (Section 2.3.6).
Is RBV analysis static or dynamic?	"...The analysis represented as dynamic. But, often, theoretical implications are drawn based on the competitive equilibrium—i.e., static predictions..." (Kraaijenbrink et al., 2009, p.3). The debate about the static condition of the RBV has led to the divergent stream of the dynamic capability view. The RBV analysis of competitive advantage can be compared to a snapshot in time, that reports the static position at that point.	The RBV recognises that competitive advantage cannot be permanent but can exist if there exist heterogeneous organisations capable of developing VRIO resources. However, RBV implies that value creating resources are dependent on always satisfying all the four VRIO conditions to remain. This study is concerned with SMEs and boundary spanning activities can ensure that the correct mix of value-added resources remains VRIO compliant (Section 2.3.9).
Marketplace (demand and supply/resource) heterogeneity	"...Marketplace heterogeneities and uncertainties are recognised but have received limited attention in the RBV literature..." (Kraaijenbrink et al., 2009, p.3). The fuzzy boundaries between regeneration and reconfiguration of resources do not receive much attention in the RBV literature. Similarly, the RBV does not differentiate between different industries and makes no allowance for the influence of	The more customer focussed the approach by a firm the more the potential for market niches to be created. RBV does not concern itself with the fact that market conditions can change quickly and that there may be numerous variants of VRIO resources required to maintain competitive advantage (Section 2.5.3).

RBV issue	RBV literature/perspective	Relevancy to the study
	complementary or moderating factors that may appear periodically in periods of market change.	
Knowledge generation and dissemination for VRIN/O resource alignments	There are no mechanisms whereby information flows into the organisation are facilitated in the RBV, even though, it is an internally focussed theory.	The VRIO variant alludes to the importance of the correct organisation of resources. The RBV does not provide any insight into how that should happen (Section 2.4.2).
Organisation learning and knowledge building	“...Intangible resources such as culture, knowledge and competencies can lead to competitive advantages...” (Kraaijenbrink et al., 2009, p.3). The RBV does not consider any resources that may sit outside of the firm that may be intangible in nature.	The VRIO iteration of the original VRIN recognised the needs of the correct orchestration of resources as a condition of competitive advantage. The orchestration of resources needs to consider tangible and intangible and whether they are internal or external to the firm (Section 2.4.3).
Customer as a resource	The customer value construct remains undefined in the RBV. It, nevertheless, is a critical concept in RBV and requires conceptualisation.	The key dimensions of customer value are an example of an important concept that is left without much by way of empirical testing and further theoretical development in the RBV literature (Section 2.5.4-5).

2.7 Summary of Chapter

2.7.1 The Relevancy of the RBV to the Study

There is still a limited understanding of how and why firms become different in their quest to attain a competitive advantage over their rivals. This study aims to contribute to filling this gap in knowledge by combining the RBV and boundary spanning influenced learning as a lens through which to compare the VRIO resources and capabilities across the case-study firms (Rumelt, 1991; Wernerfelt, 2006). The RBV literature has highlighted the critical importance of understanding the relationship between the resources they control and firm performance for managers (Knott, 2015). In recent years, arguably, the dominant theoretical framework underpinning this relationship has been the RBV of the firm (Wernerfelt, 1984; Barney, 1991).

The key element of the RBV Theory has been the recognition of resource heterogeneity and immobility between firms. The attractiveness of the RBV for this study of SMEs lies in its attention to resource heterogeneity and immobility as distinguishing factors of competitive advantage instead of the more fundamental notion of measuring relative strengths and weaknesses. In researching SMEs and competitive advantage against rivals, the concept of value-rarity-imitability-organisation (VRIO) technique from Barney (2002) is more revealing than attempting to establish competitive advantage gain through specific strengths and weaknesses compared of the case-study SME's. Despite the criticisms levelled at the RBV, it has become widely used for assessing the extent to which a firm's resources meet the criteria for sustained competitive advantage.

The limitations of the RBV and VRIO technique has been extensively discussed in the literature review, however, there exists no other 'complete' theory that has come to the fore to replace it. The emergence of the dynamic capability view attempted to address the special conditions of firms who operate in environments of extreme change. Not unlike the RBV, it too has its criticisms. The two main theoretical schools of the construct cannot agree on what a capability is, and how it is credited (Helfat, 2009; Helfat et al., 2007; Katkalo, Pitelis, & Teece, 2010; Teece et al., 1997).

The VRIO technique (Barney, 2002) has established itself as a preferred textbook approach for measuring the extent to which a firm's resources meet the criteria for sustained competitive advantage (Knott, 2015). This involves assessing the resources of the firm under the conditions of strategic value, rarity, the difficulty of imitation, or substitution, and how well they are organised and exploited by the firm. Thus, the literature suggests, VRIO provides a framework for managers to determine what resources are valuable to a firm and what makes them so, how vulnerable they are to imitation, and how the firm can exploit and manage them sustainably (Barney and Hesterly, 2006). However, the operations of SME are not quite so simple as that. In response to the shortcomings of the RBV, additional constructs of the Knowledge-based view KBV (with emphasis on boundary spanning) and Key account management (KAM) and the role of evangelistic customers was also introduced.

2.7.2 The Relevance of KAM and KBV

The literature has shown that effective KAM is an important element of gaining a loyal customer following. Customer centricity is recognised as one way to build strong relationships and to bring the firm closer to its customers. However, this is not alone enough to build competitive advantage since it is something that can be copied by competitors, and hence is not a VRIO resource. As Ryals and Davies (2010) noted, CEOs spend more and more on training and recruitment of specialist sales staff without ever realising the benefits. Thompson (1967) recognises that value rationality through human inputs fundamentally underpins the culture and the co-creation of value inside and outside the firm. It is this notion that leads the research to consider how and what boundary agents can do to

compliment the best efforts of a well management KAM in a firm. In other words, can the alignment of external agents in the form of boundary spanners be an effective compliment to achieving competitive advantage?

To answer this question, which is embedded in RQ1, the literature surrounding boundary agents was reviewed. Allen and Cohen (1969) define the activity of boundary spanning as a process in which firms identify, sense, and accumulate knowledge and information on developments or market intelligence that is outside of their professional expertise. The literature has shown that boundary spanning can be achieved in many different ways, but they all have one element in common: the acquisition of knowledge or expertise that is required by the firm. The literature focusses on larger scale boundary spanning, where teams are involved in transfer of knowledge between a university and firm as an example. The literature gives scant attention to the more micro scale, where the SME works with just a single person: a gap in the literature this study aims to also address.

The use of boundary spanners at the level of the SME is an interesting one because often the arrangements are less formal and can be ad-hoc. In the context of this study, boundary spanners will often be customers who are also brand evangelists and who are passionate about the company, its products and perhaps its culture. Pimentel & Reynolds, (2004) demonstrate that some brands can some brands are able to engender almost religiosity and cult-like states amongst their customers. These brand evangelists are normal people, normal customers, often consider a brand to human properties, and build a relationship with the brand (Fournier, 1998; Sikkel, 2013). There are many examples in the literature of successful brands and products that have achieved tis status (Apple, Harley-Davidson, Golf GTI owners, and so on). Such passionate customers can be often labelled as ‘petrol-heads’, or ‘tekkies’, or ‘geeks’, but they are effective by their positivity through WOM and social media in promoting the brand. Indeed, Aaker (2009) recognises that for a firm to possess such positive brand assets and to have customers who act as passionate evangelists are a primary source of competitive advantage and future earnings. It is precisely this intersection between evangelical customers and boundary spanning which is at the heart of this study and the identification of the value they can deliver.

2.7.3 The Nexus of RBV, KBV and KAM

The empirical studies surrounding RBV, KBV and KAM are focused, in the main on larger organisations. The level of analysis needs to be extended beyond the firm’s boundaries and by extension to explicate the actual development of resource and value creation at the level of the individual in the firm. This research answers that call, but more precisely examine resource development and VRIO value creation in the SME, at the level of the individual worker. Danneels (2002) suggests that extending the level of analysis to the individual worker will help with the understanding of the tensions from learning derived from internal and external sources. This is the

key to the ultimate performance of the firm, according to Alegre et al. (2013). The level of the individual when it comes to contribution to the firm's knowledge base cannot be underestimated in terms of VRIO resource creation in SMEs.

While it is important to assimilate the correctly decoded information into the firm (Winter, 2000), it is also equally important to understand what it is that adds value to the customer and economic gain for the supplier. Achieving such a balance has long been recognised as an essential part of a firm's strategy (Porter, 1985; Slater & Narver, 1998). If the firm can correctly decipher customers' needs, it can formulate a winning strategy of creating value that exceeds the cost of creating it (Desarbo, Jedidi, & Sinha, 2001). The body of literature is in agreement with the necessity of such an insight being a critical contributor to the success of the firm (Landroquez et al., 2011). In the SME, this can be a major challenge. The literature is not clear in its understanding of how different resources and capabilities in the SME evolve and develop into VRIO resources understanding the company's strategically relevant capabilities has its foundations in the collective knowledge of the individuals. The collective know-how fundamentally underpins the VRIO resources and the micro-foundations of the dynamic capabilities of the SME. The central argument is that is the knowledge developed through the specialist assistance of boundary agent is "sticky" and less transportable to be duplicated by rival firms, and hence can lay the foundations of the VRIO resources that eventually lead to competitive advantage. If the VRIO specific knowledge can be retained, a causal ambiguity develops that can also lead to competitive advantage. The underlying mechanisms by which boundary-spanning relationships can build causal ambiguity is also a significant knowledge gap (Ancona & Caldwell, 1990).

The conceptual framework for this study is based around the RBV. The discussion in the foregoing has concluded that the RBV is tautological. With that in mind, a more explicit interpretation is needed if the RBV can legitimately be used in this study. One option is to consider the RBV as a heuristic model for managers, rather than as a theory. In other words, to consider the RBV as a definition and illumination of strategic competitive advantage and its sources. In this case, the message derived from the RBV is that firms should strive to differentiate themselves by developing and obtaining resources to which no other firm has access – and at a cost less than the resulting increase in price or decrease in costs. To the experienced manager or entrepreneur, this hardly a eureka moment, as Wernerfelt (1995, p.173) comments that "...this is so obvious that I suspect that we soon will drop the compulsion to note that an argument is 'resource-based...'"

Thus to use the RBV theory in the study of competitive advantage in the case study SMEs, a method to decouple the tautological definitions of 'value' is required. To do this, the definition of 'value' requires that the value of a firm's resources and capabilities must be independently determined from

the value of products/services delivered to the firm's customers. The inference then is to determine independent appraisals between a value that is developed endogenously and exogenously.

The overarching conclusion from the literature review on the RBV suggests that there are practical difficulties in translating RBV theory into application guidelines and in linking analysis and action. The reason is that it is not always clear to managers to ascertain how much to invest in specific resource characteristics to maintain a competitive advantage (Kraaijenbrink et al., 2010). A similar conclusion was drawn from Arend and Lévesque (2010), who concluded that it is problematic for managers to identify the relevant resources that satisfy VRIO criteria. This aligns with previous literature "...pointing out that many of the least imitable resources, such as competence embedded in the firm, are hard to identify effectively, and once identified are inherently hard to manipulate..." (Knott, 2015, p. 1806).

In order to address the three issues just described, the study was designed to address these significant gaps by employing the following research design:

- A pragmatic approach with an emphasis on the qualitative nature of the study;
- A minor quantitative pilot study to seek an overview of customers' opinions of the value-creating VRIO resources and capabilities considered necessary for consideration to purchase the technology in their classrooms;
- Semi-structured interviews with SMEs to compare and contrast VRIO resources across different countries and their relationship to competitive advantage; and
- An explicit focus on the individual as a source of VRIO resource generation in the case-study SMEs;
- A specific focus on boundary agents as purveyors of critical knowledge that can be transposed into critical foundations of VRIO resources at the nexus of KM, KAM and the RBV.

The findings from the literature are that it is sparse in its treatment of the SME concerning VRIO resource and dynamic capability building at the micro-level. Thus, the three RQs have been formulated to cast some new light in this area to contribute to filling this gap. The literature highlighted the development of knowledge from outside of the organisation as a potential source of VRIO resource and dynamic capability building. An effective way through which knowledge can transfer is through boundary-spanning activities.

Accordingly, using the utility of boundary-spanning activities, Chapter 3, presents a conceptual model that illustrates the three main themes of the literature (RBV, KM and KAM/Boundary Spanning) that aggregates around the development of VRIO resources and the 'functions' they serve in the organisation. These three research streams are essential foundations for this study of

how VRIO resources and, in some cases, how dynamic capabilities are developed and reconfigured. The conceptual model will be used to guide and test the hypotheses formulated from the conclusions drawn from the literature. Figure 2.4 following shows the integration of the literature streams and how they integrate.

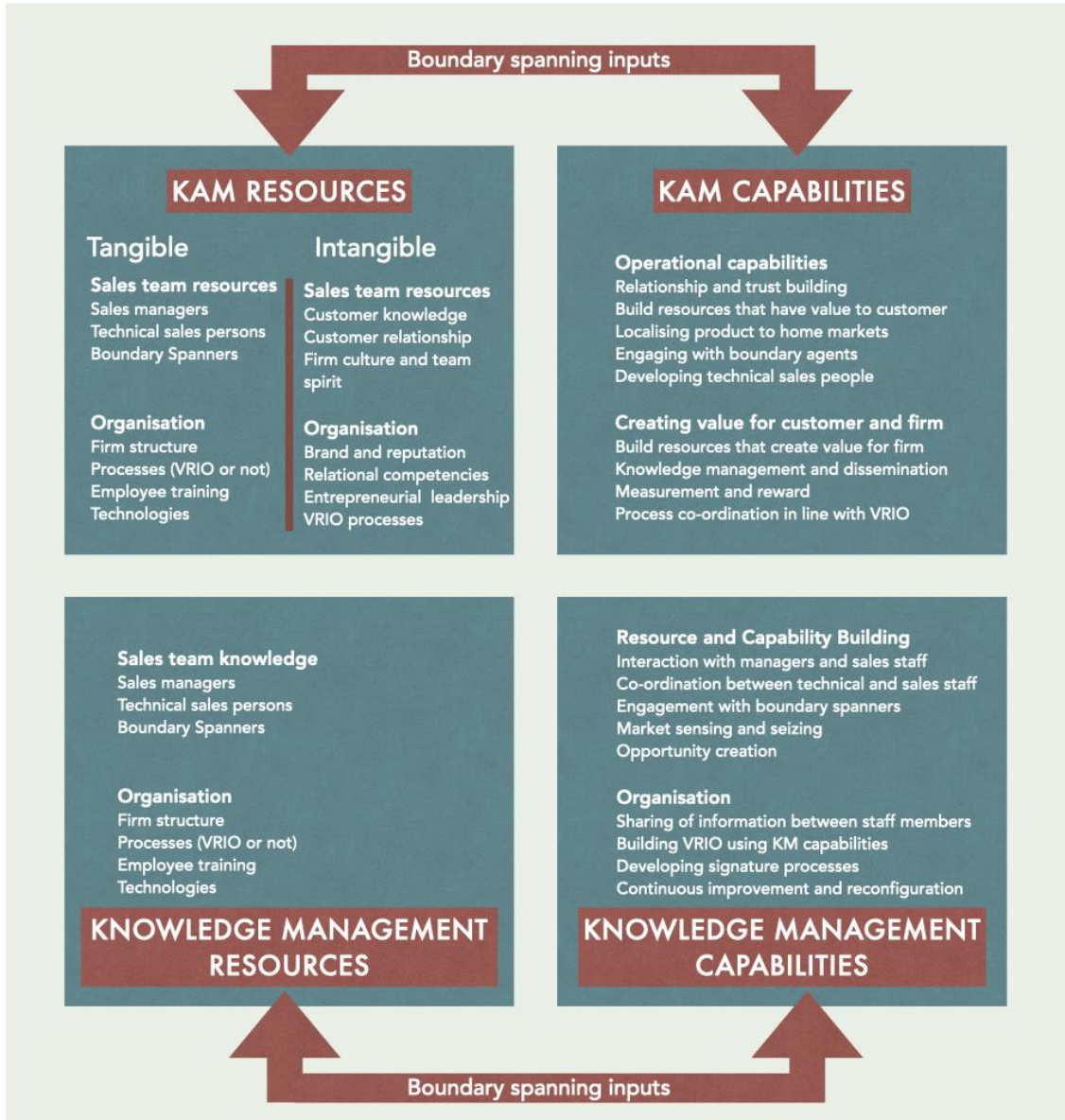


Figure 2-4 – The literature streams deployed in the study.

3 Conceptual Model

3.1 Introduction

The multiple-case study is about SMEs who import a range of specialist science educational equipment, known as data-loggers. Although empirical studies have consistently demonstrated that data-loggers have positive effects on students learning science, the resistance to the wide-scale adoption by educators in the classroom continues to present challenges for the case-study firms (Birch & Burnett, 2009). A consistent explanation has been the lack of confidence in using the technology by educators (Davies et al., 2012). Since there continues to be ambiguity in this area of scholarship, the need for resellers to understand the barriers that must be overcome presents a strong rationale for this study.

The starting point will be a short pilot study with a cohort of the customer, randomly selected to determine what value-added services would be influential in considering purchasing the data-logging technology. The initial pilot study will be used as a guide to ensure that the main qualitative study that follows can be as comprehensive as possible. The pilot phase will, therefore, act purely as a situational guide to help explore in detail the second, more detailed qualitative step. The central qualitative part of the research will focus on the case-study SMEs themselves.

3.2 Formulation and Rationale for the Conceptual Model

The chapter builds a conceptual model from the findings of the literature that will look to develop a mechanism to guide the study to address the three research questions (RQs).

In determining the factors that build the VRIO resources that lead to competitive advantage, the RBV theory has been adopted for reasons outlined in the preceding discussion. The RBV, despite its critiques, is regarded as the textbook model for evaluating the sources of sustained competitive advantage in firms. The question for a VRIO researcher is how to assess and identify the merits of the selected attributes from which competitive advantage is derived.

The RBV theory is of particular relevance in the small business context, as it contends that long-term survival is dependent upon the firm's unique offerings. The development of this uniqueness over time is by nurturing the organisation's core competencies. Figure 3.1 following, elaborates the conceptual model that will guide the remaining stages of the study. The literature review concluded that **customer orientation** is a critical factor in attaining and sustaining competitive advantage (Galbraith, 2011, 2014). The RBV is clear as to the importance of rent creation from value-laden resources that are valuable to the customers and that bring value back to the firm (Barney, 1991; Barney & Clark, 2007; Priem, 2007; Priem & Butler, 2001a; Wernerfelt, 1984a, 1995). The figure

starts with the case study SMEs customer orientation mediated through the agency of boundary spanning. In a study of SMEs, Dooley (2017) showed that innovation was not enough to achieve success, but a creative adaptation and understanding of the customer was the most crucial criterion. Based on the conclusions from Dooley's (2017) study, the first component of the conceptual model will be the firm's deliberate focus on **customer orientation** through the agency of boundary spanner partnerships.

The firm is also subjected to **internal factors** such as lack of resources (in SMEs), such as human or financial capital, and technology resources. It is widely accepted that SMEs are often faced with a lack of resources, and this forces them to operate under severe financial and expertise constraints. Moreover, inadequate resources issue can often influence these firms to focus on short-term rather than long-term goals (Dooley, 2017; Majocchi, Bacchiocchi, & Mayrhofer, 2005). The lack of financial resources inhibits SMEs from further development and exploitation of opportunities existing in the environment. Hence, the RBV perspective comes in handy as it offers an opportunity to analyse the small business success that is associated with internal resources and capabilities. SMEs often turn to external assistance in the form of strategic alliances or through some sort of boundary spanning (Van de Ven & Johnson, 2006). Allen and Cohen (1969) define boundary spanning as a process in which actors identify, sense and accumulate knowledge and information on developments or market intelligence that is outside of their professional expertise.

As discussed in Section 2.3.7, the literature in strategic management regards the customer as being part of the external environment (for example, Ansoff, 1957; Porter, 1996; Shapiro, 1989), while others acknowledge that customers are key stakeholders in the firm (Donaldson & Preston, 1995). Thus, the RBV allows for a flexible perspective to SME success that is associated with internal resources as well as external stakeholders and capabilities procured across boundaries. The conceptual model also acknowledges that there are **external factors** that can exert forces over the SME over which it can have no control (Porter, 1980).

The locus of the conceptual model is to examine involving boundary-spanning activities to obtain superior knowledge from customers, and the market can be leveraged through the timely deployment of key account management and can build the all-important VRIO resources. The boundary-spanning is also closely associated with a particular characteristic of boundary spanning – that of the **evangelic customers (committed buyers)** who are passionate followers of particular brands (Section 2.3.8). The conceptual model included this group (which are also the same petrol-heads or geeks of the automotive or computer industries) because it adds novelty to the research and is also an area that remains untouched in the literature.

Changes in combinations of product and service attributes, as well as related benefits and services that customers desire, have been referred to as customer desired value change (Flint et al., 2011). However, this can be a dynamic situation in some industries more than others. The literature tells us that those firms that best meet customers' current desires usually have more satisfied and loyal customers (Morrison & Schmid, 1994). Empirical evidence shows that various measures of customer value are positively correlated with satisfaction and loyalty behaviour (Lam, Shankar, Erramilli, & Murthy, 2004). In this stream is the notion of signature processes that appears in the strategic management literature in various guises in relation to their role in underpinning VRIO resources and in creation of dynamic capabilities. Signature processes are often reflective of the firm's values and often attract customers because of that. Teece (2014) comments that signature processes crafted through creativity, experience and firm's historical reputation can make it hard for rivals to imitate and hence can be a source of VRIO resource creation.

Galbraith (2011) posits that the firm which focuses closely on the needs of the customer is making a sensible strategic decision in the long run. The requirements of customers are generally changing as most technical-biased B2B markets are developing towards a preference for solutions or systems instead of stand-alone products (Galbraith, 2011). A better 'information asymmetry' exists when knowledgeable boundary spanner between the sales manager and the customer, according to Frenzen, Hansen, Krafft, Mantrala, and Schmidt (2010). The literature is entirely consistent in concluding that amongst the most successful approaches in building trust and long term relationship with customers is the move from salespeople to boundary-spanning, cross-functional teams (Rangarajan et al., 2004). The seminal article in the HBR from L. J. Ryals and Davies (2010) found that 'consultants' salespeople can quickly build a rapport with customers, exhibit effective problem-solving sales behaviours and are good at listening to customers and developing a solution that meets their needs. Interestingly, they secure a big contract against the odds. It is, therefore, propositioned that the use of specialist salespeople working in conjunction with, or under the guidance of, boundary spanners, facilitates the transfer of critical knowledge that is used to build VRIO resources, which if correctly configured, leads to competitive advantage.

Accordingly, the conceptual model combines the use of boundary spanning with internal key account management resources as a dual effect on the creation of the all-important VRIO resources. The combination of knowledgeable boundary agents to help create value for the customer and the developed resource bundles in the SME to capture that value is propositioned to be a source of competitive advantage. The direction of the arrows in the model refers to a positive effect in that direction (Figure 3.1).

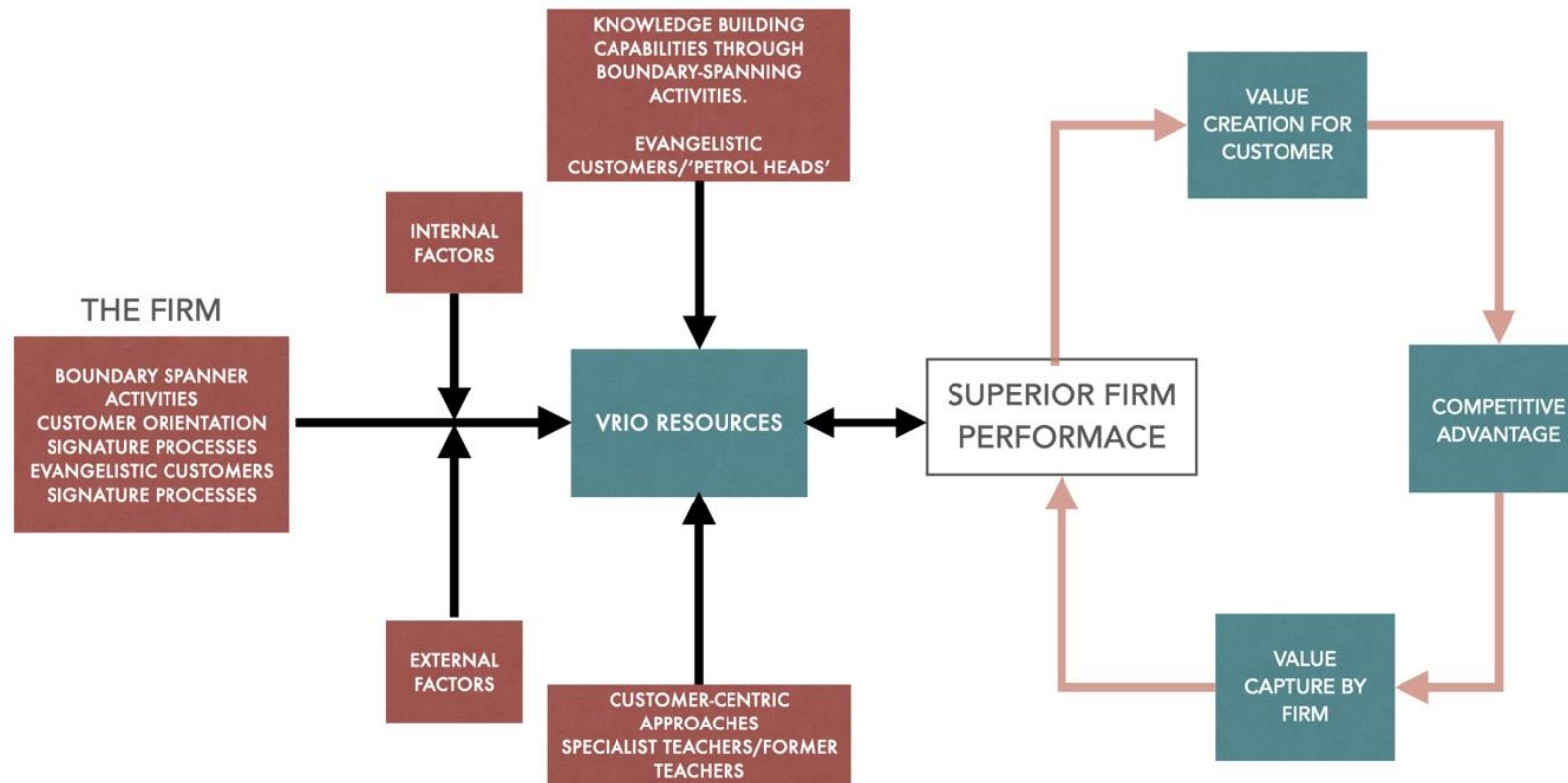


Figure 3-1 – The conceptual model (Author’s elaboration)

3.3 Pilot Study – Quantitative (Customer Focus)

The research is primarily a qualitatively based study. However, a small pilot study was introduced to gain an understanding of how a customer perceives value and, perhaps, elucidate any links with VRIO creation by the supplier. Hence, for this reason, the study is considered as being pragmatic, but with a heavy interpretivist leaning.

The objective of the pilot phase of the research study is to explore the bundles of resources in the supplier (firm) that are the most valuable to the customer. The suitability of a quantitative approach is based on the scale and scope of the participants. The population sample of over 40,000 customers spread across several regions is only accessible via an online quantitative instrument. The psychometric scale to be deployed is based on a robust Technology Assessment Model (TAM).

In an extensive meta-analysis study conducted by Dwivedi et al., (2011) of 43 different empirical studies it was demonstrated that the TAM scored consistently well in content, construct and predictive (concurrent) validities. The findings showed that the Chronbach's (α) returned a value of greater than or equal to 0.8 to all constructs measured by the TAM scale. The high-reliability measures were shown to be in line with similar meta-analysis findings for the same and underlying TAM scale as measured by other researchers (e.g. King & He, 2006) -sales training influences can influence the confidence of customers to invest in the equipment.

The key contribution of the boundary agent to teachers in this field is that teachers are much more likely to use the technology if they believe the equipment improves their job performance (Davis, Bagozzi, & Warshaw, 1989). In a study conducted by Moses et al. (2013), perceived usefulness exerted a direct effect on teachers' attitude to using technology in their classroom if they believed it would improve their practice. These observations are also supported by Teo et al. (2008) and Davis et al. (1989) who also recognise the critical nature of teachers' attitudes affecting the integration of technology in teaching and learning.

The main phase is the qualitative that seeks to build on the findings of the pilot study and gather more abundant data through semi-structured interviews with the case-study SMEs.

3.4 Main Research – Qualitative (Supplier Focus)

The qualitative study sets out to answer three key research questions, which are now discussed in turn.

3.4.1 RQ1 How does knowledge integration through customer orientation and boundary spanning influence VRIO resource configurations?

The review of the literature concludes that there is strong evidence in favour of a customer-centric approach supporting the development of a customer relationship strategy (Best, 2009; Day & Day,

1990; Morrish, Miles, & Deacon, 2010; Treacy & Wiersema, 1993). In his study, Ciulu (2010) also demonstrated that strategic communication activities by salespersons encourage individual selling performance and can lead to an increase in company value. Davies et al. (2010) recognise the importance of knowledge transfer from the specialist salesperson and the linkages between relationship management and sales management.

3.4.2 RQ2 - How do knowledge generation and KAM managerial actions contribute to the attainment of competitive advantage through the development of VRIO resources?

The literature review acknowledges that new knowledge plays a crucial role in organisational transformation in terms of competitiveness (Henderson & Cockburn, 1994; Laaksonen & Peltoniemi, 2016; Zahra & George, 2002). The body of scholarship also suggests that firms differ significantly in their ability to learn from their experience and improve their performance (Alegre et al., 2013). The importance of combining new and existing knowledge in firms is also widely recognised in the literature (For example, Chang, 2003; De Clercq & Arenius, 2006; Ettlie & Pavlou, 2006; Nonaka, 1994; Nonaka et al., 2016; Nonaka & Takeuchi, 1995; Winter, 2000). The role of external influences, such as boundary agents, is also recognised by Nonaka (1994) and suggests that knowledge acquired by boundary agents is often tacit. In addressing this issue, Allen (1977) stresses the importance of individuals who are involved in boundary-spanning activities in their role as collectors, brokers or diffusers of knowledge to the firm. The complexity of the knowledge needed to cross the boundary between the firm and its environment is a curvilinear relationship between the novelty value of the knowledge and the boundary complexity (Tell, 2017; Van de Ven & Zahra, 2016). However, there is a lack of empirical research in the area of SMEs regarding knowledge integration and VRIO development for competitive advantage.

3.4.3 RQ3: Where is the value created and captured by the firm?

Intertwined with the assimilation of important knowledge through boundary spanning and KAM is the concept of customer value. The concept has been widely used in the literature but, at the same time, not at all clearly defined (Du et al., 2006; Lam et al., 2004; Naumann, 1995; Payne & Frow, 2005; Prahalad & Ramaswamy, 2004; Treacy & Wiersema, 1993; Woodruff, 1997). Naumann (1995) suggests that customer value depends on a triad of product quality, service quality and value-based prices. The balance between quality, cost and delivery times is argued by Pine (1993). Marketing managers understand the requirement of what they understand what their customers' value to survive and grow in competitive markets (Flint et al., 2011). With these conclusions in mind from the literature review, the second research question focuses on the role of boundary agents at the nexus of customer added value and the creation of the necessary resources to co-create value for the customer and the firm.

As discussed in Section 2.3.6, the RBV theory does not attempt to contextualise customer value. This leaves an important gap in the literature. In determining the important customer value attributes of functional, benefits, attitudes and networks, an opportunity exists for the SME manager to understand how and what resources should be reconfigured with the VRIO characteristics. The facilitation of a networking structure by the firm for its customers is also highlighted by Quinn (1992) as a powerful value creation attribute. RQ3 was constructed, therefore, such that a holistic evaluation of customer value can be investigated thoroughly through the lens of the RBV and the necessary VRIO resources identified that lead to competitive advantage in SMEs.

3.5 Conclusion

The next chapter will discuss the research methodologies employed in the case-study approach using a pragmatic epistemology. It starts by discussing the different paradigms for the research methodology employed and continues toward developing a research design for the study using a pragmatic philosophy to collect data and operate the conceptual research model in Figure 3.1 (above). The chapter will also briefly summarise the statistical tests used in a quantitative pilot using SPSS v21 and the main research qualitative phase using the Template Analysis procedure with the aid of NVivo 10.

4 Methodology

4.1 Introduction

This study concerned SMEs acting as distributors of an educational product across different regions in Europe as part of a multiple case study. The research is guided by three research questions to determine how and by what methods the important VRIO resources are created that create and capture value and ultimately lead to competitive advantage.

As outlined in Chapter 2, the RBV's VRIO framework has established itself as an essential conceptual framework for the study of organisations and competitive advantage. However, there are limitations of the framework, as discussed in Section 2.3.21. It is deficient in unpacking the 'black-box' of the VRIO resources; it is vague on what constitutes value and lacks a coherent definition of resources. Moreover, RBV lacks empirical focus on SMEs (Abell et al., 2008; Felin, Foss, Heimeriks, & Madsen, 2012; Felin & Hesterly, 2007).

The study was conducted mainly as a qualitative study with a short quantitative pilot phase for the reasons outlined above. The practical reasons are discussed later, but the predominantly qualitative methodology was chosen as the most suitable approach. Thus, the researcher preferred not to choose between one philosophical position and another. Instead, the researcher's view was that the consideration of the most suitable method to answer the RQs was the most important determinant. His experience influenced the researcher's philosophical and methodological approach in senior management since 1990 and the desire to examine the formations of VRIO resources and the foundations of dynamic capabilities in the context of SMEs. Accordingly, the stance of the researcher is that of pragmatism. A discussion of the possible conflict of insider research is present at the end of this chapter by way of a full and frank reflection of the research process.

This study attempts to fill those gaps discussed in section 2.7 and contribute to the body of knowledge as to how resources that satisfy the VRIO requirements are developed in SMEs, and what role the boundary agent can play in that process. The study adds novelty to the field in that it employs a pragmatic approach to gather data sequentially first from the perspective and then from the customer's and then from the case-study SMEs as suppliers of products. The main qualitative component of the research provides the focus of the findings and conclusion. The data offers a unique opportunity to compare perceptions of important customer added value from both sides of the

customer-supplier transactional divide. In advancing the research methodology and the approach adopted, the chapter will first explore the philosophical foundations underpinning the study.

4.2 Philosophical Foundation of the Study

The philosophy of research is often explained in terms of ontology and epistemology. Ontology is concerned with the social reality and nature of the phenomena the researcher wishes to research (Mason, 2006). There is still confusion in the literature about the nature and composition of dynamic capabilities, not to mention different and overlapping definitions. It is, perhaps, not surprising that the ontological and epistemological challenges to research into organisations are given little attention in RBV Theory literature (Fallon-Byrne & Harney, 2017). It is expected that an ontological approach that is focused on SMEs at a level of the individual worker level will better facilitate observation of the import VRIO resources development at its most basic level.

The predominant approach in strategic management research employed is one of positivism, where quantitative analysis forms the bedrock of empirical research. The researcher believes that the SME does not always consciously decide on the course of actions that build VRIO resources and core competencies. The literature tells us that managers of SMEs may also have different ontological approaches to how they explain or conceptualise the reasons why their firms create value-added processes and products for their customers. With this in mind, an approach was adopted that captured the views of both the SME and their customers to gain a deeper grained appreciation of is of value. The quantitative pilot is a minor part of the study; nevertheless, an extensive database was used. Due to the size of the customer base, the most suitable method was deemed to be an online quantitative questionnaire to collect data. The central part of the research was a qualitative approach comprising of semi-structured interviews as part of the multiple-case-study of SMEs provided was deemed most suitable. The pilot study, therefore, serves to act as a guide to unearth and explicate any unexpected factors pertaining to value creation from the point of view of the customer.

4.2.1 The Pragmatic Perspective

The view adopted by the study was that the consideration of the most suitable method to use was more important than choosing between one philosophical position and another. According, the stance of the researcher is that of pragmatism using a predominantly qualitative approach. The philosophy of pragmatism is suited to the research questions that sought to determine ‘how’ important VRIO resources are developed. Also, the study integrates *how* boundary agents and managers also contribute to building VRIO resources and capabilities and, *how* that contributes towards competitive advantage. Since the development of resources is also essentially the study of human issues and agency, ontological and epistemological challenges must also be considered. Gaining the necessary

rich insights into the embedded individual competencies within the organisation is arguably challenging using purely positivist assumptions. The purely positivist stance would not be suitable with its rigidity of approach to seeking deeper knowledge and understanding of value creation for customers and assimilation back into the firm, knowledge gathering, boundary agents' relationship building and managerial resource configurations that lead to competitive advantage. The objectivity presumes that the world is external to the researcher and is easily measurable by scientific methods. If VRIO resource and value creation cannot be easily defined and observable, a purely positivist approach will not generate the insights and understandings necessary for the study.

In this research, the researcher sought an external reality to that of the company's managers and workers and how they perceived their realities in the main qualitative research. For this, a qualitative approach was the most desirable to search for a deeper meaning to the development of VRIO resources that lead to competitive advantage. Eisenhardt (1989) notes that combining both quantitative and qualitative methods in the same study have two key benefits for the research: (i) certainty regarding the validity of the findings is increased, and (ii) an increase in the creative potential as the research continues. Using a predominantly qualitative in the same study steers the researcher to that of a pragmatist who views the research question as being more important than issues of epistemology and ontology. The researcher takes the advice of Tashakkori & Teddlie (1998) that a philosophy adopted should be of a continuum of positions rather than that of opposing positions:

"... at some point, the knower and the known must be interactive, while at others, one may more easily stand apart from what one is studying..." (p. 26).

The ontological position of the researcher is thus pragmatic, allowing both an objective and a subjective worldview of a reality independent of social actors involved in the study. The pragmatic approach allows for an initial pilot study quantitative approach to access the viewpoint of the customer as to what factors are critical to them purchasing products instead of from rivals. By using a questionnaire instrument, the customer responses can be measured in a highly structured, objective way. In adopting a quantitative approach for the pilot phase, the researcher is making the epistemological assumption that credible data can be observed phenomena that can be measured by statistical means through deduction and verification.

4.2.2 The ontological and epistemological argument for the research

There has been much debate surrounding the respective merits of two different epistemological approaches to how research should be conducted: positivism and social constructionism (or

constructivism used by Guba and Lincoln, 1989). Within the field of management research, objectivism and subjectivism are regarded as the two main approaches (Bryman, 2012).

Ontologically, the researcher views the study as being composed primarily of multiple socially constructed realities. The researcher's paradigmatic commitments in this study were influenced by the search for a common ontological reality amongst the managers of case-study SMEs and the kind of knowledge that was obtainable from them. From an epistemological point of view, the researcher had to consider how sure that the knowledge obtained was "true" in the sense that the managers believed it to be so. These ontological and epistemological considerations influenced the methodological concerns about how to acquire the knowledge of what constitutes the configuration or re-configuration of the resources by the managers of the SMEs. Taber (2013) recommends that the researcher should think deeply about the ontological and epistemological issues relating to the research because the beliefs of the researcher himself will influence the research decisions as well. The debate, however, between ontology and epistemology is unavoidable, according to Saunders et al. (2009). It has been suggested by Guba & Lincoln (1994) that questions of method are secondary to questions of epistemology and ontology thereby inferring that choosing between one position and another is unrealistic in business research (Saunders, Lewis, & Thornhill, 2009). The researcher brought prior knowledge of the industry to the research study and so was aware of the ontological conflicts that were possible between all of the actors, including the researcher himself. In selecting a multiple case study of SMEs from diverse cultures, any commonalities between ontological positions of actors provide a means to derive some certainty in the conclusions. Bryman & Bell, (2011b) refer to ontological concerns with issues of causality, reliability, validity, replication, and generalisability. The researcher was cognisant that a multiple-case study conducted on a niche market using a qualitative approach would be open to charges of ontological limitations as just stated.

"...Epistemology concerns what constitutes adequate knowledge in a field of study..." according to Saunders et al. (2009, p. 112). In other words, it is about inquiring into the nature of the physical and social worlds (Easterby-Smith et al., 2012). Based on the nature of resource building in SMEs, a focus at the level of the individual worker was unavoidable. Interactions and intimate relationship between researcher and key workers in the SMEs during the research were also unavoidable; a full and frank reflective discussion is added at the end of this chapter. This was due to the epistemic nature of the managers' practical knowledge, beliefs, and motivations, declarative and procedural knowledge. In practical terms, the epistemic expertise of the managers in the case-study SMEs was studied from the perspective of how knowledge is obtained and used to determine the nature of customer value and the corresponding VRIO resources that underpin the quest for competitive advantage. The qualitative aspect of the study acts as the locus for the evaluation and discussion of the research findings. Section 4.3 now discusses the research design, research sequence, methods, and justification of use.

4.3 Research Design

The research design followed directly on from the literature review when the researcher was in a position to address precisely the specific area of research interest. The formulation of the exact research questions followed a sequential path as described below:

- Decide on the area of interest.
- Conduct a literature review.
- Conduct Pilot Study.
- Analyse Findings.
- Plan research process.
- Decide on specific research questions.
- Select research methods to be employed (pilot and main research study).
- Decide on ontological and epistemological approach.
- Select data measuring tools for an exploratory pilot study.
- Analyse data.
- Select data measuring instruments for phase main research study.
- Design interview protocol.
- Negotiate Access.
- Select case-study companies and interviewees.
- Collect & analyse data.

4.3.1 Research Plan and Approach

The literature review showed inadequacies in answering the specific research issues that were of interest to the researcher. Accordingly, the study adopted an exploratory approach. The research process followed a sequential explanatory strategy, as recommended by Creswell et al. (2003). This method is characterised by “... the collection and analysis of quantitative data followed by the collection and analysis of qualitative data...” (Creswell, 2009, p. 215). The steps are illustrated in Figure 4.1 following.

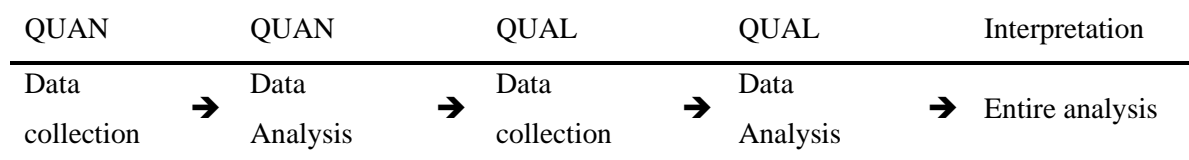


Figure 4-1 - Sequential explanatory design (Creswell, 2009, p. 213)

The initial quantitative sequence involved an exploratory pilot phase of the data gathering. This phase focused on a large sample population of customers (science teachers) to determine how they perceived value as a customer. The research sequence then moved to the central part of the research, the qualitative phase. Here semi-structured interviews were carried out with suppliers (the case-study SMEs). Such an approach can be especially useful when unexpected results arise from the quantitative pilot and thus prompts the researcher to delve more in-depth at the main qualitative phase (Morse, 1991). The main strength of this sequential approach lies in its simple design where each step fell into clear and separate stages, making it easier to report (Creswell, 2009).

4.3.2 Research Sequence

Together the conceptual frameworks proposed by Teece et al. (1997) and a questionnaire based on the technology acceptance model (TAM) was prepared for the large-scale distribution of the database of 41,856 named science teachers. The applicability of the questions within the framework was initially discussed with a small group of full-time teachers to verify that the questions were relevant and easy to comprehend. The pilot quantitative data received from the online questionnaire instrument was analysed and helped to supplement the RBV literature in the qualitative semi-structured interviews. Figure 4.2 summarises the sequence of the phases and eventual triangulation of the data. The central part of the research study continued focussing on the three RQs and evaluated against the conceptual model Figure 3.1 above.

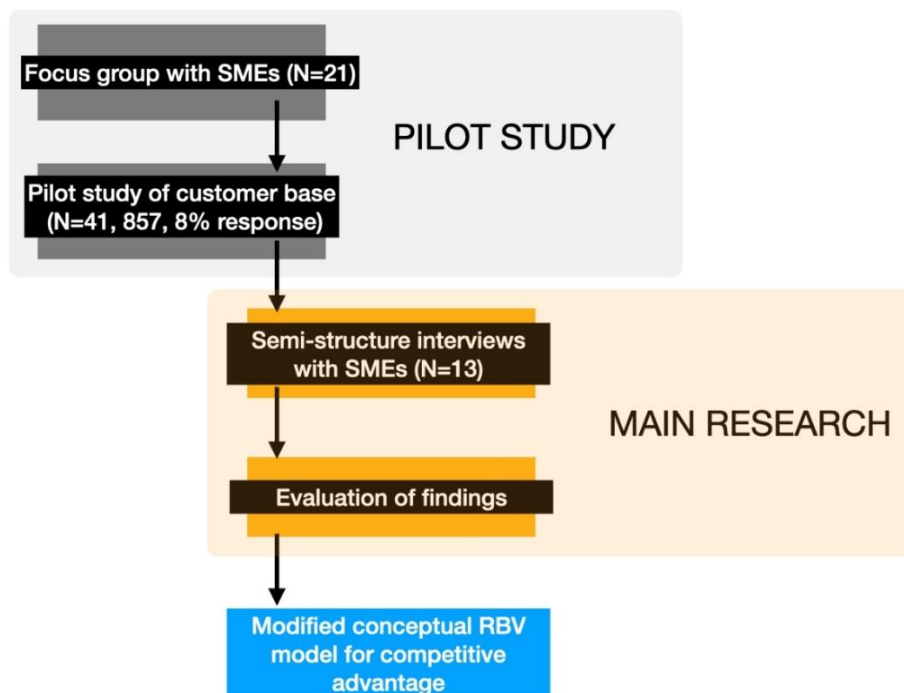


Figure 4-2 – Sequence of data collection processes.

4.3.3 Research Methods Selection & Justification

The review of the empirical research in RBV theory found that quantitative studies are predominant. (Ambrosini & Bowman, 2009). Factual, objective secondary sources of data have been the prime source for analysis. The dominant approach has been to review company performance data and to then match against the record of profits, patent registrations and other such metrics. The quantitative studies tended to be either conceptual ideas or studies derived from quantitative secondary data (Ambrosini & Bowman, 2009). The appropriateness of a qualitative approach is recognised by Ambrosini & Bowman (2009, p. 13), who notes that, with its typically smaller sample sizes, it is: “...likely to be more appropriate for understanding the subtlety of resource creation and regeneration processes...” Where the existing theory remained underdeveloped, such as RBV theory in SME, Eisenhardt (1989) makes the case that a comparative qualitative case-study research is a viable option.

The positivist view is to gather data without contaminating it in any way, thus ensuring that only objective facts are collected. As discussed previously, this may be fine for the natural object, but people are not natural objects and can be sensitive to the inquiry methods used to gather data (Thomas, 2006). People, unlike objects of the natural world, have ideas and opinions about their environment. They are conscious and purposive actors, who may be unpredictable, but attach meaning to what is going on around them (Robson, 2011). In particular, “...their behaviour depends critically on their meanings...” of their environment (Robson, 2011, p. 16). Since the essence of this research is about people, both as customers and those who act as boundary agents for knowledge transfer into the firm, a qualitative element as part of a case-study approach was employed. Scholarship in the rapidly developing construct of RBV and dynamic capability theories has focused on theoretical contributions or empirical research based on either quantitative or qualitative methods. The conclusions from these studies fail to get to the heart of how and why VRIO resources and capabilities are developed. No empirical research has looked at how a customer might view VRIO resources and customer value generation in a firm and compares how the company views and creates them.

Researchers can gain valuable insights into the nature of VRIO resources and value creation that otherwise would remain uncaptured if mixing of methods is not employed (Barreto, 2010). As an example, a recent empirical study undertaken by Tallot and Hilliard (2016) applied a qualitative longitudinal case-study approach to an SME. The purpose was to understand how firm-specific resources could be used to create new capabilities to sense opportunities in new markets. Their fine-grained investigation illustrated the crucial role played by key managers in the firm in the creation of resources leading to competitive advantage. A similar, but larger-scale qualitative clinical case

study on Samsung by Song, Lee & Khanna (2016) showed how the firm optimised its internal co-competition processes to embrace new business opportunities in the smartphone industry over ten years by creating and renewing resources and capabilities.

There is now an increased recognition in management research that taking a case-study approach with the researcher as the focal point of the research rather than the methods is a practical approach (Morgan & Smircich, 1980). The purists believe that a case-study design is based on conflicting paradigms, whereby choosing a method the researcher is committing to a long-term epistemological and ontological positions that can be difficult to change (Firestone, 1987). Others have expressed an alternative view, in that the "...connection between method-type and paradigm is more aesthetic than logical..." (Firestone, 1987, p. 4). Thus, the view of the pragmatist is that qualitative and quantitative methods are "...rhetorical devices..." (p.4), and should be used together in proportion to what is the most sensible for the study.

Barreto (2010) recommends that further studies should include not only the firm's managers but also any third parties involved with the firm. In so doing, mitigation against potential bias is reduced in the responses of the case-study firms. In adopting a similar design, the opportunity to first collect data from a large customer base rapidly through an online questionnaire was a logical start since it offered some insight into the concept of value creation from the customer viewpoint. The primary research consisting of in-depth, semi-structured interviews with the firms added the necessary conceptual depth. Accordingly, a case-study approach focussed mainly on a qualitative approach with some extra insight from a small quantitative study was therefore deemed to be the most suitable approach for this study.

4.3.4 Multiple case-study Approach

The multiple and single case-study approaches are gaining traction and are becoming advocated within business and management research (Saunders et al., 2009) because it supports "...extensive interaction with people" (Remenyi et al., 1998, p. 44). It has also been argued by Bechara & Ven (2011) that for organisational research, a case-study approach is highly appropriate and provides a better understanding of the 'what' it is that is being studied. There have been calls for more case-study research in the domain of dynamic capabilities by Wang & Ahmed (2007) and Teece (2007).

Creswell (2009) suggests that the criteria for choosing a case-study approach should be carefully considered in terms of (i) implementation sequence of data collection; (ii) priority given to data collection and analysis; (iii) when the findings will be integrated; and (iv) overall theoretical perspective used in the study. Figure 4.3 summarises the decision choices used in this study, showing that the greater emphasis is accorded to the qualitative data.

Implementation	Priority	Integration of findings	Theoretical Perspective Used
Sequential – Quantitative first	Qualitative	At the discussion phase	RBV Framework (Barney, 1991)

Figure 4-3 – The decisions underpinning strategy for inquiry (Creswell, 2009, p. 211).

This research study was influenced and guided by the perceptions of the managers and boundary agents to operate between the boundaries between the firm and the end-user customer. The research was concerned with finding out what happens in this sociological space and how the boundary agents and their corresponding technical salespeople can gather and codify valuable knowledge that leads to VRIO resource creation. The nature of this knowledge was central to the research, and the case-study methodology emerged as the only way to synthesis data so that a more real meaning could evolve as to the VRIO resource configurations, value creation and capture, and reconfiguration by the firm.

In summary, using the case-study approach allows the researcher to utilise the benefits of each approach to overcome deficiencies in the other to maintain a higher degree of reliability and validity (Blaikie, 2007). The lack of case-study empirical study in the larger organisation is understandable, given the challenges of researching busy senior executive in large organisations is highlighted by Boyd et al. (2013). Thus, qualitative designs are less frequently used in strategic management studies, except for specialist aspects of management (Bruni & Verona, 2009; Newey & Zahra, 2009; Rindova & Kotha, 2001). Qualitative methodologies in “...situations, where constructs and linkages are poorly understood...” in the form of case studies, can be beneficial (Barr, 2006, p. 181). In particular, a hybrid case-study approach combining t qualitative and quantitative studies in a single or multiple case-study can be especially relevant to the study of RBV Theory (Barr, 2006). While designs can be more challenging in case-study research (Boyd et al., 2013), the design is gaining more prominence and have been shown to be “...substantially more influential than corresponding mono-method papers...” in strategic management research (Aguinis & Edwards, 2014; Aguinis, Pierce, Bosco, & Muslin, 2009; Boyd et al., 2013; Molina-Azorin, 2012). The researcher agrees with this view, and so the predominantly qualitative data collection was used. Section 4.4 describes the quantitative exploratory pilot study briefly before proceeding to the central focus of the study in Section 4.5.

4.4 Pilot Study – Methods of Data Collection

The design of the survey instrument was developed strictly around the standard questions used in a TAM questionnaire relating to technology acceptance amongst users except for the word “data-logging” was substituted for the more generic term “technology” to add focus and clarity to the purpose of the research. A great deal of consideration went into planning how the TAM framework could be used to maintain its recognised robustness and to achieve a good fit with the requirements of the three main RQs in the qualitative body of the study.

The protocol consisted of 28 questions based on the standard 5-pt Likert scale (1 = strongly agree, 5 = strongly disagree). TAM has proved to be a reliable and robust tool as a measure and predictor of technology acceptance by potential and current users. It has been tested in many empirical types of research, and the tools used with the model have proven to be of quality and to yield statistically reliable...” (Legris, Ingham, & Collette, 2003, p. 202). The framework was flexible and offered a subjective measurement of the customer’s attitudes in keeping with the quantitative approach and the researcher’s pragmatic ontology. Accordingly, with confidence, the TAM-based questionnaire was employed.

A letter of introduction accompanied the online questionnaire, explaining the rationale for the research (Appendix B). The letter included an overview of the study and an invitation to participants to contact the researcher if they would like any more information. At the beginning of the online questionnaire, an introduction to the research study was given to the participants. The response rate was 8% which was above the average marketing response rates of 5% commonly experienced with Internet-based surveys (Cook, Heath, & Thompson, 2000). The questionnaire offered the opportunity for the respondents to add comments at the end if they wished to make a suggestion or to elaborate on their experiences. The database was selected from the working databases of the distributors and a generic database purchased from a reputable third-party provider to counteract bias in the sample. The standard TAM questions, together with reversed questions, used and the constructs they are measuring is also shown in Table 4.1 below. The three questions (highlighted) at the end of the questionnaire instrument were the critical areas of interest of the pilot study.

Table 4-1– TAM questionnaire

TAM Question	TAM Constituent
I would find data logging useful in my job.	Data Logging Anxiety/Attitude
Using data logging would allow me to perform experiments faster and more efficiently.	Effort Expectancy
Using data logging would increase my productivity.	Effort Expectancy
If I use data logging, I will increase my chances of promotion within the school.	Social Influences

TAM Question	TAM Constituent
My interaction with the data logging would be clear and easy to understand.	Data Logging Anxiety/Attitude
It would be easy for me to become skilful in using data logging.	Data Logging Anxiety/Attitude
I would find data acquisition technology easy to use.	Data Logging Anxiety/Attitude
Learning to use data logging will be easy for me.	Usage Intention
Using data logging technology is a good idea.	Acceptance Motivation
Data logging makes teaching more interesting.	Performance Expectancy
Working with data logging technology is fun.	Acceptance Motivation
People who influence my behaviour think that I should use data logging technology in my class.	Social Influences
People who are important to me think that I should use data logging technology.	Social Influences
In general, my school has fully supported the use of data logging technology.	Organisational Facilitation
I have the resources necessary to use data logging technology.	Organisational Facilitation
I have the necessary knowledge to use data logging technology.	Organisational Facilitation
I know where I can go to get help if I need it.	Organisational Facilitation
I would still use data logging in a classroom even if there were no one around to tell me what to do as I go.	Usage Intention
I would use data logging if I had sufficient time to prepare for the class.	Usage Intention
I would use data logging if I had sufficient support materials with it.	Usage Intention
I feel apprehensive about using data logging technology.	Data Logging Anxiety/Attitude
It scares me to think that I could lose my entire experiment by not knowing what functions to select.	Data Logging Anxiety/Attitude
I fear using data logging technology without adequate training and support.	Teachers as sales agents (boundary agents)
Data logging technology is somewhat intimidating to me.	Data Logging Anxiety/Attitude
I intend to purchase at least some data logging technology in the next 12 months.	Purchase Intention
I would be more convinced to purchase data logging if recommended by another teacher.	Purchase Intention
I would feel more comfortable buying data logging technology if I attended a workshop conducted by a current or retired teacher.	Purchase Intention

The purpose of the survey was to uncover the opinions that teachers (customers) harboured toward using data logging in their classrooms as an alternative or additional method of teaching science. The survey design was particularly applicable because it allowed for the economy of design and

rapid deployment to an extensive database. Such an approach also facilitated a quick turnaround in data collection (Creswell, 2009). The majority (80%) of the data collected was in the first four days of the release. The questionnaire remained live for a further two weeks after which time it was closed. In keeping with the empirical findings and with the vast body of scholarship on the TAM framework, the internet-based self-administered questionnaire was deemed most suitable. (Maleki, 2011; Nesbary, 1999).

4.5 The Qualitative Study – Methods of Data Collection

The greater importance of the qualitative to the research is reflected in the focus of the RQs and the conceptual model. The study aimed to explore key VRIO resources for competitive advantage in SMEs operating in the science education market and the contribution of boundary agents therein. Accordingly, multiple case-study methods were chosen as the most appropriate methodology. The approach facilitated analysis from different sized SMEs in different regions of Europe and is considered to be a suitable and effective method to study a specific area of interest (Eisenhardt & Graebner, 2007). The approach is specifically suited to this study because multiple case analysis facilitates in-depth exploration of the contextual factors underlying the creation of VRIO resources (and possible dynamic capabilities) in SMEs (Kindström, Kowalkowski, & Sandberg, 2013). The qualitative study was expected to create an extended and refined conceptualisation of how micro-foundations are created, discarded and reconfigured through the agency of boundary agents in SMEs in an educational market context.

4.5.1 Selection Rationale for Case-study Firms.

Purposive sampling has been used previously in the studies of SMEs concerned with firm agility (Dyer & Shafer, 1998), inter-organisational competitive advantage (Dyer & Singh, 1998), knowledge generation and absorption (Barrales-Molina, et al., 2017), boundary-spanning (Carlile, 2002, 2004) and resource configuration (Tallott & Hilliard, 2016), and value creation and capture (Makadok & Coff (2002)). The argument put forward from these studies is that ‘purposive sampling’ is more suited to getting at the “heart” of the research issue.

The main criteria for selecting the participating organisations were based on the insights from the literature and feedback received from the pilot study. Since the focus of the research is on competitive advantage in SMEs and the contribution of boundary agents and specialist salespeople to capturing and creating value through VRIO resources to this process, the following criteria were deployed:

- Selection of candidates who have been distributors for four years or more.
- A range of SME sizes in terms of employees (1-9, 10-19, 20+).

- Sales histories in the recent past (1-3 years ago and 3-5 years ago) showing evidence of change.
- Distributors who employ boundary agents with at least one that does not.
- Distributors were reporting only to the European office of the manufacturer.

The five criteria were applied to the purposive selection of appropriate cases from a population of firms acting as distributors of the manufacturer were designed such that:

- There should be a range of firm sizes to give a richer understanding of the necessary VRIO resources for competitive advantage.
- The case firms should be accessible, and for reasons of practicality, be conversant in English.
- The case firms should be capable of delivering qualitative richness and diversity of data (Kindström et al., 2013) and each case company capable of standing alone as a unit of analysis (Eisenhardt & Graebner, 2007; Kindström et al., 2013; Yin, 2003).

Following the advice offered by Gibbert et al. (2008), regarding the pursuit of superior generalisability of the findings, purposive (or often called theoretical) sampling was more appropriate than statistical sampling. In the final selections, the participant companies were based in Belgium, Croatia, the Czech Republic, Estonia, Germany, Holland, Iceland, Poland, Slovakia, Turkey, Ukraine and the (UK) – shown in Table 4.2.

Table 4-2 – SME distributors in the European region.

Country	Length of time as a distributor (yrs.)	No. of employees			Recent sales history		Number of boundary agents employed/used
		1-9	10-19	20+	Last 1-2 yrs.	Last 3-5 yrs.	
Austria	9	✓			→	↗	0
Belgium	13		✓		↑	↑	2
Bulgaria	4		✓		↗	-	1
Croatia	4	✓			→	↗	2
Czech Rep	9	✓			↑	↑	2
Denmark	14		✓		→	↗	4
Estonia	14	✓			↗	↑	1
Finland	17		✓		→	↑	1
France	16	✓			→	→	0
Germany	11			✓	↑	↑	3
Greece	8	✓			→	→	0
Hungary	5			✓	→	→	0
Iceland	7			✓	→	→	0
Ireland	12			✓	↑	↑	2
Italy	14		✓		→	↑	0
Latvia ¹	12	✓			↑	↑	2
Lithuania	5		✓		→	→	0
Netherlands	7			✓	↑	↑	2
Norway	6		✓		↑	↓	2

Country	Length of time as a distributor (yrs.)	No. of employees			Recent sales history		Number of boundary agents employed/used
		1-9	10-19	20+	Last 1-2 yrs.	Last 3-5 yrs.	
Poland	8		✓		→	↓	1
Portugal	14		✓		→	↓	1
Romania	3	✓			-	-	0
Russia	8			✓	↓	↑	0
Serbia	3			✓	-	-	0
Slovakia	14	✓			↑	↑	2
Slovenia	12		✓		→	↓	0
Spain	14		✓		→	↓	0
Sweden	17		✓		↑	↑	1
Switzerland	14	✓			→	↗	1
Turkey	6			✓	↑	↑	6
UK	17			✓	→	↓	0
Ukraine	4			✓	↑	↑	3

¹Latvia is included with Estonian data since there is joint ownership.

Key

→	No significant change in growth (0 to 9%)
↑	A significant increase in growth (>20%)
↗	Moderate growth (10-19%)
↓	Moderate decline (10-19%)

Austria was excluded because it is a subsidiary directly controlled by the German distributor with similar market structures. Therefore, it was considered that there would be no value-added data that would be significantly different from that of the German office. For a similar reason, Latvia was included as part of Estonia because of joint ownership and small, but similar, markets. Bulgaria, Lithuania, Norway, Romania and Serbia had not been active distributors for a sufficient period to gather any meaningful data. Russia was then eliminated because it had enjoyed unprecedented investment in education over the previous five years, where market capture was easy, and little competencies in science education were at all necessary. The elimination of Greece followed because of the extreme economic conditions experienced where educational spending altogether ceased. Finally, Ireland was eliminated because it is the seat of the European Headquarters of the manufacturer, and it is the office base of the researcher. The final list of distributors approached for participation in the final semi-structured phase was randomly selected from the last group shown in Table 4.2. Of the remaining distributors, thirteen were chosen for the final stage (shown as shaded in Table).

4.5.2 Semi-Structured Interview Protocol Design.

The use of the semi-structured interview instrument was selected as the primary data collection technique for the second phase of the study. It is also accorded a greater emphasis on the overall discussions and conclusions. The rationale for the semi-structured face-to-face interviews was threefold. First, to build on the quantitative data gathered in the exploratory pilot study identifying critical issues in the customers' reluctance to use technology in schools. Second, to compare and identify similarities in the understanding of the needs of the customers in terms of customer value by the distributors. Third, to strengthen the findings of the study and its applicability in practice and academic contribution. The interview respondents were drawn from the case companies and included (whenever available), CEO, General Manager, Marketing Manager, Sales Manager, Technical Manager and Boundary Agent.

A total of 23 interviews was conducted in 13 different dealers/SMEs, the total interview times accumulated to 25 hours. All firms were in the SME category and were family-owned. The list of semi-structured questions based on the themes derived from the literature review, as discussed earlier. The questions were guided principally by the dynamic capabilities and RBV frameworks categorising them as VRIO creation, customer value, sensing, seizing and reconfiguring (Barney, 1991, 1996; Barney & Clark, 2007; Dierickx & Cool, 1989b; Teece et al., 1997). The purpose of the main qualitative study was to determine the relevancy of boundary agents and specialist salespeople in the creation of VRIO resources that create and capture value and identify any other unique factors that contribute to competitive advantage.

The semi-structured interviews were audio-recorded for subsequent transcription. The participant interviewees were sent the resulting narrative as a precaution against any misunderstandings and errors on behalf of the researcher (Gibbert et al., 2008). Following the methodological examples of Eisenhardt (1989), Kindstrom et al. (2013), and Yin (2003), the analysis process was carried out in each case before making cross-case comparisons and pattern matching across and within cases. All of the interviews were transcribed and imported into a single NVivo dataset and categorised according to the themes that emerged. The empirical patterns that emerged were arranged and grouped according to the literature informing the research (Table 4.3 below).

Table 4-3 – RQs and associated rationale for methods employed.

Research Question	Method	Expected outcome
Does customer orientation develop VRIO resources and capabilities in SMEs that lead to competitive advantage?	Qualitative semi-structured interview	Determination of the development of VRIO resources through a customer focussed orientation that might lead to competitive advantage in the case-study SMEs.
What is the role of boundary agents in the creation of VRIO resources for value creation in SMEs?	Qualitative semi-structured interview	To determine the influence of boundary agents and specialist sales people in the development of VRIO resources and competitive advantage.

The interview protocol consisted of 30 open-ended questions under four main groupings of sensing/seizing, knowledge capabilities, boundary agents and managerial activities. The protocol acted as a guide for the interview process and was not rigidly enforced to allow free expression from respondents. The protocol ensured that the themes necessary to answer RQs 1 and 2 were adequately covered. Interviews stopped when theoretical saturation was achieved (Creswell, 2012; Plano Clark & Creswell, 2014).

When contacting the multiple case-study firms, a covering letter was sent by e-mail, outlining the invitation to participate, and the reasons their firms were selected. After accepting the invitation, interviewees were identified and sent an e-mail of introduction to the study. The introduction narrative contained an overview of the research project and the aims and the objectives of the research along with an explanation of the reasons why the study is being conducted and a brief summary of the strategic management theory to contextualise the research. Main definitions, propositions, confidentiality issues and audio recording requests comprised the remainder of the introduction. Bryman & Bell (2011b) suggest that the dependability of the research can be strengthened by the researcher offering to send the list of questions and interview guide to interested readers prior to the interview. In all of the cases, each respondent requested prior sight of the questions, so they could adequately prepare their responses.

The research followed an abductive approach (discussed in more detail in section 4.5.5) which facilitates the iterative process of progressively focusing as the interviews progressed. Following the Template Analysis (TA) approach (discussed in Section 4.5.6), data collection and analysis took place as soon as possible after each interview, thus preserving the inter-relational and iterative processes between each interview. Therefore, this approach allowed the researcher to investigate areas of interest not covered in the first draft of the protocol and add them to subsequent interviews through new additions of questions (Appendix B).

4.5.3 Criteria for selection of interviewees

Twenty-three people were interviewed during the data collection stage. The main criterion for the selection of interviewees was their ability to provide the researcher with the necessary information, knowledge and experience to answer the research questions adequately. Hence, this selection process was not randomised but purposive. Due to the sensitivity of the commercial information, the respondents were given the right to refuse to be recorded. All recordings were deleted shortly after transcription if the participants requested, and transcripts were sent to the respondents for confirmation of accuracy after transcription.

The unit of analysis in the research is the individual worker and boundary agent. The owner and entrepreneurs of the case study SMEs provided valuable and rounded insights into the competitive challenges they faced and hence proved to be the right choice for the study. The rationale for the varied profiles of interviewees was to minimise the scope for bias by respondents through their interpretations of the questions. The participant companies with individual contributors are summarised in Table 4.4.

Table 4-4– Participant firms in Phase 2 (semi-structured interviews).

Participant company	Location	Interview 1	Interview 2
PC1	Kiev, Ukraine.	P1	
PC2	Prague, Czech Republic.	P2, P3	P2
PC3	Rijssen, Holland.	P3, P4	
PC4	Leicester, United Kingdom.	P5	
PC5	Eberbach, Germany.	P6, P7	P8
PC6	Reykjavik, Iceland.	P9, P10, P11	
PC 7	Michalovce, Slovakia.	P12	P12
PC8	Ankara, Turkey.	P13, P14, P15	
PC 9	Antwerp, Belgium.	P16	
PC10	Helsinki, Finland.	P17	P17
PC11	Raciborz, Poland.	P18	
PC12	Zagreb, Croatia.	P19, P20, P21, P22	
PC13	Tartu, Estonia.	P23	

Legend: PC1 = Participating Company 1; P1 = Participant 1 and so on.

4.5.4 Data Collection Process

Within the TA structure (section 4.5.6 will elaborate further) guided the extraction of the data to be grouped into distinct firm capabilities in the form of tree nodes. The TA approach permits comparison of finding between different cases (firms) and thus aids in the robustness and validity of the results (Kindström et al., 2013; King, 2014). The results of the TA were interpreted against the backdrop of the literature relating to boundary spanning, knowledge management and dynamic

capabilities through abductive reasoning. Consistent with the TA protocol and pragmatic approach, abduction is not restricted to or associated with any particular methodology (Lipscomb, 2012). Abductive reasoning (also called abduction, abductive inference, or retroduction) is a form of logical inference which starts with an observation then seeks to find the simplest and most likely explanation. The attraction of the abductive approach for this study is that the process facilitates integration from both inductive (Pilot Study 1) and deductive (Qualitative Study) data (Alrajeh, 2012). Dubois and Gadde (2002) found abductive more useful than just the use of the pure inductive or deductive approach. The integration of inductive logic and TA is explained as part of the data collection process in Figure 4.4 following. Before discussing the TA procedure, a short discussion on abductive research precedes it.

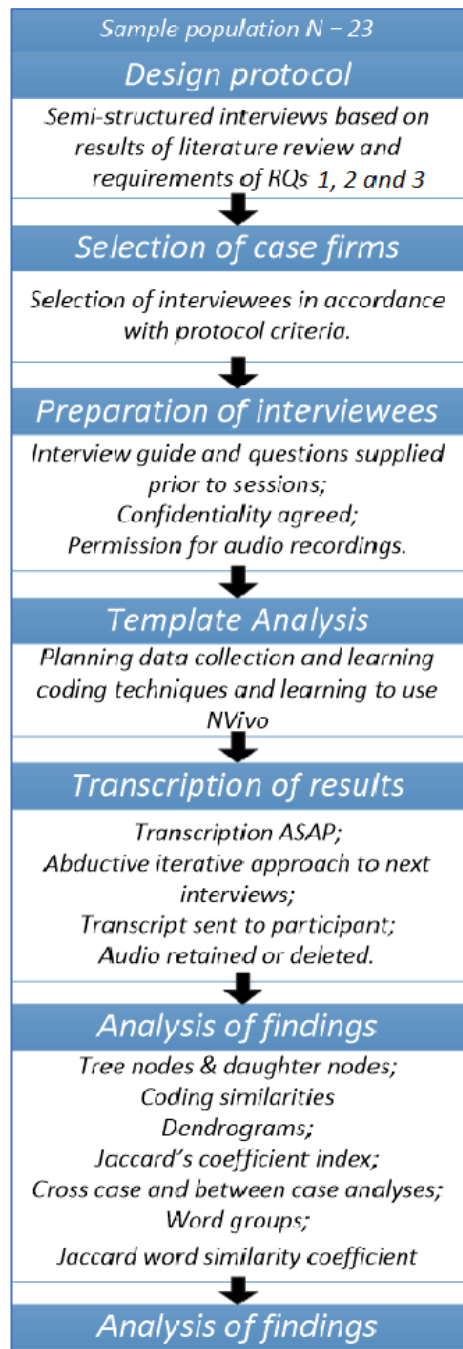


Figure 4-4 – Data collection process

4.5.5 The Abductive Approach.

The constant movement of interpretation between the theoretical input from the literature and the semi-structured empirical findings allows for a deeper contextual depth in the research. This systematic process of “switching” of iterative cognition within the TA is known as an abductive approach (Dubois & Gadde, 2002). Using the abductive approach, the semi-structured data was analysed then processed into general groups (free nodes), the regrouped (tree nodes) and, finally systematically organised into discrete related themes (daughter nodes). The interviews with the

dealers/SMEs provided the opportunity to delve deeper into how they accurately perceived and understood the concerns of their customers. This was one of the “qualifying” conditions of VRIO building within the firm in the context of the RBV.

An inductive approach may have certain advantages in this research, as the researcher can base the qualitative phase on prior experience and professional knowledge (Saunders et al., 2014). Saunders also suggests that such a “descriptive framework” within a deductive approach will need to rely on the prior experience of the researcher to guide the “...start and the analysis of the data” with an “exploratory framework” (Saunders et al., 2014, p. 549). Because of the prior industry and commercial knowledge of the researcher, such a position is of significant value; however, the rich data from the qualitative phase should not be biased or misinterpreted because of this prior knowledge and preconceptions. Abduction was chosen for three reasons:

1. First, abductive reasoning involves the researcher deciding what most likely inference(s) can be deduced from a set of data. Case studies based on abduction thus requires an integrated approach (Dubois & Gadde, 2002). The method of continually going back and forth between empirical observations of the semi-structured interview data. The extant theory expands the understanding of both phenomena and “...stems from the fact that theory cannot be understood by empirical observation and vice-versa...” according to Dubois & Gadde, (2002, p. 555). Therefore, combining elements of induction and deduction, the evolving abductive TA framework directs the researcher to the more profound meaning and to confront theory within the empirical world of the SME.
2. Second, abduction with TA facilitates the prior professional knowledge of the researcher while still elaborating on a predetermined set of questions guided by the framework proposed by Teece et al. (2007) and the data received in the research.
3. Third, the approach reduces the influence of the researcher in the data gathering process and allowing the findings to develop a coherent theory as explanations of how competitive advantage is achieved in the case-study SMEs.

A net result is an abductive approach within a predominately inductive approach. In this sense, the researcher was able to devise a theoretical or descriptive framework connecting variables, components, themes and issues and perceive and/or predict relationships between them and hence, guide the research in a fruitful direction (Yin, 2009). The discussion will now continue with an overview of the method used to gather and analyse the data from the main focus of the research through a qualitative approach. The approach borrows from some of the structures of the principally

inductive grounded theory using an abductive approach known as Template Analysis (TA) (King, 2012).

4.5.6 Template Analysis (TA) Method

The rationale for adopting the TA approach rests on four factors. First, the flexibility of the approach allows for reflexivity during the investigation process, and for the inclusion of a priori themes informing the primary research conducted through a qualitative phase derived from the literature, and in addition the exploratory quantitative pilot data. Thus, the attractiveness of TA for this study resides not only in its flexibility but in its allowing the researcher to be directly involved in the industry and the research process at the same time because TA is not as prescriptive as to the grounded theory approach (King, 2014).

Second, using a template aids the research as an analytical instrument “...through which to devise an initial conceptual framework that subsequently will be revised and then finalised as a means to represent and explore key themes and relationships in the data.” (Saunders et al., 2014, p. 574). Accordingly, the researcher can use the flexibility to build on his prior knowledge and experience in the industry.

Third, there are fewer specified procedures, permitting the researcher to mould the approach to meet the specific needs of the research study employing a pragmatic approach which is less time consuming (King, 2012).

Fourth, the method answers the call for inductive and emergent research in SMEs value creation and capture in RBV terms and competitive advantage. The use of a pragmatic case-study approach builds towards a multi-paradigm understanding of the constituent factors underpinning firm dynamics and ultimately, competitive advantage in SMEs.

Fifth, the TA method frees the researcher from the rigid constructivist grounded theory approach of other methods. The approach allows the researcher to employ a pragmatic epistemology, facilitating a clearer understanding of the personal ontology and epistemology of the participants during the semi-structured interviews. This is important because personal epistemological assumptions of business managers in SMEs “...cultivate corresponding behaviours and actions...” (Reybold, 2002, p. 537).

In the context of this study, the pragmatic epistemologies of the interview participants are manifested in two ways: everyday business decisions and knowledge creation and co-creation. Therefore, the

researcher is interested in how the manager makes sense of their working environment and how decisions are made and how they impact the managerial choices in the creation of the VRIO resources of the firm's quest for competitive advantage. TA allows for a pragmatic epistemology (or epistemic pragmatism) that considers primacy of practice(s) in SMEs. It also recognises the social and organisational aspects of the personal epistemology of the actors (Long, 2002). It is a style of thematic analysis that offers flexibility to the researcher to adapt the methods used to their particular research demands while still offering a high degree of structure in the analysis of narrative data (King, 2012). The template has been in use for more than ten years and has grown steadily since its inception and has extensively used to analyse data from individual interviews (Symon & Cassell, 1998 cited in King, 2012). TA is "...not a complete and distinct technology, but rather a technique that may be used within a range of epistemological positions..." (King, 2012, p. 427). The approach still follows general principles of data collection (Saunders & Lewis, 2012; Saunders et al., 2009, 2014) and has been suggested to be a hybrid approach of grounded theory and data reduction by Dey (1993, cited in Saunders et al., 2014) It is, therefore, not restricted to any single theoretical approach. In the case of this research, the TA borrowed from the ideas of Miles and Huberman (1994) on theories of data reduction, and also Strauss and Corbin (1998) using the grounded theory approach to coding and data analysis.

Grounded theory can be highly structured and dependent on the precise strategy that is employed, but still "...needs an element of interpretation even when following its most rule-bound models" (Saunders et al., 2014, p. 556). Coffey and Atkinson (1996, cited in Saunders et al., 2014) suggest that the use of a procedure that relies on the interpretation of the researcher should not imply any less analytical vigour. Grounded theory does not permit prior specification of any codes to analyse data since it is purely an inductive approach (Saunders et al., 2014). TA, on the other hand, combines inductive and deductive approaches within its abductive umbrella. The abductive dualism allows for the pre-determination of the codes, and subsequent amendment, if necessary (Saunders et al., 2014). TA guides the researcher to follow the general principles of analysing data through well-defined steps, as shown in Table 4.5. Once the data is collated, aggregated, and organised, the next key stage is "Action 3" where the key themes are identified.

Table 4-5 - Procedures for data analysis (Saunders et al., 2014, p. 557).

Action	Procedure
1	Comprehend the large and disparate amounts of qualitative data.
2	Integrate related data drawn from different transcripts and notes (memos).
3	Identify key themes or patterns from them for further exploration.
4	Develop and/or test theories based on apparent patterns or relationships.
5	Draw and verify conclusions.

Using a template aids the research as an analytical instrument “...through which to devise an initial conceptual framework that subsequently will be revised and then finalised as a means to represent and explore key themes and relationships in the data...” (Saunders et al., 2014, p. 574). Therefore, TA can be considered a more flexible approach, as compared to grounded theory, according to King (2012, 2014). There are fewer specified procedures, permitting the researcher to mould the approach to meet the specific needs of the research study employing a pragmatic approach that is less time consuming (King, 2012). In summary, TA is a “...technique rather than a methodology, which can be used from varying philosophical positions.” (King, 2012, p. 429). The approach is suitable for this study in that it encourages the researcher to be flexible in the structure of the coding, the use of a priori themes, and the use of the initial template design (King, 2014). Section 4.5.7 (following) explains the coding mechanisms employed using NVivo (v11).

4.5.7 Coding Schemes

Patterns and relationships can be handled in programmes such as NVivo, where the codes and categories can be shown in their hierarchical structure, with groupings of data around common or shared themes, as tree nodes (with daughter nodes) and free nodes in NVivo. Saunders et al. (2014) suggest that as the data collection proceeds, the nodes may take on different characteristics and may need to be labelled differently in accordance with the abductive approach used. The suggestion is that a systemised self-memo procedure was implemented so that a trail of reasoning is available for consultation at a future stage in the writing-up process. King (2012, cited in Saunders et al., 2014, p. 573) suggests five ways in which a template may be reorganised to suit the research needs:

1. Insertion of new code into the hierarchy as the result of a relevant issue identified through data collection for which there is no existing code;
2. Deletion of code from the hierarchy if it is not needed;
3. Merging codes that were initially considered distinctive;
4. Changing the scope of the code, such as altering its level within the hierarchy;
5. Amend the higher-order classification.

Following the advice of Bazeley (2007) in working with NVivo, the first step was to create free nodes based on the main themes from the literature discussed in Chapter 2. Six free nodes were created before the start of the semi-structured interviews: (i) knowledge capabilities, (ii) VRIO resources (iii) boundary agents, (iv) sensing of opportunity, (v) seizing of opportunity, and (vi) value creation and capture. As the semi-structured interviews were coded, additional sub-categories were added as tree nodes and tagged to the most appropriate free nodes (if relevant). This approach is recommended by Ashill and Jobber (2009), as it leads to more comprehensive item generation and is congruent with the pragmatic epistemological approach.

4.5.8 The Multiple Case-study Protocol

“The case-study design is characterised by the collection of substantial amounts of both qualitative and quantitative data...” (Robson, 2011, p. 492). This data collection can proceed simultaneously, or by one preceding the other. Bryman (2006) suggests that exploring connections between the qualitative and quantitative data can have some value for the research and takes fuller advantage of the potential of multi-strategy designs. Onwuegbuzie & Teddlie (2003, cited in Robson, 2009) suggest that both sets of data can show a “dynamic interconnectedness”. This can also affect that “...both data forms provide supplementary and supportive information” (Caracelli & Greene, 1993, pp. 200-201). In some cases, the integration of both datasets leads to a new variable. In using a framework to combine both paradigms, the TA allows the flexibility of approach, while still borrowing from elements of grounded theory approach.

The importance of the protocol used is emphasised by Yin (2009) as it can increase reliability in a major way. This is the case whether it refers to a single or multiple-case study. In general terms, Yin (2009) suggests that a case-study protocol should contain sections outlining the project objectives and the relevant supporting literature. Besides, there should be clearly guided procedures for fieldwork, ranging from the language used, protection of the human subject and data confidentiality. The issue of case-study questions is also addressed by Yin (2009), where the specific research questions are borne in mind throughout the semi-structured questions. The major advantage of establishing a protocol is that it equips the research to anticipate and handle any unexpected problems. A protocol also helps focus the researcher on the true nature of the research and who the audience will be. The procedure to gather data was in two parts. First, a within-case analysis of each firm using the abductive TA approach where the components of the ‘black-box’ of the elements that comprise the creation of VRIO resources were allowed to emerge from the data (Eisenhardt, 1989). This allowed the researcher to become familiar with each case that, in turn, accelerates cross-case comparisons at a later stage (Fischer et al., 2010). Furthermore, the process allows the researcher’s epistemological view to evolve with the data. Second, a cross-case analysis applies the emergent conceptualisation of the ‘black-box’ of the critical VRIO resources to allow comparisons (similarities and differences) between the 13 case-study firms.

Consistent with the pragmatic philosophy of the researcher, an abductive approach is applied to the within- and cross-case comparisons. Following TA, the narrative develops by arranging themes delineated from the interview data to delve inside the ‘black-box’ of the creation and composition of VRIO resources and gain an insight into the ‘micro foundations’ phenomenon underpinning them. Accordingly, the abductive paradigm facilitates the disaggregation of the building blocks of VRIO resources and the consequent value creation, and then the possible value capture, to emerge. The

researcher is then in a better position to consider if the VRIO configurations that underpin competitive advantage from the interview narrative using TA are quantifiable.

The semi-structured questions were based around the themes delineated in the literature of the RBV theory, customer focus, KAM, boundary spanning, and dynamic capabilities were grouped around the following headings: VRIO resources and competitive advantage; micro-foundations of external sensing of dynamic capabilities; external seizing of dynamic capabilities; external reconfiguring dynamic capabilities; knowledge generation and sharing capabilities; and, boundary-spanning with KAM. The main headings were derived from the main themes concluded from the literature. Specifically, they were chosen as they represented VRIO resources and capabilities that can lead to competitive advantage in the market. The form and sequence of the multiple-case study of the 13 case-study SMEs is summarised in Figure 4.5(following).

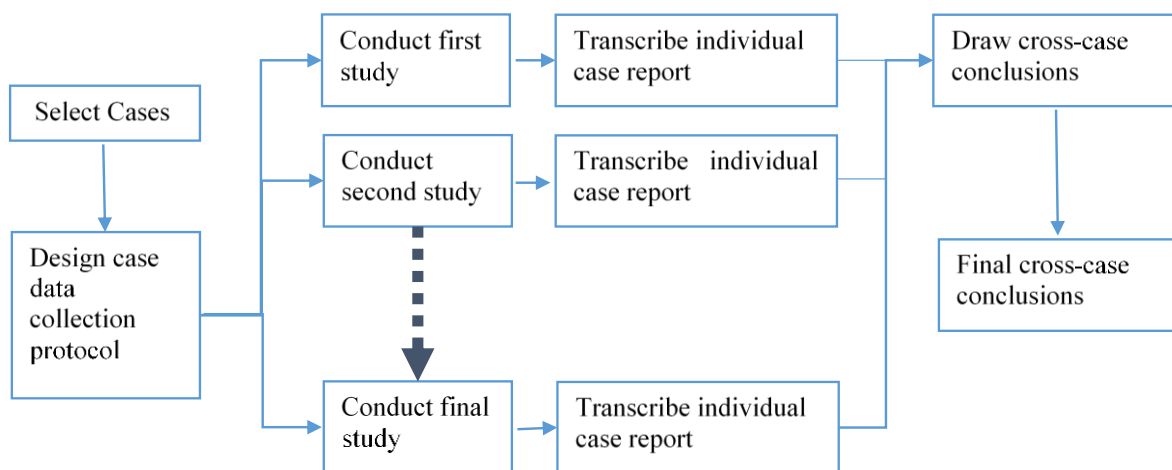


Figure 4-5 – Case-study data collection procedure (source: Author)

Yin (2009) also advises using matrices, frequencies of events, creating data display and tabulating data in chronological order as a method of increasing reliability. Since this NVivo (discussed above) adequately handles all these attributes, no further discussion is necessary.

4.5.9 The role of the Researcher

On the advice gleaned from Saunders et al. (2014), the researcher established early a relationship built on trust between the researcher and the respondents during their contacts. The researcher was also aware that the informants might have wished to give answers the researcher would have liked to hear (Yin, 2009), or conversely, informants may have reasons to hide certain information. Establishing mutual trust and be aware of the possible effects of reflexivity requires experience in searching for reliable sources of evidence. In other words, the researcher should not lead the answers to questions, nor be the instrument of any causal effects.

The researcher acknowledged the role and influence exerted during the study in his capacity as CEO of the European subsidiary. The researcher effect was a concern during the qualitative research involving semi-structured interviews with the selected dealers. The researcher was also cognisant of the potential for abuse of his power and the danger that the dealers would frame their answers to be as favourable as possible as to what they anticipated the CEO might want to hear. It was for this reason that the questions posed in the semi-structured interview sessions were considered with reference to the exploratory pilot study conclusions.

The steps taken to nullify this effect can be summarised as follows:

- The framework for the questions was based on the RBV conceptual model for competitive advantage (Figure 3.1 earlier).
- No specific information was sought on the company that might be confidential or sensitive.
- Each participant was briefed by e-mail two weeks before the interview about the purpose and reasons behind the study.
- SME managers were told that participation was not mandatory and, even after participation, they could withdraw at any time.
- Although participants were selected according to strictly stratified sampling criteria, there has been a relationship of trust and mutual respect that has been developed over many years. On that basis, the researcher was confident that all responses would be honest, open and expressive.

4.6 Ethical Considerations

The research was guided by the four main areas of concern suggested by Diener & Crandall (1978, cited in Bryman & Bell, 2011a) namely:

- Is there informed consent?
- Is there a danger of invasion of privacy?
- Is there any hint of deception involved?

While some of these areas of principled action might overlap, these four criteria have guided the content, direction, and execution of the research. Bryman & Bell (2011a, p. 128) also concur in that there is “...no doubt that these four areas form a useful classification of ethical principles in and for business research...”

4.6.1 Informed Consent

According to Bryman & Bell (2011), the area of “informed consent” is one of the most hotly debated areas in business research. However, this mainly focuses on overt observations, which played no part in the methods of this research. Informed consent also extends to fully informing the participants of

the nature and purpose of the study. In this study, the participants have clearly explained the aims and objectives of the research, and also the nature of the questions and why they were posed. A brief description of the conceptual dynamic capability framework was explained and the reasons for the questions and their structure.

4.6.2 Invasion of Privacy

The issue of invasion of privacy is sensitive in all areas of research, and the researcher needs to be cognizant of the boundaries over which they should not venture. The notion of privacy is very much linked to the concept of informed consent, according to Bryman & Bell (2011). This is so because the “degree of informed consent is given on the basis of a detailed understanding of what the research participant’s involvement is likely to entail” (Bryman & Bell, 2011, p. 136). This resonates with Denscombe (2010, p. 332) who advises that “participation must always be voluntary.” The researcher should, therefore:

- Make it very clear that participation is voluntary.
- Provide participants with adequate information about the research.
- Specify what kind of commitment is being required of participants” (Denscombe, 2010, p. 333).

Concerning this research, the senior managers within the firms have had a relationship with the researcher over many years, and a high degree of trust and friendship has been fostered over the years. However, the researcher exercised caution in dealing with the participants, and great care was taken to reassure them that the data being collected was absolutely and categorically not for purely commercial reasons. Still, the only use for it was in the completion of the researcher's PhD thesis.

4.6.3 A Reflexive Discussion of the Study

There has been a proliferation in recent times of the number of researchers undertaking research within their institutions. The numbers are continuing to rise, and so there is an increasing need to examine the unique challenges ‘insider’ research presents (Floyd & Arthur, 2010). This section discusses the ethical and moral dilemmas that confronted the research in terms of ‘insider’ research. Any research conducted has implications for those involved. This final section in the methodology chapter argues that undertaking interpretive insider research within your institution or organisation makes these implications even more acute. Although undertaking insider research can be problematic, it is argued that researchers should be able to enter the research with confidence, as long as the appropriate ethical boundaries are established at the outset and re-visited continuously throughout the process.

Therefore, this section, with the research methodology chapter, will examine the ethical and moral dilemmas confronting ‘insider’ researchers from the literature. Undertaking “insider” interpretive research from a pragmatic philosophical position within a group of organisations in which the researcher is involved has implications for all of those involved. The mere fact that the researcher is known to the participants makes these implications more acute.

Therefore, in considering the implications that can arise from conducting ‘insider’ research, the following discussion will review the literature in this area around the key issues surrounding gaining access, anonymity, researcher bias and power. The researcher acknowledges that undertaking insider research can be problematic. However, the view held by the researcher is that as long as the appropriate ethical guidelines are followed and continuously revised with the ethical boundaries are established at the outset, a successful and worthwhile study can be achieved.

The following discussion will start with an overview of ethics in research in relation to the ethical guidelines defined by Birmingham City University. Next, “insider” participatory research ethics will follow and the implications for ethics and the university guidelines. Finally, the issue of power balance between the researcher and the participant will be reviewed, both for the literature in the area and personal reflection from the researcher. Finally, a conclusion will evaluate the methods and methodology employed in the study through the lens of ethical principles adopted by the researcher.

4.6.4 The Ethics of Insider Research

Given the duality of the researcher’s involvement in the study as an academic and a practitioner, the ethical responsibilities are greater than that of an arms-length study. While the ethics as prescribed by the university were strictly adhered to, additional controls were introduced because of the sensitive nature of commercial secrets. The relationship between the researcher and the participants in the study has been established over many years of collaboration and was cordial at all times. Therefore, the sense of duty to ethics impeded reporting and analysing the entirety of the evidence to support the claims in the findings. There is a sense that as working as an insider researcher that access to willing participants is easier. As Floyd and Arthur (2010) also discovered, this is not always the case. Not alone are the self-imposed restrictions in reporting the totality of the finding more challenging to prove the propositions underpinning the RQs, the “ethic of care” means that certain avenues of rich data cannot be interrogated if it is commercially sensitive.

On the positive side, the sense of closeness with the participants was higher than experienced before in the normal business meetings. The sense of intimate shared knowledge enhanced a higher sense of trust and relational responsibility that has endured. Kvale (1996) comments on the asymmetry of power in research interviews weighted towards the researcher; however, any sense of such a power imbalance was constantly in the mind of the researcher. On reflection, the conclusion of the research

process was there was no sense of unease or a desire to provide responses that were most pleasing to the researcher. The conclusion is based on the following observations:

- All participants were asked before, and after the interview, if they wished to withdraw any of their contributions.
- Requested to return to some SMEs for further investigation into some interesting areas, were enthusiastically welcomed.
- Confidential information given in the interviews were requested to be removed from the final transcripts.
- There were full and frank discussions when some topics were covered, demonstrating that there was no sense of embellishing the interview in a purely positive way; the good, the bad, and the ugly was freely discussed.
- All participants were sent a script of the questions four weeks before the interview took place. There was ample time for participants to reject any questions or withdraw prior to the interview.
- The full transcript of the interview was sent afterwards to ensure that the researcher had accurately interpreted the answers provided.

Reflecting on the procedures adopted and the feedback from the participants, the researcher is satisfied that the approach taken was of the highest ethical standard. On further reflection, ethics is about awareness, understanding, monitoring and evaluating the consequences of the research. Thus, ethics is first and foremost about asking the questions and not about the answers that are given. The development of procedures and controls to ensure that the research is guided throughout by a strong ethical approach remains one of the most important lessons learned from this study.

4.6.5 Participatory research

Given that so many people are now engaged in part-time doctoral programmes whilst continuing with their regular employment, one might have expected a corresponding growth in the literature on the methodology of insider research. This does not appear to be the case.

While the literature in this area could hardly be described as extensive, there have been studies across a wide range of fields, for example, educational action research (Schön, 2017), sociology (R. K. Merton, 1972), ethnic studies (Zinn, 1979), and management (Cassell, 2005). Business research textbooks tend to gloss over the intricacies of insider research conducted at the researcher's place of work, or related organisations. Labaree (2002) recognises the issues and challenges facing the 'insider' researcher's and their attempts to navigate the "...hidden ethical and methodological dilemmas of 'insiderness'..." (Labaree, 2002, p. 109). A common assumption made about participant observation is that being an insider offers a distinct advantage in terms of accessing and understanding the culture of the organization(s) to which they are connected. Labaree's inciteful

observations questions the assumptions that being an insider offers a distinct advantage in terms of accessing and understanding the culture.

The assumption that research conducted by ‘insiders’ provides the researcher with greater access and deeper understanding is often true (Labaree, 2002). However, the level of the ‘insiderness’ can be influenced by numerous factors, some of which can be dictated by circumstances of the moment. The level of ‘insiderness’ is also dictated by the degree of access afforded to the researcher: monopolistic or privileged access. Merton (1972) views insider-outsider research as an epistemological principle centred on the issue of access. If the access is monopolistic, it can be assumed that the researcher possesses exclusive knowledge of the community and research participants. It is also likely that there is privileged access for the researcher, and perhaps, hidden knowledge that can perhaps inject a certain level of bias and power over the participants.

The alternative epistemological position is the idea of the outsider researcher being a ‘professional stranger’ who is detached from the organisation. Georg Simmel’s notion of the ‘professional stranger’ is used by Merton (1972) as an example of a researcher who can “...can more readily acquire objectivity...” Accordingly, questions can be posed that is unbridled with prejudiced views of organizational practice.

Merton (1972) is, therefore framing a doctrinal approach to insider and outside researcher based on the level of access which informs the level of intimacy of knowledge of the organization. The epistemological assumption is that intimate knowledge offers insights that are difficult or impossible to access by an outsider. Therefore, Merton provides a baseline to discuss the role of the researcher from an epistemological perspective framed through the lens of either monopolistic or privileged access. Accordingly, the role of the researcher conducting the interviews will be influenced by the epistemological approach used by the level of ‘insiderness’. The literature considers technical expertise as the most important issue, whereas the process of the interview is “...treated as an epistemologically neutral device for data collection...” (Cassell, 2005, p. 168). Where the research study is predominantly qualitative, the interview process must mean something more profound given epistemological assumptions held by the researcher informed by their level of ‘insiderness’.

While the literature recognises the duality of inside-outside research, in reality, it is not as clearly defined as that. For example, in this study, the researcher is conducting qualitative research on associated organisations, all of which are independently owned and operated and have no interconnection except through the researcher. The relationship that exists between the researcher’s organization and the participants in the collaborating organisations are just distributors of products in their respective territories. Therefore, the issues surrounding the level of ‘insiderness’ becomes somewhat objective. It is a question that cannot be answered purely from an assessment of the level of access alone. Since there exists a commercial relationship between the researcher’s organization

and the participant organisations, but there is no direct control through ownership, the view adopted is one of 'limited privileged access.'

4.6.6 Power balance

It is often assumed that there is an imbalance of power between the researcher and the interviewer in favour of the researcher. This is understandable since the interviewer sets the agenda, poses the questions, determines the parameters, undertakes the final analysis and makes conclusions (Flinders, 1997). It has been argued in the literature that, in some cases, respondents also exercise power, which affects the experience and outcomes of the research (Thapar-Björkert & Henry). While the circumstances of the study by Thapar-Björkert & Henry were related to researcher/researched interaction in the feminist methodological literature as non-white/non-western researchers in a non-western research setting, the study highlights the unexpected consequences that can materialise in qualitative research.

Mercer (2007) explores the challenges faced by educational researchers investigating the places where they work. In particular, she feels power relations to be an issue only if the researcher is in a more senior position than the participant. On the other hand, Mercer (2007) also acknowledges that in interviewing more senior respondents than herself, privileged information gained could cause a shift in the power relationship. The study serves to illustrate that the 'insider' research must proceed continually through thorough internal reflection by the researcher.

The sharing of power with the respondent during interviews has been discussed in the literature in both face to face, telephone and virtual spaces. Shuy (2002) suggests that respondents feel more empowered in a face to face setting where they can see and engage more with the interviewer. Stephens (2007) acknowledges that face to face interviews have an advantage over telephone interviews in that the respondents can engage more effectively if the interviewer is confused, indifferent, or not paying attention. The findings of Stephens were based on telephone interviews with 'elite' respondents. While the concept of what constitutes an 'elite' respondent is not clearly defined by Stephens (2007), he does refer to them in terms of their social position "...relative to the average citizen in society, they are still clearly in a position of power and raised social stature..." (p.204). On the other hand, in the same study, Stephens' experience of using telephone interviews was a successful one, concluding that less frequent and more 'directive shaping' of the interview is possible.

On the other hand, the potential loss of face may be stronger in face-to-face interviews, leading to respondents feeling social pressure, while there is less chance of that in telephone interviews (Taylor, 2002). The study by Stephens (2007) comparing face to face and telephone interviewing with 'elite' respondents was influential in this study for two reasons:

- (i) The respondents were considered to be ‘elite’ in their respective social circles being all successful business owners, and
- (ii) The relative affordances in the context of ‘elite’ respondents between face to face and telephone interviewing are also relevant, given the geographical diversity of case study companies.

Vogl (2013) also recognized that telephone interviews were more empowering to respondents than face to face. Interestingly, Trier-Bieniek (2012) showed that the use of telephone interviews allows a redefining of the relationship between researcher and respondent, particularly when considering a power dynamic in the relationship. Taylor (2002) also recognized the likelihood of the ‘loss of face’ in telephone interviews is significantly reduced, which is again a way to redressing the power balance. In cases where sensitive issues may be discussed, Mealer & Jones (2014) found that the telephone method was preferable as the power balance was “...Methodological and ethical issues related to qualitative telephone interviews on sensitive topics...” (p.35). Where the power balance may be an issue, albeit unknown to the researcher, the absence of the physical appearance of the interviewer may allow the respondent to be more relaxed and hence focus better on the questions (E. Smith, 2005)

4.6.7 Research bias

In the context of the main part of this study, there were two types of bias - participant bias and researcher bias. The former refers to respondents’ answers to the questions based on what they consider should be the correct answer, or what is acceptable rather than what is their true opinion. The latter is concerned with the researcher unknowingly interpreting data to suit their propositions or by including only data that is supportive of them.

Researcher (also called interviewer) bias might also include using leading questions, or questions in a specific sequence in order to prompt a particular response. Conversely, if the respondents harbour strong opinions about the researchers or the organisation they are representing, data could lead them to either agree with everything, or nothing (Seymour, 2001). Easterby-Smith et al., (2008) warn against researcher bias creep where responses are interpreted in a peculiar way by the interviewer. All attempts, unwittingly or otherwise, to impose the researcher's beliefs and frames of reference through the questions must also be carefully checked (Saunders, Lewis, & Thornhill, 2014). Denscombe (2010) also cautions comments creating bias through tone or non-verbal behaviours to the way respondents may answer a question. The foregoing discussions are all examples of instances where the essential element of trust between the researcher and participant must not be compromised and thereby destroy the credibility of the researcher and the research study.

Related to this is respondent (interviewee) or response bias. Perceptions about the scale, scope and *raison d'être* may be cause for suspicion or concern in respondents. The bias may not necessarily be

linked to the researcher, but to the organisation to which he belongs. Taking part in an interview is an intrusive process, especially in the case of semi-structured interviews. The researcher aims to delve deep and explore reasons and explanations on the chosen topic (Robson, 2011). Where private commercial interests are at stake, the need for ultimate discretion and confidentiality is paramount. The building of trust between researcher and respondent is the fundamental building block in order that sensitive information is used solely to build a picture for the researcher and not be made public knowledge. Unless this relationship can exist, the outcome of this may be that the respondent provides a partial 'picture', or worse, offering misleading responses.

Respondents who are not the owners of the enterprise may also feel compromised where probing questions that intrude on sensitive information that they do not wish, or are not empowered, to discuss (Saunders et al., 2014). Therefore, the avoidance of harm (non-maleficence) to employees is of paramount importance, where their emotional well-being may have been compromised during a particularly probing interview. Avoidance of leading respondents to provide answers that they think the researcher wants to hear is one of the most significant challenges. The literature is sparse in this area of 'courtesy bias' so a common-sense approach drawing on the experience of the researcher is necessary.

While altogether avoiding bias is impossible, there are several means to reduce it. Most importantly, the identification of a potential bias can aid in taking appropriate preventive measures. The section following discusses the different types of biases encountered and the appropriate preventative measures adopted. The following discussion will take the form of a full and frank reflection on the qualitative aspect of the study.

4.6.8 Ethical Approval

As part of the '9R' PhD registration process, ethical approval was sought under the 'BCU Research Ethical Framework of 23.10.11' was submitted to the Doctoral College on 8th March 2013 and was approved at the next FRDC meeting on 12th December 2013.

4.6.9 Conclusion and reflection

It is clear from the study that the main issues that were pertinent were that of the perception of power, bias, and the ethical element of handling sensitive commercial information.

To start the reflexive discussion, a short contextualisation of the role and professional position of the researcher is necessary. The researcher is employed in the European Head Office (EHQ) of the organisation, from where the independently owned distributors, who have exclusive distribution rights in their respective countries, receive their supplies. The EHQ also acts as a technical and customer support base where the researcher is the CEO. Due to the long-established business

relationship, company owners and senior managers are known to the researcher and enjoy a good rapport. Neither the researcher nor his employer exerts direct control or influence over any of the distributors in how they conduct their business. Thus, the relationship is between each organisation and the researcher's organisation exclusively. There is no common ownership between individual distributors, except for one organization in Estonia and Latvia. In this respect, the researcher had no authority over the distributors to insist that they were a participant in the study. Three distributors declined to take part in the study.

Kvale (1996) comments on the asymmetry of power in research interviews weighted towards the researcher; however, any sense of imbalance rapidly deteriorated through the course of the sessions. Munro, Holly, Rainbird, and Leisten (2004) correctly point out that the respondents also exercise power insofar that they do not have to divulge any information. After a great deal of personal reflection, the researcher concluded that there were still barriers to the level of frankness that might have been expected before the research. Mercer (2007, p. 7) identifies a potential danger of distortion where "...pragmatism may outweigh candour..." in insider research because the commercial relationship will need to continue after the study has ended.

While the balance of power was not weighted in favour of the researcher, there was a concern that the respondents will be biased towards answers to questions that will cast them in a good light. The researcher strived to allow respondents to use their 'own' voices and not be led or guided to a situation where 'courtesy bias' predominated. In the initial interviews, 'courtesy bias' could be detected from the lower management levels, so through the abductive reasoning set out in the previous section of this chapter, mechanisms were developed to minimise 'courtesy bias'.

Overcoming apprehension in the respondents was a key concern at the outset. To minimise any sense of unease, the engagement was enhanced in the following ways:

- greater emphasis was placed on maintaining a relaxed and informal atmosphere.
- in-depth explanations of why the interview was necessary.
- what the was value/benefit of the study to the respondent and their organisation.
- using straightforward language with no jargon to avoid intimidation.

The use of the telephone for some of the follow-up interviews was not initially intended. The expectation was that it would inhibit in-depth qualitative interviewing and rapport. The telephone interviews yielded rich data and encouraged the respondents to speak more passionately about the issues in their markets and the competitive behaviours of rivals. It cannot be determined if that level of openness was due to being follow up interviews of the previous face to face interviews, or not.

As the proliferation of professional doctorates increases, the need for continued research in the area of insider research will also increase. While insider research can be a potential ethical minefield, the

is no doubting that insider research can produce rich data within the appropriate ethical boundaries. Another novelty of this research is that the researcher was not a true insider in the context of the preceding literature. Instead, the relation was one of a close business associate from a different and unrelated (by ownership or management) organization. While no literature exists to guide the peculiarity of this study, a carefully considered ethical approach was adopted based on the professional experience of the researcher.

4.7 Summary of Research Methodology

The research comprised of an exploratory pilot quantitative, but the focus was on the qualitative phase. The technology acceptance model (TAM) was employed because it was a robust, technology focussed and extensively used psychometric test. The analysis of the data thus provided rich insight into the essential resources and capabilities the supplier should possess so that the customer feels confident in the adoption of data logging. The deployment of TAM in the pilot quantitative study not only allows for a substantial customer sample to be tested. The pilot study elucidated areas of potential interest in the focus of the research, which was the qualitative study.

The focus of the qualitative study was to determine what role the boundary agent working through managers or specialist technical salespeople played in the development of VRIO resources for competitive advantage in the thirteen case-study SMEs using a multiple-case study approach. The predominantly qualitative approach (although heavily skewed towards the qualitative methodology) also supported the researcher's ontological pragmatic approach and balanced the risk of bias against the researcher's epistemological position. Thus, the pragmatic approach has proved to be an insightful and rewarding journey to this research. The closeness of the researcher to the research topic and the relevance to the researcher's professional practice made the study both relevant and challenging at the same time.

The thirteen case-study SMEs were selected under three criteria. Firstly, to obtain a selection of SMEs would have been dealers over different periods. Secondly, to obtain a diverse range of company sizes. Thirdly, to ensure a wide range of history of high- and low-performance. The researcher was constantly aware of the potential for bias, and preconceived notions of the composition of VRIO inspired resources and value generation, therefore, the abductive approach was particularly helpful. Semi-structured interviews were consistent with the narrative approach (Miles & Huberman, 1994) and follow-up interviews were conducted 12 months later with selected dealers to explicate further detail around common themes and the quest for competitive advantage. The majority of interviews were conducted face-to-face with senior executives guided by a protocol consisting of a description of the data collection and its relevance and interview guides (Yin, 2009). The participants were asked questions grouped into themes of identifying value-creating strategies and also sensing, seizing and reconfiguring, therefore providing illustrations of how they interpreted

the 'micro foundations' of VRIO resources and/or dynamic capabilities in their organisations. Interviews were recorded and deleted after transcription if requested (Miles & Huberman, 1994). At the end of each interview, participants were invited to add additional comments. Detailed transcripts were sent to each participant for review, thereby reducing bias from the researcher. The approach allowed for familiarity to develop through abduction in every single case and then to move to cross-case comparisons.

5 Results and Presentation of findings

5.1 Introduction

The chapter discussion that follows concentrates in the main on the qualitative part of the research. The chapter will start with a brief overview of the initial exploratory pilot study. This quantitative pilot was undertaken solely to get an overview of any significant factors that would influence the decision if teachers (the customers), that might be available in the literature. The decision to only include the two most important and relevant questions from the extensive TAM-based questionnaire was based on two considerations:

- First, the majority of the questions were added unnecessary confusion to the rationale for adopting an exploratory study, and
- Second, all but the retained questionnaire items failed the test for normality of distribution. While the initial statistical treatment was extensive, the conclusions drawn added little to the primary purpose of the research.

In consideration of the reasons they were stated, only the small element of the exploratory research was retained as it pertained to the use of boundary agents as probable influencers in a decision to purchase and use data-logging technology.

The chapter is thus mainly concerned with the qualitative findings in the study. Armed with a degree of confidence that boundary spanning can be a significant influencer in the specific market of this study, the decision to include boundary-spanning as a key construct appears justified. The discussion that follows in Section 5.3 discusses the findings in detail aggregated around the key themes of the findings.

5.2 Exploratory Pilot Study

Since the emphasis in this study is on the qualitative data from the case study, this section will feature a summary of the pertinent findings that are directly relevant. The conclusion from the pilot study is that customers would be significantly influenced to purchase and adopt data-logging technologies if recommended by a colleague. This is directly relevant to the main body of the research – the qualitative study – since colleagues refer specifically to boundary spanners. The statistical analysis showed the statistical distributions across the TAM scales were largely not normally distributed

Cronbach's alpha returned an acceptable measurement of the 0.74 for the entire questionnaire. Tests of normality using Kolmogorov-Smirnov and Shapiro-Wilk outputs from SPSS shows that the probabilities are less than 0.05 and hence are significantly different from normal. Thus, subsequent regression analyses have been disregarded from further analysis.

Appendix D provides more detail of the calculations, but in summary, the Kolmogorov Smirnov statistic takes an average value **.322** (highest value 0.385, lowest value 0.191) **d.f.** = 3400, **p** = .000. Since **p** < .001 there is significant to reject the null hypothesis that the variable follows a normal distribution. However, it should be observed that values of **p** values greater than .05 is normal in large samples (Pallant, 2013, p. 66). For reasons outlines in Appendix D, we will not be concerned with non-normality of the distribution and will deploy an independent **t-Test** statistic as now presented.

Table 5-1 – Group statistics summary

Group Statistics					
	Are you a current user of data acquisition technology products?	N	Mean	Std. Deviation	Std. Error Mean
Q12	Yes	2895	4.8684	1.55601	.02892
	No	482	4.3361	1.60402	.07306
Q13	Yes	2886	4.9851	1.49573	.02784
	No	484	4.3306	1.56641	.07120
Q26	Yes	2899	4.6478	1.71658	.03188
	No	485	4.5113	1.64843	.07485
Q27	Yes	2899	5.1214	1.59226	.02957
	No	488	5.4262	1.42243	.06439

The following test is the independent samples t-test based on the four questions posed in the online questionnaire was most relevant to the study. The following questions were evaluated and compared against two independent groups: (i) users of datalogging technologies, and (ii) non-users of data logging technologies. The following Table presents the results of the independent t-test for all four questions:

- Q12. People who influence my behaviour think that I should use data logging technology in my class.
- Q13. People who are important to me think that I should use data logging technology.
- Q26. I would be more convinced to purchase data logging if recommended by another teacher.

- Q27. I would feel more comfortable buying data logging technology if I attended a workshop conducted by a current or retired teacher.

In Table 5.3, all questions returned a value for **p (2-tailed) <.05** (that is, $p < 0.05$) for Levene's Test there is a significant difference between both groups (users and non-user of datalogging technologies). Therefore, the null hypothesis that should be no significant differences and any difference are through pure chance is rejected. Indeed **p (2-tailed) <.05** (that is, $p < 0.05$) remains consistent for all four questions, accordingly there is a statistical difference between the two groups.

Since **p (2-tailed) <.05** for Levene's Test, therefore the assumption equal variance has been violated. Hence, the t – value will be for the calculated 'Equal variances not assumed'. Therefore, $t = 6.774$ in the case of Q12 and follows a similar pattern for the remaining questions (t values in bold).

Since **p (2-tailed) <.05**, there is a significant difference between users and non-users of data logging technologies.

Table 5-2 – Independent samples t-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Q12	Equal variances assumed	4.431	.035	6.923	3375	.000	.53229	.07689	.38154	.68305
	Equal variances not assumed			6.774	640.916	.000	.53229	.07858	.37800	.68659
Q13	Equal variances assumed	4.192	.041	8.848	3368	.000	.65452	.07398	.50948	.79956
	Equal variances not assumed			8.561	639.505	.000	.65452	.07645	.50440	.80465
Q26	Equal variances assumed	5.491	.019	1.630	3382	.103	.13647	.08374	-.02772	.30066
	Equal variances not assumed			1.677	671.849	.094	.13647	.08136	-.02328	.29622
Q27	Equal variances assumed	37.487	.000	-3.970	3385	.000	-.30481	.07677	-.45533	-.15429
	Equal variances not assumed			-4.302	708.814	.000	-.30481	.07086	-.44392	-.16569

Questions 12, 13 and 26 shows a significant **t**-value difference from the hypothesised mean values (Table 5.3). These questions all show positive values for **t** of 6.7, 8.6 and 1.7 standard deviation units away from the centre of the normal distribution curve, hence it is unlikely that they could have occurred by chance (As an example, Q12 the probability of obtaining a **t**-value of 6.7 or higher, when sampling from the same population with a hypothesised mean in the range of 4.3 to 4.8 is 0.035). Question 27 show a negative value of **t** = -4.3, $p < .05$. The same interpretation can be applied as in the previous questions, except extremeness of the **t**-value is to the left rather than the right of the distribution.

In conclusion, since $p < 0.05$ in all cases we reject the null hypothesis and conclude that is a statistically significant difference. Between both groups. Also, by the magnitude of related t -values, it is concluded that there is a statistically significant effect as to whether you are a current user or non-user on a potential customer to purchase the product under the 4 conditions outlined in Questions 12, 12, 26 and 27. Now that a statistically significant effect has been identified, the next step will calculate the magnitude of that effect.

5.2.1 Eta Squared for One-Way ANOVA

SPSS provides a facility to calculate Eta Squared (η^2) under ‘compare mean – one way ANOVA’ option. SPSS refers to this as “Measures of Association” rather than “effect size”, but is the same calculation.

For Q12 (People who influence my behaviour think that I should use data logging technology in my class) shows $\eta^2 = 0.014$ or 1.4% of all variance is attributed to being a user or non-user;

Q13. People who are important to me think that I should use data logging technology, shows $\eta^2 = 0.023$ or 2.3% of all variance is attributed to being a user or non-user. All effect sizes are summarised in Table 5.4 According to Cohen (1988, pp. 284-7), an interpretation of the effect sizes can interpret as: .01 = small effect, .06 = moderate effect, and .14 = large effect.

Table 5-3 – Effect Sizes

Measures of Association (effect size) * Are you a current user of data acquisition technology products?			
Question	Eta	Eta Squared (η^2)	Cohen’s Scale Effect
Q12	.118	.014	Small
Q13	.151	.023	Large
Q26	.028	.001	Small
Q27	.068	.005	Small

5.2.2 Conclusion

The findings show that there is a statistically significant difference between the group of teachers who are users of data logging and the other group that are not users. Table 5.4 summarises the

findings of the pilot study. Table 5.5 reveals some surprising findings in that Q27 does not suggest that a workshop would have a greater impact on a decision to purchase data-logging equipment for non-users over current users. There is a subtle difference between Q12 and Q13 insofar that ‘people who influence my behaviour’ refers to a person in a managerial role in a school (e.g. the headmaster, or principal), whereas, in Q13 ‘people who are important to me..’ means colleagues for whom there would be a degree of respect. This would account for the differences in effect sizes for similarly directed questions.

Table 5-4 – Summary of findings

Question		Outcome
12	People who influence my behaviour think that I should use data logging technology in my class.	The effect size is small and being a user of data logging equipment has little influence on whether an influential leader suggests the equipment is used in class.
13	People who are important to me think that I should use data logging technology.	The effect size is large, suggesting that colleagues are considered important, are likely to influence the use of data logging equipment.
26	I would be more convinced to purchase data logging if recommended by another teacher.	The effect size is .1%, which is a negligible amount of variance explained by whether teacher convinced to purchase the equipment is a user or not of data logging technologies.
27	I would feel more comfortable buying data logging technology if I attended a workshop conducted by a current or retired teacher.	Only .5% of the variance is explained by a decision to buy equipment after attending a workshop delivered by a boundary agent can be explained by being a user or non-user of data logging

5.3 Main Phase of Research - Qualitative Phase

The qualitative phase will consider the findings of the pilot phase to gain a richer understanding of the mechanisms by which resources that satisfy the conditions of VRIO are created to gain competitive advantage. The exploratory pilot study was exclusively focused on the customer, while the qualitative study was focused solely on the supplier (the thirteen case-study SMEs).

The analysis is presented in two parts. First, a *within-case analysis* of each firm using the abductive TA approach, where the components of the conditions under which VRIO resources are constructed were allowed to emerge from the data (Eisenhardt, 1989).

Second, a *cross-case analysis* applies the emergent conditions of VRIO creation from the first analysis to allow comparisons (similarities and differences) between the 13 case-study firms to ascertain if there are consistent between what the customer and supplier view as important capabilities.

5.3.1 The main themes from the tree nodes

This section will summarise the findings from the semi-structured interviews and will be grouped according to the main themes as they emerged from the data. Appendix E contains a detailed discussion of the tree and daughter nodes. An overarching summary is presented here instead.

In accordance with the TA, the data was first organised by using axial coding using NVivo (v10) and then organised into a thematic structure of tree nodes (for major themes) and daughter nodes (supporting sub-themes in the tree nodes). NVivo allows the researcher to organise data into main headings (tree nodes) and sub-headings within that main heading (daughter nodes). Table 5.5 shows the clusters of tree nodes from the thematic analysis carried out in NVivo. It also shows the number of sources contributing to each tree node (that is, the case-study SMEs) and the number of references made to each tree node across all of the participating SMEs.

Table 5-5 – Tree & daughter node structure.

Tree\Daughter Node	Sources	References
Boundary spanning and KAM activities		
Behaviour of stakeholders	8	45
Boundary agents influences	7	55
Codification of knowledge through boundary agents	7	21
Importance of using teachers to help the promotion of products	15	99
Receptivity to information by the firm	8	21
Attendance at teacher conferences	5	9
Training for teachers	13	40
Using teachers in the firm	8	35
Workshops for teachers	15	62
Knowledge capabilities		
Knowledge codification within the company	14	62
Knowledge integration	8	60
Knowledge sharing	8	49
Methods of Knowledge generation (external)	14	68
Methods of Knowledge generation (internal)	13	54
Prior knowledge	6	17
Tracking ideas	8	21
Localisation of products		
Importance of localisation	13	26

Tree\Daughter Node	Sources	References
Localisation of products	13	26
Marketing capabilities and market positioning		
Regular customer contact (customer focus)	6	39
Strong customer relationships (customer-centricity)	5	27
Direct marketing activities	15	60
Market positioning	15	42
Market segment	12	21
Market share of distributor	8	9
Marketing strategy	3	9
Trade shows and conference activities	5	7
Reconfiguring internal resources		
Ambidexterity in the firm	8	31
Speed of implementation	7	30
Strategy for change management	7	21
VRIO Resource configurations	8	28
Seizing on external opportunities		
Entrepreneurial activity of managers & owners	6	17
Leadership attributes of managers	4	12
Internal processes to seize opportunities	6	13
Sensing capabilities		
Boundary agent roles	8	45
Competitor's activities	12	37
Customer feedback	14	31
Generative sensing	7	17
Sales professional activities (KAM activities)	4	5
Workshop activities for sensing	6	22
Absorptive capacity & competitive advantage factors		
Assistance from Manufacture	10	17
Feedback from the distributor to Manufacturer	8	10
Innovative products suitable for the local market	5	11
Local office support (Technical support)	12	36
Perceived VRIO Factors necessary for CA	13	31
Quality and "fit for purpose" of products	10	31
Skillset within firm	14	75
Value Creation and Capture		
Business model selection	8	18
Core competencies of SME	5	26
Managerial agency and decision making	8	43
Networking and boundary spanning	1	1
Relationship with supplier	8	16
Adding value for the customer (Value creation)	5	26

Tree\Daughter Node	Sources	References
Antecedent resources	8	45
Division of responsibility within the firm	12	25
Educational background of workers	8	20
Interrelationships between workers	4	7
Value capture	7	19
Strategic Alliances	6	16
Technology needs in the firm	10	17

5.3.2 Within-case analysis

Table 5.6 below highlights the case companies that showed the most common associations. This association is measured by Jaccard's index (a measure of similarity of codes between distributors). There are strong associations strong between Ukraine and Turkey (.81), and then between Turkey and Holland (.74). The correlation measure between common words used follows the same Euclidean (linear) pattern, for example, Ukraine and Turkey (.75), then Ukraine and Holland (.71), and finally Turkey and Holland (.71). Table 5.3 summarises the list of participant firms with the highest interrelationships. Jaccard's index thus describes the firms that are most similar in their perception and activities in the market and the relative similarity between the case-study SMEs how they build and develop resources that satisfy the conditions of VRIO.

Table 5-6 – Coefficient analysis of similar country groups

Source A	Source B	Jaccard's coefficient	Pearson correlation coefficient
PC8	PC3	0.82	0.71
PC1 - Ukraine	PC8	0.81	0.75
PC1	PC3	0.74	0.71
PC1	PC7 (2nd Interview)	0.70	0.69
PC7 (2 nd Interview) Slovakia	PC3 Holland	0.69	0.62
PC8 Turkey	PC7 (2nd Interview)	0.69	0.69
PC7 (1 st Interview)	PC3	0.29	0.41
PC8	PC7 (1st Interview)	0.28	0.44
PC7 (2 nd Interview)	PC7 (1st Interview)	0.24	0.43
PC1	PC7 (1st Interview)	0.22	0.39

A more detailed pattern of activities across of the daughter nodes and correlated against each case company is shown in Appendix E. This analysis serves to illustrate the extent of the similarities in the responses collected and analysed by the participants.

5.3.3 Cross-case analysis

This section examines a cross-case analysis of all of the case-study firms. The analysis will examine similarities and differences in the creation of VRIO laden resources for competitive advantage and the mediating influences of knowledge capabilities and the boundary spanning-KAM relationship. The analysis begins with a discussion of each of the RQs and tree nodes and corresponding daughter nodes in turn and focuses on the differences and similarities of approaches between the firms. Phrases that characterise each approach will be described as the discussion continues. Summary of the associations of RQs and tree nodes are captioned in Table 5.7.

Table 5-7 – Research questions and tree nodes.

Research questions	Tree Nodes	No. of daughter nodes
RQ1	Boundary agents & boundary spanning	9
RQ1	Localisation of products	2
RQ1	Seizing on external opportunities	3
RQ1	Sensing capabilities	8
RQ2	Knowledge capabilities	8
RQ2	Marketing capabilities and market positioning	8
RQ2	Reconfiguring internal resources	4
RQ3	Sustained competitive advantage factors	7
RQ3	The firm's VRIO resource configurations	13

5.4 RQ1: How does knowledge integration through customer orientation and boundary spanning influence VRIO resource configurations?

RQ1 focuses attention on knowledge generation and codification mediated through focussed customer boundary-spanning activities. Table 5.9 summarises the analysis of RQ1 with the associated tree and associated daughter nodes.

5.4.1 Tree Node: Boundary Spanning activities

The first tree node to emerge was that of boundary agent activities and their activities in spanning the boundaries between supplier and customer (Figure 5-8).

Table 5-8 – Boundary agents and boundary spanning-tree node

Daughter Node	Tree Node: Boundary agents knowledge generation
1	Codification of knowledge through boundary spanning
2	Importance of using teachers to help the promotion of products
3	Attendance at teacher conferences
4	Training for teachers
5	Using teachers in the firm
6	Workshops for teachers

Daughter Node	Tree Node: Boundary agents knowledge generation
7	Behaviour of stakeholders
8	Receptivity to information by the firm

The findings show that boundary agents (or spanners) are an important element of sales promotion as well as imparting of important information to the firm through its specialist sales professionals. The specialist sales professions, in most cases, are either technically competent in science or were former teachers. Ryal and Davies (2010) recognised the importance of a technical competence in a sales professional when dealing with specialised technical products and the findings support this also. However, the findings of this tree node suggests that boundary agents working outside of the firm have an impact that is influential over prospective purchasers. Ryal and Davies (2010) also profiled different sales professional ‘types’ and found that there is an inherent distrust of specific sales stereotypes. The practise of collecting groups of prospective customers together in a workshop in the familiar surroundings of a school laboratory has important effects on reducing the distance between the firm and customers through the agency of boundary spanners (or agents). For example, PC5 (Germany) also heavily relies on boundary agents as a means of finding out important marketing information and correctly localising the products:

“...They are always feeding me valuable information about competitors and changes that are happening. When we do translations into German of the software programmes there can sometimes be bugs or errors not there in the English version. I cannot check all features on my own, so I rely on these teachers to help...”

Thus, the case of PC5, boundary agents are also important conduits for generative sensing of market condition and actions of competitors. Generative sensing of opportunities, perhaps before your competitors, is recognised as microfoundation of dynamic capabilities. If the firm is able to cultivate a pool of enthusiastic, brand evangelical boundary agents as many of the case study companies have, it is an important resource that satisfies all the conditions of VRIO resources. This is assuming that these resources are properly managed and organised.

The boundary agents that conduct the workshops are often evangelist about the brand and behave much the same way as petrol-heads or science geeks, who go beyond simply conducting the workshops, but actively encouraging the delegates to purchase. Such WOM referrals have been noted by Constantin & Stoenescu, (2014) in their study of Apple products and Matzler et al. (2007) when discussing the VW Golf GTI.

5.4.2 Tree Node: Boundary agents & boundary spanning

This tree node explains the critical market intelligence gathered by the boundary agents assists the case-study SMEs in recognising significant opportunities and thus develops better capabilities to seize opportunities. The findings will draw from eight different daughter nodes, as shown in Table 5.9.

Table 5-9 – Tree nodes associated with boundary-spanning activities.

Daughter Node	Tree Node: Boundary agents & boundary spanning
9	Boundary agents influences.
10	Importance of localisation.
11	The process of localisation of products.
12	Boundary agent roles in resource configurations
13	Competitor’s activities and competitive advantage
14	Customer feedback and customer focus
15	Generative sensing through boundary spanning
16	Sales professional activities – the specialist salesperson
17	Workshop activities for knowledge generation

Most participants acknowledged the important role of using teachers as boundary agents. It was noted from several of the case-study firms that teachers are better sales vehicles to fellow teachers than any of other best technical sales professionals. PC10 credits boundary agents as being pivotal in getting direct access to the Ministry of Education and being instrumental in recommending their products to be standardised across the curriculum of Finland. PC10 acknowledges that this position of competitive advantage would have been impossible without boundary agents and their brand evangelism.

Similarly, PC2 employs no sales professionals, but instead, relies of their extensive network of boundary agents across the Czech Republic. The extent to which boundary agents have embedded the brand in the Czech market can be summarised by P3 as follows:

“...What is very important is if some teacher is to buy [our equipment] or something else they know that if they buy [our equipment] and they have a problem they know the person will ask for help, and now after a few years we develop our market it is also important that there is a really big community of teachers and schools who use [our equipment] so it’s really easy for us to send an email to almost every city in the country, and I can tell them ok next to you is two schools who have this you can go there and try it, talk to these people, and this really works...” (P3)

Having a strong embedded network of boundary agents – as many of the case study companies do – provides a resource external to the firm that is extremely difficult to imitate and replicate. It is not

only the fact that it takes to build a nurture such a network, but the ancillary activities boundary agents can also become engaged.

In all the case-study companies, a small group of boundary agents become heavily involved with the localisation of the products to their local languages and curricula. Although scientific principles are universal, the experimental procedures used in different countries differ widely according to the different curricula. Likewise, certain scientific terminologies have nuanced translations in each different language, so they are not literal translations in many instances. This was identified as a critical element in presenting the product as a genuine localisation instead of competitors who employ a language translation company who do not understand scientific terminologies.

The Ukrainian acknowledged that the firm that had taken the trouble to localise the products correctly have gained a competitive advantage over its rivals and had established a higher level of credibility with the policy makers at the Ministry of Education, and that was reflected in specification in tenders being closely aligned to their products.

SMEs are at a disadvantage against their larger rivals for many reasons. Through a combination of customer feedback and the actions of competitors funnelled through boundary agents, the SME can avail of market information only available otherwise through well-resourced sales team and a marketing team. Mostly, this information is imparted through the workshop activities at which the firm will (in most cases) have a technical sales professional present to answer more technical questions. In the familiar environment of the workshop, customer talk freely with less inhibition. The Turkish company specifically targets these gatherings to cultivate as many boundary agent relationships as possible:

“... our boundary agents and technical salespeople have one been colleagues, or they know each very well. They build strong relationships where they do favours for each other For example.... help each other out with loaning equipment is needed for teaching. When we hold workshops, sometimes the demonstrator [boundary agent] will be their own equipment. That really impresses our customers....”

In summary, Tree-Node #2 has shown that there must be a smooth boundary spanning connection between the firm and the customer. Most of the case-study firms employed technical sales professionals who reported directly to the owners. The technical sales professionals then liaised directly with the boundary agents. It is through this chain that customer feedback is codified and sent back to management in unambiguous way and that customer needs are focused on the right places that add value. However critical market and competitor information is made available directly to firm, so the firm can take corrective actions, or sense and take advantage of an opportunity ahead of its rivals.

5.5 RQ2: How do knowledge generation and KAM managerial actions contribute to the attainment of competitive advantage through the development of VRIO resources?

RQ2 looks at how knowledge is generated, and key account management (KAM) focused procedures, processes, and actions can contribute to the vital VRIO resources associated with a competitive advantage. Fundamentally underpinning this process is the knowledge transfer and assimilation into the SME. Thus, RQ2 investigates to what extent is the customer focused managerial agency also a significant factor. Table 5.10 summarises the four tree nodes and the 19 associated daughter nodes.

Table 5-10 – Tree nodes associated with RQ2.

Daughter Node	Tree Node: Knowledge capabilities
18	Knowledge codification within the company
19	Knowledge integration
20	Knowledge sharing
21	Methods of Knowledge generation (external)
22	Methods of Knowledge generation (internal)
23	Prior knowledge
24	Tracking ideas
	Tree Node: Marketing capabilities and market positioning
25	Regular customer contact
26	Strong customer relationships
27	Market positioning & Market segment
28	Market share of distributor
29	Marketing strategy
	Tree Node: Reconfiguring internal resources for customer value
30	Ambidexterity in the firm
31	Speed of implementation
32	Strategy for change management
33	Unique value-added resources
	Tree Node: Seizing on external opportunities Value capture by the firm
34	Entrepreneurial activity of managers & owners
35	Leadership attributes of managers
36	Internal processes to capture value

5.5.1 Tree Node: Knowledge capabilities

All of the case-study SMEs alluded to the importance of gathering market knowledge as economically and swiftly as possible. These tree nodes consist of seven supporting daughter nodes on knowledge building capabilities, and through which the firm can create and capture value (Table 5.11).

Table 5-11 – Seizing of external opportunities attribute.

Daughter Node	Tree Node: Knowledge capabilities in SME
18	Knowledge codification within company
19	Knowledge integration
20	Knowledge sharing
21	Methods of Knowledge generation (external)
22	Methods of Knowledge generation (internal)
23	Prior knowledge
24	Tracking ideas

The KBV illuminates the importance of knowledge creation and codification in the firm. As part of this study KAM and KBV are intrinsically linked. As shown in the Tree Node 5.4.2 above, the importance of the relationship between the boundary agent and the sales professional has been shown. This Tree Node explored the knowledge capability building in the SME case-study companies. The literature generally regards knowledge gathering and integration as a critical aspect of capability and resource development, which adds value for the customer. External knowledge exists as a potential source for a firm to exercise its absorptive capacity to acquire external knowledge, assimilate it and create new knowledge (Zahra & George, 2002). The boundary agent offers a mediating influence over the transfer of knowledge into the firm. However, the codification of knowledge effectively in the firm depends on the KAM influenced managerial agency. A common factor with all the distributors, regardless of size, is the importance placed on face-to-face meetings. PC3 (Holland), a larger SME, use a central repository for storage of customer, marketing, and product information. However, the effectiveness of key workers' meeting is stressed:

“...It is by meetings together, and then we add important information to the database so that others who are in contact with that customer can see what history is there. When it concerns information and knowledge that might be important for opportunities that are then discussed in meetings, we would sometimes call especially. All of us will have an input, so from engineering, programming, financial and marketing to decide what to do. I suppose this is down to the individual manager. A good example is your visit here and the strategy discussions we will have later. All of our team will be there to see first-hand what you are saying...”

An interesting aspect of the findings from this node is that it brings together the importance of boundary spanning combining and building knowledge within the firm. PC5 uses an extensive network of customers with boundary agent and arranges conferences for them to meet. The knowledge gathered is in a sequential way that strongly influences their marketing plan in Germany. PC5 has managed, with the aid of boundary agents, to build a close and personal relationship with its customers in an extremely large market such as Germany.

Most of the case-companies stress the importance of building in tacit knowledge to develop the important VRIO resources. PC8 and PC1 use this to good effect through internal meetings with boundary agents often present when major decisions are being made. However, possessing the capability to have prior knowledge of impending large contracts through boundary agents that are well connected, is a resource that is greatly valued by PC8. In countries where corruption is high, being able to make have a boundary agent that can make representation the firm’s behalf if a contract is suspected to have been awarded through corruption, is a resource not many SMEs could ever possess.

The importance of such a resource was explained by P12 in his native Slovakia. P12 explained how a much larger rival has secured a national contract through corrupt practices, and how his firm (consisting of only 3 employees) was able to make successful representations at the highest levels of government and succeed to overturn the award in their favour. The high-standing of the boundary agent was pivotal in the success challenge and was an example of how P12’s firm was able to attach their reputation to that of the boundary agent and succeed against a much larger rival. The ability to leverage a resource such as a well-connected boundary agent is sufficient alone to confer a competitive advantage. Since the contract in question was to supply all of the schools in Slovakia, the resource led to a sustainable competitive advantage.

5.5.2 Tree-Node: Marketing capabilities and market positioning

Allied to the quality and fit for purpose is the marketing and market positioning of the product in each localised market. The questions addressed the specific market segments targeted by each distributor and the relative importance placed on the development of marketing capabilities and the correct market positioning. Also, the market positioning of the product was discussed as this was of critical importance as to the supporting important VRIO resources. The perceived market share enjoyed by each distributor was also discussed as this could provide a benchmark as to their relative success in their local markets and the extent to which the dynamic capabilities underpin and develop market share (Table 5.13).

Table 5-12 - Marketing & market positioning attribute.

Daughter Node	Marketing capabilities and market positioning
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25	Regular customer contact
26	Strong customer relationships
27	Market positioning & Market segment
28	Market share of distributor
29	Marketing strategy

The SME firms in this study do not possess the marketing budgets or personnel of the large rivals. The findings showed that the case-study firms who actively involved boundary agents in the marketing plans showed a higher year on year growth than those that only relied on traditional means. As shown earlier, PC5 from Germany relied heavily on their network of boundary agents to help to market their products. German teachers are not easy to contact and have an inherent distrust of sales professionals in the science equipment market. Hence, developing a large network of boundary agents was critical for a successful market penetration. In short, without boundary agents actively promoting the brand as evangelists, it is extremely difficult to succeed in the German market.

5.5.3 Tree Node: Reconfiguring internal resources.

The daughter nodes “Reconfiguring internal resources” tree node is shown in Table 5.13 as follows.

Table 5-13 – Reconfiguring resources attributes

Daughter Nodes	Reconfiguring internal resources
30	Ambidexterity in the firm
31	Speed of implementation
32	Strategy for change management
33	Unique VRIO Resources

All of the interviewees confirmed the need for the firm to be flexible enough to maintain its market share while simultaneously sensing and seizing new opportunities. All of the dealers recognised that they have to be vigilant at all times and be aware of changes in technology and to curriculum designs. However, all distributors reiterated their reliance on the manufacturer to develop new and pertinent technologies, so the case-study firms are free to concentrate on the changes necessary in their capabilities. The ambidexterity of the case-study firms is facilitated through their close partnership with the close relationship between the manufacturer and its distributors.

The need to be able to exploit new markets outside of their traditional industrial market was alluded to by PC6 (Iceland) who “... have a strong technical base in our [their] company...” The CEO acknowledges the new organisational resources needed to move from Industrial to Educational markets:

“...I feel confident that we have the ability to transfer that to schools as well. If we can get some of the teachers on board, and the technical support we can back them up with, will be a strong value offering to the teachers of Iceland. It gives us a significant advantage because our main competitor is just a general office supplier that supplies everything and anything...” (P9)

Ambidexterity in SMEs is considered to be an important factor in recognising new opportunities while simultaneously maintaining a competitive edge in their day-to-day businesses. None of the participant firms consciously sought out to plan for new opportunities, with the exception of PC3 (Holland) who was by far the largest of the case-study firms. In fact, the size of the company only just qualified them in the SME category. In the case of PC3, they are open planned and sought new opportunities through company acquisitions, joint ventures and recruitment of highly skilled workers. Ambidexterity in the remaining firms was influenced through opportunism mediated through knowledge gained by bounding spanning activities. Ambidextrous practices were seen as being risk-laden, and often opportunities were not considered if they were too far from their target markets. Whereas PC3 had the financial resources to diversify away from their core markets, the smaller case study firms were able to maintain a competitive advantage in their niche markets.

While ambidextrous practices in larger organisations are regarded in the literature as being a key determinant in attaining competitive advantage (Jurksiene, Pundziene, Svensson, & Pehrsson, 2016; Kowalczyk & Buxmann, 2015; Kumar, 2012; O’Reilly & Tushman, 2008), the findings of this study suggest that is not necessarily the cases in SMEs. However, speed and agility, when necessary, can make a significant difference, as commented on by P19 from Croatia. There is no doubt that the Croatian firm continued to build more innovations from the initial one to maintain an edge in value-added customer focus.

During interviews with other case study firms, there were numerous examples of small stepped innovative changes made to the products and customer service. All of the case study firms acknowledged that valuable information was shared at international dealers’ meetings, so value-added activities that had been successful in some markets were transposed to other markets. For example, the UK offered free live training webinars to all teachers, whether customers or not, that was then implemented in other markets. Other measures included marketing promotions that included free sensors, exchange of competitors’ equipment as a trade-in against the Genisys brand, and the creation and delivery of a free quarterly science magazine to all customers and non-customers.

Change management is not only confined to management and leadership, but to the necessary tweaking of practical value-added activities that contribute to the attainment of competitive advantage. In comparison, all of the participants recognised that the managerial structure and culture must have congruity with the resources and capabilities required for change. Particularly, in the case

of PC3 (Holland), PC8 (Turkey), PC12 (Croatia) and PC1 (Ukraine), the managers emphasised that the minimalist managerial structure was such that decisions are made quickly to support innovative change, firm agility and VRIO resource building.

5.5.3.1 Daughter node 33: VRIO processes.

SMEs who have to compete with much larger rivals need processes that are unique and offer added value to their selling proposition in a cost-effective way

Added value is seen by P18 (Poland) as being pivotal and a key signature process by providing free training on the equipment even before purchase:

“...I also offer training even at the beginning [before they buy] to convince them that they will not be by themselves after buying the product, so they know that the training is possible.” (P18).

All respondents except for Iceland and UK use workshops as an important element of their product promotion. Czech offers a free sensor to schools that attend the workshops, creating a higher value in the mind of the customer. PC7 (Slovakia) uses a pedagogical-based approach to the promotion of data logging that has thrived over many years and built a higher level of trust:

“...Our customers have learned to trust in our company. This is because of the way we communicate with them. That means we talk to them as equals.....we talk about the pedagogical advantages instead. This is the first step in making the sales to the school. You need to convince them that the product is useful and that is not as difficult to use as they imagine...” (P12).

All the respondents were implicit in their belief that a strong customer focus and only putting their most technically salespersons when selling technical products in direct contact with customers was critically important. As P18(Poland) put it: “... there is little point in building resources and capabilities over many years if you then sent out a “..bałwański..” [idiot] to meet the teachers..” As has been discussed in the previous discussions, development of VRIO resources is hugely relational and depends much more than slick company practices. What is essential is that the VRIO processes are carried through and are consistent right up to the customer interface with the teacher.

The foregoing discussions have highlighted the importance of workshops in gathering information mediated using boundary-spanning activities. Again, all of the firms were careful to select their technically competent salespeople to attend the workshops. This is because, on occasion, the boundary agent may run into a technical issue and required the assistance of the firm’s salesperson to assist and allow the workshop to continue. All of the case study firms were aware of the fact that their firm had to appear as they were as knowledgeable as the boundary agent.

5.5.4 Tree-Node: Seizing on external opportunities.

This tree node builds around the ability of the firm to sense and then seize opportunities quickly, and proficiently as a key dynamic capability, according to Teece (2000). The ability to take the opportunity is equally important regardless of the firm's size. The literature on dynamic capabilities is an adjunct to the RBV Theory that informs and guides this study. The seizing of opportunity required that specific VRIO resources and capabilities are deployed in the most agile manner possible. This involves certain novelties that are intrinsic to the causal ambiguity that is difficult for rivals to disaggregate and hence imitate. Due to the highly confidential nature of some of the specific processes put in place by the case-study firms, requests of utmost confidentiality have been respected, and the following discussion in this daughter node will proceed through a generalised summary.

Table 5-14 – Seizing of external opportunities attribute.

Daughter Node	Seizing on external opportunities
34	Entrepreneurial activity of managers & owners
35	Leadership attributes of managers
36	Internal processes to seize opportunities

While static routines (such as operational routines) are extremely useful in the firm and can be a source of sustainable competitive advantage, for a while at least, it is the dynamic capabilities that underpin the competitive advantages at the enterprise and entrepreneurial levels (Teece, 2009). Dynamic capability theory is concerned with markets that are in a state of 'high-velocity' change. The dynamic capability is deficient in what it means by a "high-velocity" change and when does a "high-velocity" change stop and revert to a 'normal' level of growth. Additionally, markets can move from a normal change level to a high-velocity level and then back again to some state in-between. Although a discussion involving the dynamic capability paradigm is necessary, it is grounded through the lens of the RBV.

Thus, reflecting the consensus in the literature, the entrepreneurial, managerial agency from both perspectives (that is, DC and RBV theories) is confirmed by PC12's (Croatia) view on the importance of inspired entrepreneurial change:

"...For daily activities, yes we are encouraged to be our own businesspeople [entrepreneurial] as much as we can. I get more confidence as time goes by..... it is good to have an open relationship with P19 [CEO]....we work together well..."

The importance of promptly seizing an opportunity was described by P3 (GM) of PC3 (Holland), which has led to a significant strategic opportunity:

“... Our decision to take over the market in Holland was from an informal discussion in a bar after the distributors meeting in Cambridge..... It was clear that a key man was unhappy with the recent takeover.....so we seized on that possibility.....and now we will shortly become the distributor in the Netherlands as well as Germany.... but of course...we had to move swiftly to achieve this situation.so, we have a much bigger opportunity in our lap...once more we embraced this possibility, and it will be very good for us...suddenly we have a new market presence in all of the science supplies markets...”

PC8 is unique amongst the case-study firms in that they are also manufacturers of more traditional physics teaching equipment. The CEO of PC8 (Turkey) released that by integrating the data-logging technologies, the firm could substantially increase its market scale and scope. Thus, in one example of seizing an opportunity, the firm was able to commence with the creation of a new set of VRIO resources and capabilities that would allow them to gain a competitive advantage through a seamless configuration of the old and new technologies offering a hitherto products not available before. Since many teachers struggle with integrating new technologies into their teaching of experiments, PC8 delivered the solution in a single product. PC8’s CEO admitted that if it had not been for input from boundary agents and prior VRIO resources, the idea of combining both sets of equipment would not have happened.

The importance of competent managers is emphasised by Ambrosini & Bowman (2009) for showing leadership in the reconfiguration of processes necessary by leverage existing resources. The importance of competence is reiterated by PC8 (Turkey):

“...Without the specific product managers and sales managers, any new ideas cannot get put into action. These are important positions for our company because we generally employ people here that are at least graduates in some science subject. It is better if they have been a science teacher themselves because they can understand better what feedback comes from the customers...”
(P14).

Not only does the competent leader build last relationships with boundary agents, but are able to make sensible and rational decisions when presented with important market knowledge.

All distributors report that an internal meeting is the most effective and efficient method to discuss potential opportunities and formulate plans to seize them. The smaller SMEs depend on their agility and flexibility in reconfiguring resources and their strong customer relationships. The CEO of PC9 (Belgium) reiterates:

“...Our Company is very much like an all-in-one printer; we are a small group we can have formal discussions and small meetings to point out new developments in the market....”

The larger distributor employs a more structured approach. In a similar vein, they accord the need to be agile and flexible as the most decisive factors is seizing opportunities. The technical and entrepreneurial competencies of the key managers are also emphasised as pivotal. Where public procurement contracts are susceptible to corruption, the SME relies heavily on their boundary agent contacts to help open channels of discussion to ensure that the tender process is transparent and fair:

“...We always try through official channels first. You have to be careful because you cannot interfere with the tender process because you..... could get disqualified. This is where a close relationship is so important..... with ministry officials. Our competitor has that relationship, and we are jealous because we do not. Our competitor is also jealous of us because of our relationship with teachers [customers]...” (CEO, PC2).

In summary, the requirement for flexibility and agility in the case-study companies are emphasised as an integral part of reconfiguring important resources so that they can add value to the customers. The tree node also demonstrated the relational aspect of decision making the openness to boundary spanning ideas. The Turkish SME mostly employs former science teachers who are looking for a change in career while still utilising their skills because they have found that they are extremely effective working with boundary agents.

5.6 RQ3: Where is the value created and captured by the firm?

RQ3 presents the findings from the final group of daughter nodes whose common theme was the delineation of the SME’s VRIO resources and (where applicable) dynamic capabilities that were perceived as being that which contribute towards the building of VRIO resources and capabilities necessary for competitive advantage (Table 5.16).

5.6.1 Tree-Node: The firm's VRIO resources

This Tree-node table exemplifies the sources of the creation of the VRIO resources. As would be expected, the methods through which KM and KAM source and disseminate the knowledge to build VRIO resources is part of a highly relational system (Table 5.15).

Table 5-15- Foundations of VRIO attributes.

Daughter Nodes	Tree Node: The firm's VRIO resources
33	Business model selection
34	Strategic VRIO configurations
35	Managerial Agency
36	Networking skills
37	Relationship with supplier
38	Adding value for the customer
39	Antecedents
40	Division of responsibility within firm
41	Educational background of workers

5.6.1.1 Daughter node 37: Business model selection.

The findings show that the case-study companies' primary focus is on the customers, and to a lesser extent on their competitors. The approach to the market by the different distributors shares remarkable similarities.

The case study firms chose the business model that was most appropriate to their needs. In all but Germany, the firms had a direct relationship with the schools and teachers. Thus, their approach was a direct relationship with the end-user. Reflecting the more traditional approach of business in Germany, the dealer adopted a model that is based on selling through specialist re-sellers. The re-sellers then developed the relationship with the schools and teachers. The rationale was that Germany was too big geographically and in economic terms that regionally located re-sellers (or sub-dealers) reflect the most efficient route to market. Germany, being a Federal State, operates different curricula in each of the Federal regions. Therefore, it is impossible for a centrally located SME to adequately engage with each different Federal State. In order to develop the resources and capabilities to enjoy a competitive advantage, the VRIO resources necessary to support, market, localise and offer training is resident in the case-study firm (the dealer for Germany). The necessary VRIO resources are then developed individually by each of the sub-dealers to address the specific needs of the different Federal States. Therefore, unexpectedly, the VRIO resources are shared and combined between dealer and sub-dealer to ensure that a valued-added customer focus is maintained. The model has confirmed that the brand of equipment is securely embedded with the curriculum of each of the Federal States, so that transference to another supplier's brand is all but impossible, while that particular curriculum remains in place. In short, the firm enjoys a competitive advantage with the return of value from the customer in the form of superior profits and assurance of continued sales in the immediate future.

For smaller SMEs to effectively compete with their much larger rivals, the findings show that they need to possess VRIO resources (and possibly, unique dynamic capabilities) that are not easily imitated by competitors. The relationship is key, according to PC8's (Turkey) P14:

“...The relationship with our customers is always first in our minds. If we act correctly through support and delivering good products, we bond with them, and they help us to keep delivering the correct service that keeps us ahead of our competitors...”

PC3 (Holland) also emphasise relationship building, value-adding and competency development

PC9 (Belgium) regard a rapid technical response to any customer related problems as of pivotal importance and an important resource that teachers value highly.

Leveraging their network of contacts is emphasised by PC2 (Czech Rep):

“...Yes, I think it helps us that we sit on the Department of Physics Education Board, and I think Competitor A is jealous of this. What is very important is if some teacher is to buy our equipment...and they have a problem they know the person will ask for help, and now after a few years we develop our market it is also important that there be a really big community of teachers and schools who use our equipment so it is really easy for us to send an email to almost every city in the country and I can tell them that next to you is two schools who have this - you can go there and try it, talk to these people and this really works...”. (P2).

A common goal, although not achieved by all participants, was a strategy that embedded their products into the local curriculum. What that means is that, if the science curriculum is devised such that the procedures are similar to the methods used to gather data by a particular product, then that is the only method many teachers are likely to follow. The reasons are three-fold: (i) purely for reasons of convenience, (ii) the final State examinations will likely use questions based on that method, and (iii) the textbook publishers will only use the same methods.

Of the case-study companies, 12 singled out the need to be embedded in the curriculum standards. Once that has been achieved, the textbook publishers will only write their materials around the methods adopted by that particular manufacturer. Since textbooks are ubiquitous with teachers and students, the scale and scope of the reach are greatly magnified. Moreover, it is not uncommon for the publishers to request images of the products showing them in operation to be used extensively throughout the textbook. The textbook publishers commission teachers to write the materials for them. As the Slovakian and Czech dealers pointed out earlier, these teachers are prime targets to be employed as boundary agents because of their networks and influence.

Managers (or key individuals) represent a primary source of advantage if they offer superior skills that do not present in competing firms. The literature recognises that it is these skills and resources that confer the ability of the firm to outperform its competitors (Day, 1994). The findings show that the role of managers is considered critical in seizing opportunities quickly.

Relationship with the supplier is shown to be of central importance to have a sense of security and to be prepared to invest in the brand locally. All of the distributors alluded to this important relationship feeling part of a global “family”. The desire for a continued and closer relationship was evident in the interview findings.

5.6.2 Tree Node: Absorptive capacity & competitive advantage factors

This section will examine the findings from the tree node of absorptive capacity & competitive advantage factors (Table 5.16 below). The previous discussion has discussed the utility for strategic alliances (supplier, boundary agents, and commercial partners) to develop absorptive knowledge capabilities. The inter-connections of factors of competitive advantage perceived by the case study respondents will now be discussed.

Table 5-16 – Competitive advantage factors tree node.

Daughter Node	Absorptive capacity & competitive advantage factors
46	Assistance from Genisys
47	Feedback from the distributor to Genisys
48	Innovative products suitable for the local market
49	Local office support
50	Perceived Factors necessary for Competitive Advantage
51	Quality and “fit for purpose” of products
52	Tacit skills sets within the firm

All distributors cited assistance in terms of marketing materials, technical support, prompt deliveries and advance notice of new product developments as being the key issues in the development of their absorptive capabilities. A closer working relationship between supplier and distributor is emphasised by PC1 (Ukraine).

Regular dialogue and communication with the manufacturer are stressed by all case-SMEs. In particular, PC13 (Estonia) regular feedback received from boundary agents about new product ideas and modifications to existing products. The CEO criticised the supplier for not taking suggestions more seriously for localisation and not assisting more in developing a joint marketing approach. The CEO of PC12 (Croatia) however, espouses the close relationship with the supplier and shared experiences can help with his firm’s absorptive capabilities:

“.... This also builds our strength because it shows that a big company is also our close partner. We are really delighted when Genisys sends someone who has been a teacher before because they can share experiences in other countries. This is really important...” (P23).

Innovation and the first to make new unique products are cited amongst the strongest factors for competitive advantage. The GM of PC3 (Holland) explains why innovation is important:

“...It is always useful. If you have something that is innovative or new, the salespeople love to go to customers and show them these new cool products. It is like refreshing the salespeople. It is also good for the company because it gives us a head start on the competitors.....the new sensors.... allow us to take advantage of the iPads and Android tablets in schools and start to generate a new market even though the school may already have a competitor's products. Yes, it is important...” (P4).

The support of a competent local office is regarded as a key area to absorptive capabilities, which lead to the development of important dynamic capabilities underpinned by VRIO resources. The security for the customer is that there is a local language specialist to assist in matters of technical and quality issues. After-sales service and training are a necessity to establish a good reputation with customers:

“...Yes [training] is definitely added value. The fact that we offer training support with it as well which is far better training support than anybody else out there, I think that really helps as well...that is the feedback that we get back. They are looking for a solution that is going to work every time, and they get backup from people who know what they are talking about...” (CEO, PC4)

In addition, the advantage of local office support also extends to the localisation of pedagogical material, and all distributors as important sources of competitive advantage see the translation of software.

This was an area of rich discussion with all distributors expressing specific factors for their regions. All respondents acknowledged that the firm must have highly developed knowledge absorptive capabilities. Without these capabilities (that must, in the main, be VRIO), a competitive advantage against larger rivals becomes a difficult task. The factors deemed necessary for competitive advantage are arranged in two groups in Table 5.18 (below). The first group describes the factors common to all case companies, while the second group refers to specific factors for each region. The discussion contained references to product quality and fit for purpose, which is outside of the focus of this research but is worthy of a mention.

Eight of the case-SMEs referred to the need to develop absorptive knowledge capabilities that were difficult to imitate by rivals. Examples are given included holding specialised webinars, specialised workshops and partnerships in EU projects and with textbook publishers. The CEO (P14) of PC2 (Czech) cites their ability to produce and demonstrate novelty experiments as a means to generate feedback from customers regarded as being a particular VRIO absorptive capability.

Table 5.18 acts as a concise summary of the discussion of the preceding nodes 42-46. As the summary it shows the factors considered necessary that confer a position of competitive advantage are many and varied. The general factors are outlined, in no particular order, as they were all considered to be critical to one degree or another. The VRIO factors are then representative of some collection of various individual factors. The VRIO factors listed in Table 5.18 are not individual and distinct, and general aggregate factors to become VRIO resources. Hence, the general factors on their own are unstable and not sufficient (in most instances) to allow competitive advantage to occur.

Table 5.18 thus summarises the important value-added activities carried out by the case-study firms. The individual factor varies from ensuring that the products are of a high enough quality, and they perform the tasks necessary to the local curriculum needs. This is further reinforced by the local supplier's efforts to make sure that the front-end software is translated into the local language, and moreover, that the technical terminology is accurate. Such an important factor of translation ensured that there is consistency between the curriculum textbooks and the data logger device. The firms all worked hard at building a solid reputation based not only on product localisations but on customer-centric engagement and support wherever it was needed. The combination of these factors appears to the customer that an imported product to be a local product. Only firms that can entirely focus their efforts on a niche market can create a VRIO resource that is hard to imitate.

Encouraging customers to form groups geographically dispersed around the country helped the firm also establish a broad group of boundary spanners. The effect is to create an extension of the firm's technical sales and support staff, providing a resource that is rare compared to the larger rivals.

Strategic alignments with complimentary suppliers, such as textbook publishers, is one of the several instances where sustained competitive advantage can be achieved. In aligning with publishers and supporting their written materials, the brand becomes associated through illustrations in the textbooks of experiments being conducted with a particular brand. Teachers, therefore, consider the brand as the one that is recommended by the government and hence purchase it over other alternatives.

The associated VRIO factors that are developed, such as the building of relational competencies and capabilities, originate quite often in the form of important knowledge gained through boundary-spanning. The developed boundary spanning, KM and KAM skills of the firm, create the resources that particularly valued by the customer. However, this is an iterative process and one that is not always perfected immediately. As Table 5.17, the generation and/or reconfiguration of VRIO resources are dependent on many factors that are all highly relational.

Table 5-17 – Factors of competitive advantage

	Individual Factors.	VRIO Factors.
INDIVIDUAL FACTORS COMMON IN CASE STUDY FORMS	Quality products (fit for purpose).	
	Boundary spanning activities.	
	Excellent customer support and training.	
	Firm reputation.	• Boundary agent and spanning activities.
	Localisation of pedagogical materials.	• Antecedent factors which include firm reputation and signature processes.
	Localisation of products.	• The localisation of products and curriculum adoption.
	Embedding in local curriculum.	• Customer-focused philosophy and credible technical sales staff.
	Frequent newsletters with helpful information.	• Relational competence building and inclusion.
	Strategic partnerships (e.g., Textbook Publishers).	• Managerial agency in facilitating change rapidly.
	High-quality education support materials.	• Integration of KM capabilities with a dynamic KAM approach.
	Innovative products.	• Regular and close contact with the customer through practitioner-focused workshops and newsletters laden with useful teaching hints and tips.
	Local office and technical support.	• Strategic alliances with textbook publishers.
	Exclusivity of the commercial relationship with the supplier.	
	The relationship between supplier and distributor built on trust.	
	Knowledge exchanges with fellow dealers.	
	Networking – locally and internationally.	
	Flexibility and ease of use of technology.	
	Knowledge codification and knowledge sharing	
	Competitive pricing.	
	USD currency fluctuations.	

Absorptive capabilities confer on the firm the ability to listen to what the customers are telling them; good or bad. The CEO of PC4 (UK) stressed the importance of the firm’s reputation to listen and hence to give the customer what they need in that cost is not the determinant in the decision to purchase data-logging, but more to the quality and reputation of the firm.

All the case companies agree that technical competence and marketing knowledge capabilities are necessary antecedents gathered through absorptive capabilities. All the case-companies regarded a high level and quality of customer care and contact as being of pivotal importance because of the technical nature of the product.

The advantages of being a former physics teacher help with the development of absorptive capabilities honed through many years of relationship-building is recognised by the CEO of PC10 (Finland):

“...I have teachers from middle schools so that I can discuss with them things about the market and things like that. They are not in the company, but I use them for workshops...the benefit of my background is clear in sales communication with teachers. I have the first-hand experience of many products and can tell how they can be used most efficiently in classroom...”

In summary, the key skill attributes for the development of VRIO resources is a well-developed absorptive capability in the firm. To achieve this, important inputs are needed from a variety of different areas. While boundary spanning activities are widely recognised as a means by which SMEs can compete with the larger marketing departments of their much larger rivals, there is a strong emphasis placed on good relations with Genisys. Many of the SMEs were able to present themselves as appearing to larger than they are through projecting themselves as an extension of Genisys. Through localising the products and employment of former science teachers to be interface with the customer, they maximise effectiveness of the boundary agent. The customer therefore sees a seamless link between a trusted boundary agent and a product that is designed and manufactured in the United States. The literature discussed the impact of brand evangelists, mostly in the context of petrol-heads and tekkies, and the positive impact they can have on sales through WOM. Several of the case companies referred after the formal interviews about how discussions can often break out in workshops and how some customers can convince others to purchase Genisys ahead of other possible brands.

5.6.3 Tree node: Foundations of Competitive Advantage

This tree node examines differences and similarities between each of the case companies in the creation of the foundations of competitive advantage through resources and capabilities considered to satisfy the conditions of VRIO in the case-study firms were not exclusive to one particular area within the business but pervade many different areas building on capabilities elsewhere and were influential in the development of competitive advantage. Accordingly, the division of responsibilities within the firm provided unique insights into the mechanism whereby the small firm must build and reconfigure its VRIO resources and capabilities (Table 5.18).

Table 5-18- Foundations of Competitive Advantage

Daughter Node	Foundations of Competitive Advantage
48	Adding value for the customer
49	Antecedents
50	Asset and resource orchestration
51	Division of responsibility in the firm
52	Educational background of the workers
53	Interrelationships between workers
54	Path dependency
55	Strategic alliances

All of the case firms recognised the need for added value as a key success factor in their ability to exploit opportunities. The central theme was clearly established that added value must be seen by the customer as such. P4 of PC3 (Holland) suggests that internal knowledge and technical capabilities underpin their value-added proposition for the customer.

Utilising the expertise of their boundary spanning activities, the Dutch dealer recognised that teachers were being asked to teach STEM subjects without any curriculum to guide them or any training from the government. Due to their countrywide activities in workshops, rumours of the impending introduction of STEM based activities in the Dutch secondary schools reached PC3 before their competitors. The added problem of the introduction of an inquiry-based learning pedagogy was obviously going to be a significant challenge for Dutch teachers, according to the feedback from boundary agents. Understandably, a stressful situation for teachers, and one that PC3 was able to fully understand and empathise with given that its entire salesforce is composed of former headteachers. PC3, although was an established supplier of educational equipment in Holland – mostly kindergarten – the opportunity to provide a free textbook to help and guide stressed customers (and potential teachers) quickly propelled them towards a strong position in the market. PC3 admitted that it was with the help of boundary agents that this rapid response was possible. This is an example of signature processes, where PC3 takes on the role of educator to fill a void that should be occupied by the Government. It is also an example of utilising and organising the important resources that have been meticulously been build and refined throughout the years, such that they could not be easily imitated, substituted or procured on factor markets by their rivals. Accordingly, it is an example of how VRIO resources can lead to competitive advantage.

VRIO resources are exploited by PC6 (Iceland) in another way. PC6 view competent technical support as being of significant added value. P9, the CEO believed that a holistic approach to sales in a small market such as Iceland is vital. The firm has a strong foundation in datalogging capabilities

at the extreme end industrial market segment. Accordingly, in the rather unique conditions in Iceland, PC6 is competent to help teachers to tackle environment experiments necessary for the Icelandic market, often by making modifications to standard products. It is a customer added-value service their rivals cannot offer, since they lack the technical capabilities.

The technical competence of the firm allows them to offer and solve technical problems that are not directly related to the specific products they are selling. A particular example given was where the data-logging software required was installed on the school's computer server, a technical task that is not straightforward given the complications in assigning IP addresses to each data logging device:

“...It is very important. You have to give the service that is required...the customer needs technical help; then you must give it... This is the case in our industrial division where all the products are technical... It gives us a significant advantage because our main competitor is just a general office supplier that supplies everything and anything. Therefore, they have no technical ability, so if a school researches themselves a product they carry, that is the only way that sale will be made...” (P9).

Customer service is recognised by PC7 (Slovakia) as a significant added value by the customer when competitors do not offer an equal level of value. The CEO was forceful in his belief that adequate, value-added support in the form of training for the life of the product has to be made available. The simple maxim is that customers must be confident in using the equipment because it will be used, and other potential customers will see that and be inspired. The importance of having former teachers on the sales force is exemplified by all of the case-study companies.

PC1 (Ukraine) were quick to recognise that their home market was not the most sophisticated in terms of technology in school, so it needed a specific approach. This involved making a copy of the supplier's website, thus giving the initial impression that the products are established in Ukraine. The manufacturer based in the USA is synonymous with an unrivalled level of teacher support; therefore, it was necessary for the local dealer to mimic the same in Ukraine. It was a level of service never before experienced in the education industry.

“...The value added is put on the product in the form of support [technical and pedagogical] to the teacher. We have tried to make a copy of the Genisys website in Ukrainian, where we have put all the training videos with subtitles on there also. It is important..... for customers to know we are able to help them. We really take the American product and make into a Ukrainian version...” (P1)

Underpinning this immense effort has been carefully selected, boundary agents and internal specialist salespeople. However, the success of their endeavours are predicated on the history and

track record of the firm. As discussed in the literature, signature processes do not suddenly appear but are the result of clever Asset and resource orchestration that are embedded in antecedent factors.

The case companies all have a strong tradition in the education market, except for PC6 (Iceland) and PC4 (UK). The smaller SMEs have established their businesses on a network of contacts established from their previous careers as educators. The larger SMEs are a second or third generation of ownership and still retain their focus on the education market. Both groups of distributors have established warehousing and distribution facilities, repair facilities, pedagogical capabilities, localisation resources and workshop/training competencies (summarised in Table 5.19).

Table 5-19 – Summary of antecedents in case companies

Case SME	Location	Employees	Use boundary agents	Science degree(s) holders in the firm	Generation of ownership	Product range
PC1	UKR	30	Yes	5	1st	Mixed
PC2	CZE	5	Yes	5	1st	Science only
PC3	NLD	54	Yes	1	3rd	Mixed
PC4	GBR	8	No	0	1st	Mixed
PC5	DEU	18	Yes	3	2nd	Science only
PC6	ISL	12	No	0	2nd	Mixed
PC 7	SVK	3	Yes	2	1st	Science only
PC8	TUR	48	Yes	12	2nd	Science only
PC 9	BEL	14	Yes	3	2nd	Science only
PC10	FIN	3	Yes	2	1st	Science only
PC11	POL	2	Yes	0	1st	Science only
PC12	HRV	12	Yes	0	1st	Mixed
PC13	EST	10	Yes	2	1st	Science only

All case companies emphasised the need to have flexible workers able to multitask to enable the firm to remain agile in the face of competition.

The importance of organising limited resources in SMEs to maximise their collective impact is explained by CEO PC1 (Ukraine) as asset orchestration in the firm:

“...The pedagogical managers can sometimes take a sales role. They can go to school and perform workshops.....but they are really selling! They can also build relationships with customers and ministry workers. This is also the job for the sales manager.....but she has to cover all of Ukraine.....so she must sometimes concentrate on larger projects.....this can be computer systems for a school or district. This takes time, so...for the more technical products, the pedagogical workers [who were former teachers] are happy to help.....they are still secret teachers.”(P1).

When the competencies do not exist in the firm, the option is to buy a smaller rival and integrate those capabilities with the new firm, according to the GM of PC3 (Holland)

A similar approach is adopted in Turkey by PC8, except instead of purchasing a company their strategy to develop their own capabilities by employing more boundary agents with the specific skills they are lacking. PC8 also explains that the development of assets that can lead to a competitive advantage is a focus of the firm all the time. PC8 is also a manufacturer of university grade physics teaching apparatus, and leverage wherever possible, competencies between their engineering and sales staff. If PC8 develops a new product it is only sanctioned after discussion with boundary agents. This allows PC8 to have their products tested in laboratory conditions and any modifications suggested will lead to a product ideally suited to the purpose for which it was designed. In science teaching, this is an extremely important product attribute for teachers.

As discussed in Section 3.11 above, asset orchestration can be an important capability for a firm that has to compete in a highly competitive market. Garvin (1988) (Section 3.1.1) refers to the competitive leverage that can be gained if a firm can link its customers experiences with product design choices by the firm – particularly so if products are complex and require engineering design configurations. Both Garvin (1988) and Zahra & Nielsen (2002) agree that a combination of internal and external resources can be extremely effective in producing a product that brings value to the customer. When comparing with what PC8 emphasised, there is congruence between the literature and the findings.

It is one thing to have feedback from evangelic customers, boundary agents or ‘geeky’ customers, it is quite another to make the strategically correct decisions to asset orchestration. Throughout the findings a general theme has been the requirement for employee flexibility. Teece (2009). Returning to PC8, the firm has sought to develop a flexible workforce where responsibility is divided in a way that there is co-specialisation wherever possible. This means having product engineers attend workshops to demonstrate the products with the boundary agents, allowing them to hear first-hand if modifications are required. This synergistic approach to complimentary assets is recognised by Teece (2009) as a basis of competitive advantage.

Building on previous findings, SMEs require a flexible workforce. Therefore, it was not unexpected that the findings would emphasise the need for the firm to continue to build and re-configure capabilities in the firm. The need for specialised employees such as software engineers to also assist in sales functions was referenced by the P9 of PC6 (Iceland):

“...We have 12 persons working here. They are split between engineers and programmers mostly. So, they would have a technical educational background. We then have a marketing manager and a sales manager. They would all be technical in some respect...”

In 12 of the 13 dealers, employees who were in contact with customers possessed a university degree in some scientific discipline. The smaller SMEs relied heavily on a small number of employees with higher degrees and appeared to be more specialised in specific areas of science. The larger SMEs employed graduates with teaching backgrounds, but not necessarily from science backgrounds. Where there existed a gap in the firm's competencies in science, boundary agents were more frequently used. For example, PC12's CEO (Croatia) explained his firm's reliance on boundary agents:

"...I was a secondary school maths and economics teacher, so all my contacts and my understanding of the teachers and the curriculum is here..." (P19).

In Germany, PC5 uses its specialist staff to support the field sales personnel. The requirement is that each salesperson was once a teacher in any discipline, discussing at a lower-level data logging in the school. If there is a subsequent interest, a specialist employee (or boundary agent) will then take over:

Building on the literature review in KAM and specialist salespeople, in all of the 11 of the 13 case study companies the importance of the technically competent sales agent in front of the customer was evident. Also, the practices of the 'hard-sell' were especially frowned upon. The relationships between the technical salespeople and the boundary agents were also highlighted as being a strong foundation for effective knowledge transfer and VRIO resource development.

Developing a customer-focused culture rather than product-focused was the preferred option for 10 of the case-companies. The remaining firms used a dual focus approach because of their more significant market positions. The implications for developing human resources as a source of sustained competitive advantage has some basis in previous studies (For example, Wright, Dunford, & Snell, 2001; Wright, McMahan, & McWilliams, 1994).

The Dutch firm relied heavily on a dynamic relational approach, harvesting the skills base first to enter the market as a new entrant, and then, to address the concerns of teachers having to teach STEM will no curriculum or training provided by the Dutch Authorities. The Ukraine dealer also leveraged the diverse skills base with the firm and complement shortages through boundary-spanning activities. This was a common response from 11 of the 13 case-study firms, where they would consciously build their capabilities on knowledge and expertise from boundary agents.

Having an established reputation in the science education market was cited as a key factor of success by all case-study companies. Experience and technical expertise, built and developed over the years were also regarded as a capability that satisfied all the requirements of VRIO. However, having a background in a different industry was not regarded by the CEO (P9) of PC6 (Iceland) as an impediment to future success in science education. With a core business of collecting, storing, and

analysing data on behalf of a worldwide network of industrial clients, the firm regarded the data collection in schools to be a natural extension. Although there are no formally educated scientists in the firm, P9 is confident that the skills of his engineers can be transferable to the education market with the correct guidance:

“...We have a strong technical base in our company. I feel confident that we have the ability to transfer that to schools as well. If we can get some of the teachers on board, and the technical support we can back them up with, will be a strong value offering to the teachers of Iceland...”

In contrast, PC8 (Turkey) has been in the education business for many years and have established a strong reputation based on quality and service. They have traditionally manufactured “traditional” equipment and have only been a distributor of data logging for a relatively short period. Their established practices of working closely with customers from a solutions point of view have been transferred to the promotion of data logging equipment.

PC2 (Czech Rep), PC7 (Slovakia), PC12 (Croatia), PC10 (Finland), PC11 (Poland) and PC13 (Estonia) has all been founded by individuals who were once full-time teaching professional in science-based subjects (except PC12). These firms are smaller SMEs and fundamentally understand the needs of the science practitioner. Their preoccupation with technical support, training and pedagogical materials is reflective in their approach to marketing and sales.

Strategic alliances were an alternative method of gaining essential knowledge from the market for 8 of the case-study companies. In this context, strategic alliances refer to “partnerships” with third parties such as trade and educational associates and MNC tech companies.

Three of the case companies (PC3, PC4 and PC13) stressed the benefits of strategic alliances. In the UK, PC4 work closely with the Institute of Physics (IoP), Royal Society of Chemistry (RSC) and the Association of Science Teachers (ASE) as a method to exploitative learning. The firm also encourages collaboration with selected high-profile schools (For example, Charterhouse and Harrow), where educators are happy to test new products and write reviews for education journals. The CEO of PC4 views such alliances as being a higher priority than engagement with boundary agents. A similar alliance is employed in Estonia (PC13), where the firm supports a teaching support centre that serves all of the country based at the University of Tartu in the use of data logging equipment.

PC7 forges a unique alliance in Slovakia, where a local publisher of science textbooks uses the resources and imagery supplied by the firm. The CEO (P12) describes the relationship:

“...We have worked since last year with a publisher of textbooks here, and they came to us to ask if we could help with the experiments in the book. In the end, they used the local Genisys

experiments and the images we gave them on setting up data logging we get requests from schools when they are curious about what they areit has been a good relationship...”

PC3’s P3 (Holland) regards their relationship with the supplier as more of an alliance because the brand brings them certain credibility as they try to enter a new market segment. Similarly, strategic partnerships with companies such as Philips, who have a vested interest in the promotion of science in Dutch schools, bring mutual benefit to both organisations.

In summary, the central themes (Table 5.20) that have dominated the discussion with the distributors have been the importance of boundary agents and the effectiveness of conducting workshops as part of a sales and marketing strategy. Also, information gleaned from conducting workshops, and other activities carried out by boundary agents, are also crucial in assimilating essential knowledge for the firm and contributing to the creation of VRIO resources that customers perceive as having value. The exception is the UK distributor, who still values the contribution of workshop activities, but relies more on traditional marketing activities and support from the exporting company.

Table 5-20 – Main themes from research.

Theme	Main Themes (Tree nodes)
1	The importance of using teachers as boundary agents (spanners) is a highly successful method of selling, especially is combined with specialist salespeople through a customer focusses strategy.
2	The firm has greater credibility in the market if they employ teachers (part-time or full-time) as boundary agents (spanners) and are a primary source of information.
3	The localisation of products in the host market is of critical importance, especially if the mother tongue is not English, although not as important in English speaking countries.
4	Boundary agents can have significant input into the localisation of product and for VRIO capability building in the case-study firms.
5	Boundary agents can have a positive effect on the relationships between the exporter and localised distributor through information exchange.
6	Adding value that satisfies the conditions of VRIO better positions the firm to bring value back in the form of superior profits than rivals, much less customer churn, and temporary or sustained competitive advantage.

5.7 Evaluation of the Research Model

The findings demonstrate that SMEs operating in the specialised science education market is reliant on three interconnecting domains of influence that determine competitive advantage. The fields of boundary agents, the customer and an effective KAM system (including technical salespeople) all are interrelated. Boundary agents are capable purveyors of knowledge. Unless that knowledge is correctly codified and acted upon promptly, the necessary VRIO resources are not produced rapidly enough to out-compete with their much larger rivals who have larger resources. While VRIO

resources are built within the firm, they can also be developed, built and shared, between the customer and the firm.

The theoretical model in Figure 3.1 earlier has proved to be rather simplistic to explain the more complex relational model shown in Figure 5.1 below. The study concludes that for sustained competitive advantage to be achieved, the supporting resources and value-creation and capture assets are developed through an effective and highly focussed customer-centric strategy. In SMEs, that is the individual boundary agent and managerial agency. In larger corporations, this might be at departmental, or the individual worker level. The model suggests that there is a threshold level of boundary agent involvement that can lead to a competitive advantage for the present. Where there is a high level of boundary agent(s) involvement, a situation of sustained competitive advantage is achieved, at least over the short term. As customers become 'evangelists' for the product and the SME itself, sustained competitive advantage is achievable over the long term.

Figure 5.1 shows that the firm must possess a basic infrastructure of 'firm resources. This first level is possessed by all firms operating in a specific market. At this level, no firm possesses anything different or unique from its rivals. The next level is termed 'distinct resources' which describe functional attributes that are valued by the customer and are sufficient to allow for a competitive advantage for the present (Ackerman and Eden, 2011). Hence, these VRIO resources eventually will be copied or substituted for equal or higher customer value by rivals. It is at this point the theories of RBV and dynamic capabilities diverge. Dynamic capability theory suggests that in markets that are volatile and subject to rapid change, effective asset orchestration is critical to maintaining the ability to react to exogenous shocks or market stimuli. In this regard, Teece (2007) makes specific reference to reconfiguring assets to sustain competitiveness and ward off threats to the firm. Arguably, reconfiguration and maximising asset usage are more critical in SMEs competing against larger rivals, who do not have their larger rivals' resources and can learn by trial and error. Asset and resource orchestration, according to Teece (2007) refers to "...the managerial search, selection, and configuration of resources and capabilities. The term intends to convey that, in an optimal configuration of assets, the whole is more valuable than the sum of the parts..." (Teece, n.d)

The RBV approach is regarded as more static arguing and focuses managerial attention on the firm's internal resources to identify those assets, capabilities and competencies with the potential to deliver superior competitive advantages. The RBV suggests that organisations must develop unique, firm-specific core competencies that will allow them to outperform competitors by doing things differently. The key point is that not all resources are of equal importance, nor do they possess the potential to become a source of sustainable competitive advantage. This study has some congruence with aspects of both theories, as the findings show that the factors of competitive advantage depend on different combinations of VRIO in different markets.

The next level is collectively described as the ‘black-box’ of strategic resource configurations where the firm’s ability to develop and re-configure existing resource and capabilities into the important market-specific VRIO resources needed for competitive advantage.

All of the case-companies alluded to the importance of skilled and motivated workers. They, in addition to boundary agents, can make the necessary asset re-configurations as required in a timely manner. This is reflected in the moderating and mediating effects of the managerial agency at two levels in the VRIO resource development cycle.

The essence of the approach to attain competitive advantage by the case-study SMEs was to do so in a niche market as economically as possible. This is achieved by first creating value for the customer and then developing the VRIO resources that captured the value back through supernormal profits with minimal further investment. The SME is, therefore, able to retain profits to further invest in localising the product and delivering a higher level of support, thereby consolidating competitive advantage in other ways.

The fine-grained perspective from the individual worker is further endorsed by the feedback loop that is in continuous flux between the—distinct resources and capabilities and the constant reconfiguration of firm-specific signature processes represented through the fluid VRIO resources. This ‘fluidity’ cannot be explained by mutually exclusive resources that are VRIO configured. The need for constant renewal of signature processes is dependent on several different types of resources and capabilities that are all interrelated. Thus no VRIO resource or capability can be distinct and mutually exclusive in the context of SMEs.

The relational aspect of the superior value creation for the customer is elucidated through the strategic alignment of resources and capabilities within the ‘black-box’ in Figure 5.1. Here in the firm, the inputs from boundary-spanning activities are shared with the KAM specialist and managers. Building on the distinct VRIO resources already in the firm, and are necessary to maintain a competitive advantage, the resources generated through internal and external factors and the VRIO resources that are fluid in response to changes in the environment of the firm. External factor refers to the activities of rivals, or changes in the market environment influenced by new technology introductions from complimentary products, or changes by the government in educational policies, to name but a few. Internal factors may involve investments made in new technologies, or the acquisition of another firm, or the release of a new product, to name but a few again.

If all these factors within the ‘black-box’ are correctly aligned in a strategic sense, the findings suggest that they will lead to superior firm performance over what was there previously. The net result is a new and higher level of value creation for the customer, that then is delivered and operationalised through ‘signature processes’ that are characteristic and recognisable for the firm. If,

through means such as government standardisation of the products (e.g., Finland, Turkey and Ukraine), or the success in countrywide tenders (e.g. Slovakia), or by taking ownership of the STEM teacher education because of the lack of government support (e.g. Holland), the superior value-creating signature processes archive a 'locking-in' of the customers over a long period. It is at this point, and it can be said that a sustained competitive advantage can be confidentially achieved.

In order for that competitive advantage to be sustained, the value must be captured back in the form of profits that are not derived from pricing-led strategies, so that profits remain above the market average. However, the firm must stay vigilant against changes in their environment from newer pedagogical approaches that might challenge the use of the equipment in schools, new rivals appearing, or corrupt practices. Thus the firm needs to continue to invest in knowledge-gathering, and assimilation practices to refresh the activities within the 'black-box' to mitigate against the core-rigidities (Leonard-Barton, 1992). Thus, the knowledge creation and simulation box are shown in Figure 6.3 has two inputs. The first is from the superior value creation strategies in a continuous feedback loop to the factors of VRIO creation inside the 'black-box'. Second, re-investment from the superior rents (profits) achieved to fund the changes required for the cycle of superior value creation to begin again.

When firms achieve a sustainable competitive advantage over a long period, complacency or lack of foresight creeps in, and the market position is lost. Failure to see the changing market for how Kodak's customers would embrace digital photography resulted in a once-great behemoth facing bankruptcy at one stage. A similar lack of judgement by IBM allowed new entrants to enter the personal computer market and grow to be larger than IBM eventually (once the world's largest company), is a testament that competitive advantage is not guaranteed to be sustainable for anyone.

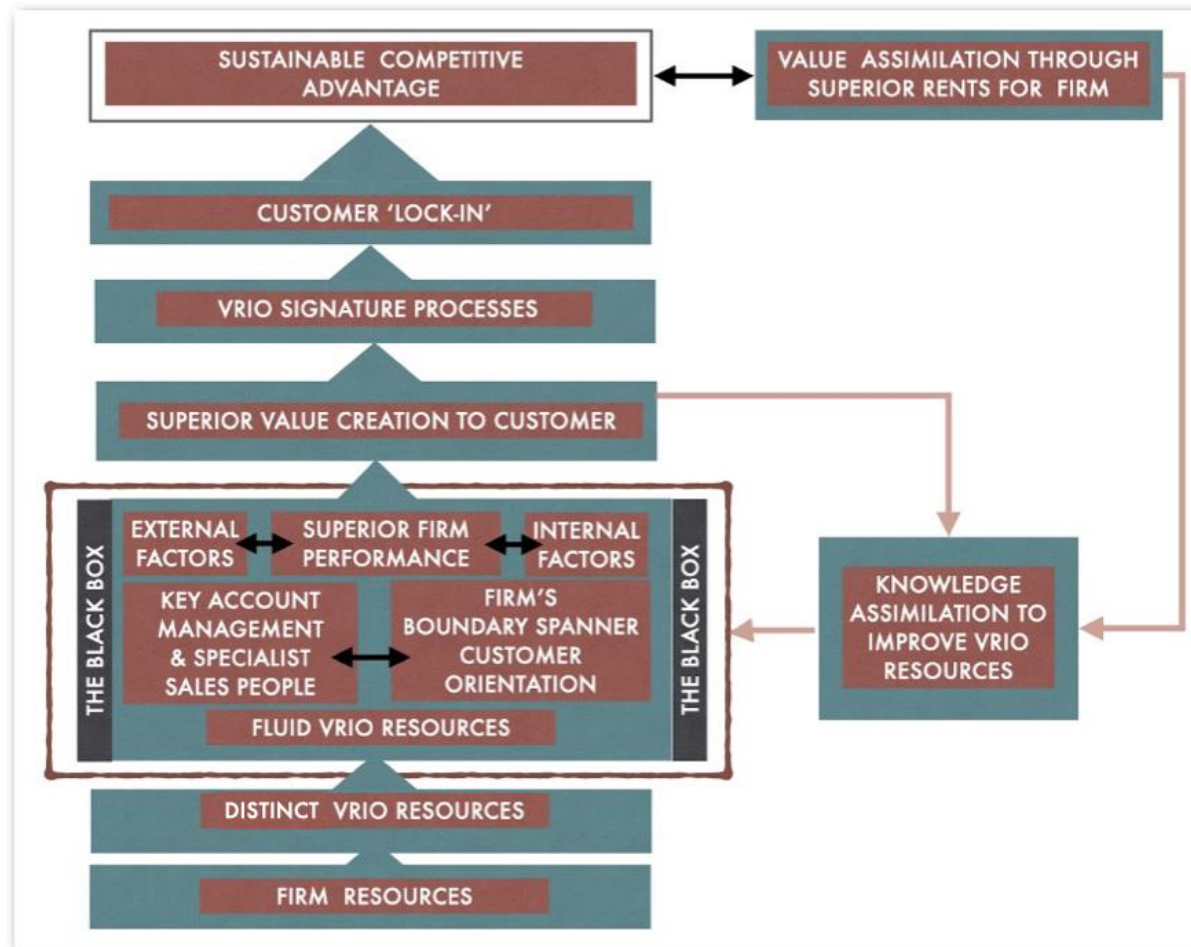


Figure 5-1 – Final theoretical model

5.8 Summary of Chapter

The Chapter started with a brief overview of the pilot study which concluded that there was a statistically significant difference between a current user and a non-user of data logging technology in their intention to use to purchase the equipment. The effect sizes of one group over the other was medium to small, but nevertheless it did exist. The function of the pilot study was to provide some ideas and direction for study for the qualitative main study.

The qualitative study addressed the following research questions:

RQ1: How does knowledge integration through customer orientation and boundary spanning influence VRIO resource configurations?

The first research question sought to understand if there was a specific relationship between knowledge capture through a customer focus strategy and the engagement in boundary-spanning activities. In other words, was important knowledge capture more effective when technical salespeople engaged with boundary agents directly more effective? The findings have revealed that first, a customer focussed strategy must be in place, followed only then by the engagement and relationship building between the technical salespeople and boundary agents. The findings also reveal that it is not a simple process just to gather knowledge and then build to attain the all-important conditions that give rise to VRIO-centric resources and, ultimately, competitive advantage.

RQ2: How do knowledge generation and KAM managerial actions contribute to the attainment of competitive advantage through the development of VRIO resources?

The importance of a KAM-influenced customer focus on value creation is an important and consistent theme in the findings. The knowledge generated through boundary spanning is extremely diverse, and one would expect that it might be. No two organisations or firms are the same, and none will operate in identical markets, but some generalised principles hold for almost all conditions. As will be discussed in further detail later, the critical importance of acting on accurate information that is correctly decoded and operationalised with haste is a common theme. Thus, the absorption of valuable knowledge directly from the market allows managers to create the necessary resources and capabilities, that, through time, develop to the VRIO status.

RQ3: Where is the value created and captured by the firm?

As outlined in the discussion in RQ3 above, those firms that have developed a robust knowledge development process, underpinned by a culture of clear customer focus, are in a good position first to develop good customer value, and later, capture value back. The different firms discussed various strategies, and value capture was measured across a broad scale from only attaining higher profits than

rivals, to locking customers in for long periods – essentially build towards a sustained competitive advantage.

In summary, the research followed a multi-case case-study approach through a pragmatic philosophical paradigm to better understand the VRIO capabilities needed in SMEs to in the market profitably and attain competitive advantage. The critical evaluation of the findings and their implications for the RQposed and the key implications for research now follow in Chapter 6.

6 Discussion

6.1 Introduction

This study is concerned with how small and medium-sized enterprises (SMEs) create and sustain competitive advantage. This chapter is divided into two parts – the first part examines the findings of Chapter 5 primarily through the lens of the RBV and the development of the VRIO resources that are necessary for competitive advantage. The “holy grail” of strategic management still remains the explanation of how and why sustained competitive advantage is obtained. The discussion that follows illustrates the diversity of the resource configurations from the 13 case-study firms and looks for commonalities in the ways they create and capture value. Likewise, in an attempt to illuminate the other great RBV mystery of a true definition of a resource, the chapter will continue with an overview of the resources considered by managers as candidates for investment to morph into those that satisfy the conditions of VRIO. While the study was grounded in the RBV Theory, it is necessary to point out that it is also equally important that the case-study firms were all SMEs. Therefore, the discussion and the conclusion to this study will also be with the view of VRIO resource configurations situated in the context of the SME.

This chapter will conclude with a critical evaluation of the findings and how they answer the research questions and the extent to which they are congruent with existing literature.

6.2 Research Rationale Aim and Objectives

As stated earlier, the study centred on the exploration of VRIO resource development and competitive advantage in SMEs operating in a niche science education market in Europe. Specifically, the study sought to understand the underlining factors that lead to competitive advantage in SMEs through the lens of the RBV Theory. The chosen RBV framework was used because it is addressed the most fundamental challenge at the heart of organisational survival directly, and what internal factors give rise to competitive advantage and how can it be sustained (Srivastava et al., 2001). In an SME sense, the RBV is particularly suitable because it focussed attention on the firm for the answers, rather than the environment. However, in relation to SMEs, the RBV requires that additional streams from the literature are used to elucidate the parts of the RBV that are ambiguous – for example, KM, KAM and boundary-spanning for the VRIO resource building on the back of knowledge creation, transfer and deployment by managers. But, as a theoretical concept, RBV remains underdeveloped. The under-development is even more acute in SMEs. This is because it is unclear on the nature and substance of value and a clear definition of resources that is not over-prescriptive

The growing popularity of the paradigm has motivated many researchers to propose a multitude of conceptual models, which remain under intense empirical scrutiny. The lack of empirical research, coupled with the neglected area in SMEs, was the first of three motivating factors in carrying out this research. The second reason was to focus on the origins and development of value-added resources in SMEs through its works and boundary spanning activities, to address the criticism of the concept being of limited use to practising managers (Colbert, 2004; Galbreath, 2005; Priem & Butler, 2001b; Wu, 2010; Zubac et al., 2010) The final motivation was directly applicable to the environment in which the researcher is fully employed: that of the mediating effect of using boundary agents in SMEs in the creation of VRIO resources and capabilities, and how and if, they lead to competitive advantage.

To address the deficits just discussed, the study sought to define the contribution of boundary agents working with technical salespersons and managers to the creation of value-added resources for customers from VRIO activities that lead to competitive advantage for SMEs operating in the science education market. For this study, the individual actors (boundary agent and firm's employees) were *the* unit of analysis and the effect exerted on the co-creation of value and the quest for competitive advantage.

6.3 Summary of Significant Findings

The findings from the exploratory pilot study concluded that there was a strong correlation between customers who might purchase and use data-logging equipment if recommended by a colleague or influencer that was considered important. In the context of this study, the influencer is the boundary spanner. The findings, in of themselves, are not profound but do serve to illustrate that there was a case for research in the primary qualitative study about the influence of boundary spanners exerted over customers to try out the new technologies by colleagues who already use the equipment. The colleagues in question, are the boundary spanners (or boundary agents) who work with the supplier companies (the 13 case-study firms).

The findings of the main qualitative part of the study are now discussed in turn under each of the three research questions.

6.4 RQ1: How does knowledge integration through customer orientation and boundary spanning influence VRIO resource configurations?

The data from the exploratory pilot study shows that boundary agents exert a positive influence on a decision to purchase data logging technologies. The findings demonstrate that there is a complex, interrelated process that cannot be simply defined as just being mutually exclusive, as frequently suggested in the literature.—The finding from the qualitative study questions the ontological perception of the concepts of resources and the quantification of value and suggests that they are that not easily defined because they are essentially a social construction.

The key themes derived from the findings are first summarised in Table 6.1.

Table 6-1 – Summary of RQ1 hypothesis and findings

Key Themes	Relevance to the study
Knowledge codification mediated by boundary agents has a positive effect on the firm's capacity for value creation for the customer.	Knowledge gained and codified by boundary agents is shown to have a significant effect on developing the firm's capacity for sensing opportunities.
Knowledge gained through workshops by boundary agents has a positive influence on the firm's capacity to sense information; and	Knowledge acquired through the agency of boundary spanning workshops is shown to exert a significant effect in developing the firm's capabilities to be more effective at sensing important information.
Market information gained through workshop sessions conducted by boundary agents exerts a positive influence on the firm's capacity to develop value-added resources for the customer,	Market intelligence derived from boundary agents delivering customer-focused workshops influences the way the firm views its resources and what path is required to create VRIO resources.

An essential function of the boundary agent is to codify and communicate the concerns of the customer accurately. The findings elaborate this capability in some depth, emphasising the critical requirement to carefully craft the marketing message focussing on the unique selling proposition offered by the supplier. Supported by VRIO signature processes, a level of service that is valuable to the customer develops over time that is not possessed by rivals. The case-study SMEs who engaged boundary agents in a more active role in the firm were far more likely to generate the important VRIO resources and capabilities.

An exhaustive study by Birch & Burnett (2009) concluded that barriers to technology adoption in education included institutional barriers, specific inhibitors, and pedagogical concerns. The range of challenges facing the SME is thus as complex as they are varied. The SMEs that were more successful in gaining market share were those that encouraged boundary agents to participate in the firm. The findings demonstrate that the range of dynamic capabilities in the SME are varied, and in

some cases, overlapping. Several of the case-study SMEs alluded to temporary competitive advantages gained by novel practices and customer support initiatives until their larger better-resourced rivals were able to offer similar customers support incentives. However, as the VRIO resources and capabilities build and become more specialised imitation by rivals becomes less of a threat. The findings demonstrate that VRIO developed are highly relational in nature and are composed of resources from various origins.

The importance of combining new and existing knowledge to the process of innovation in firms is well established in the literature in larger organisations (Chang, 2003; Ettlie & Pavlou, 2006; Winter, 2000), as well as in the SME (Bapuji & Crossan, 2004; Villar et al., 2014). However, the precise mechanisms of how knowledge is codified and by what means are given scant attention.

The findings do reveal that it is of vital importance to have knowledgeable employees as antecedents to the development of important resources that are valued by the customer. However, all the eleven respondents who extensively use boundary agents were cognisant of the fact that developing value-added VRIO resource and capabilities reconfigurations are just not a simple matter of acting on information (codified or not) promptly. Effective knowledge integrations are built on collective learning and not exclusively on the skills of individuals, regardless of the size of the firm. In a study by Teece (2012), he concluded that where the CEO was the founder of the firm, extreme dependence on them started to diminish over 5 to 10 years because of established routines as repeated action sequences. In this study, the interchange between boundary agents and managers, or technical salespeople developed signature routines that, in some cases, satisfied the conditions of VRIO. Where the resources, capabilities and relationships between boundary agents and the firm were strong, there was a higher propensity that competitive advantage could be sustained over a period of time. The more the boundary agent was integrated into the SME, the less the likelihood that core rigidities would develop, thus stifling the development of new VRIO resources.

All thirteen multiple case-study companies reported that knowledge is built incrementally and used to reconfigure resources and capabilities over time. These findings find congruence with Zollo & Winter (2002), who refers to “ordinary capabilities” which are all about maintaining a minimal capability to participate in a market. Ordinary capabilities could well be capabilities that are no longer capable of attaining a competitive advantage; in other words, they are lost their VRIO-ness.

However, this is not enough for the SME competing against larger rivals, because ordinary capabilities are just “problem-solving for the present” and routinised repeated action sequences over time. The sensing that occurs in workshops is very much outside of the firm, so the manager receives important knowledge after the event. This was cited as one of the dilemmas of the firm, as to whether they should always have a professional salesperson present at each session. In general, the consensus was that the most effective method was to hand over the promotion of the products to the boundary

agent in the workshops and general teacher gatherings. Thus, any feedback about the product and the supplier are passed without any inhibitions on the part of the customer. Although, it was also generally considered that the presence of a technical salesperson at some point was also a positive decision by the firm. The key message 11 of the 13 SMEs who actively used boundary-spanning activities was that they were a customer-focused organisation.

The respondent managers in the study wanted their customers to know that any recommendation mediated through the boundary agents suggesting improvements in training, service, product specification, or whatever, was taken seriously, and acted upon.

The conclusion to the findings of RQ1 is that through a carefully crafted and focussed customer-orientated approach, hosting the gathering of customers with boundary agents is a particularly affected way to capture important knowledge. However, this is a bilateral process, where the more successful firms employ technically competent sales professions (who may also have been former teachers) to liaise with the boundary agents to correctly codify the information to present in company meetings. All of the case-study firms who engaged in boundary-spanning activities attributed such knowledge gathering as important and influential factors in the reconfiguration of resources and capabilities. While it is impossible to attribute boundary agents' influence in VRIO resource creations, it is possible, however, to know that the customer returned after a short period to purchase equipment. As will be alluded to in the conclusion chapter, only a longitudinal study of several years will definitively categorise the actions taken from knowledge codifications as being antecedent VRIO resources influencing competitive advantage. It is certainly a limitation of this study.

6.5 RQ2: How do knowledge generation and KAM managerial actions contribute to the attainment of competitive advantage through the development of VRIO resources?

The central tenet in RQ2 is to the extent to determine how a firm's resources are leveraged by managers via the learning embedded from knowledge generation in capabilities and resources that lead to VRIO resource classifications. Knowledge derived from boundary spanning and through technical transforms resources to generate value for the customer, and the capture value back to the firm, can only be through the entrepreneurial and leadership skills of competent managers. Examples from the findings of methods used to compete against better resources rivals included segmentation of markets, differentiation of product and service and customer-centric positioning represented core elements of information-driven VRIO resources building strategies.

Table 6-2 – Key Themes RQ2

Key Themes	Relevance to the study
KAM inspired knowledge gathering with decisive managerial action builds resilience in SMEs.	The extent to how these resources are leveraged via the learning embedded from knowledge generation in capabilities and resources that lead to VRIO classification.
Customer-focused strategy aligned with managerial action agility in response to critical market knowledge can reverse a temporary competitive advantage by a rival.	Customer value in market niches can be generated by targeting different market segments and/or different competitors by leveraging boundary spanning.
A strategic KAM structure with competent managers using knowledge wisely can develop a sustained competitive advantage against much larger rivals.	Knowledge (and managerial acumen) is essential for competing in a short-cycle, heterogeneous market. Precise external knowledge is required through trusted boundary spanners should be a distinct advantage.

In the specific case of this study, the role of the boundary agent is hypothesised to have a critical role in assisting senior managers to achieve asset orchestration, renewal, and redesign of routines. Teece (2012, p. 5) suggests that “...asset alignment, co-alignment, realignment, and redeployment...” should be the function of the manager, whether it is a continuous or periodic process. The findings of this study find congruence with this view. The involvement of boundary agents brings with it an expert who is respected by the customer and who can offer succinct knowledge to the firm. In so doing, complementarities inside and outside the enterprise are maximised. The importance of combining new and existing knowledge to the process of innovation in firms is also recognised in the literature (Chang, 2003; Ettlé & Pavlou, 2006; Winter, 2000; Nonaka, 1994; Nonaka et al., 2016; Nonaka & Takeuchi, 1995), also in the case of SMEs (Bapuji & Crossan, 2004; Villar et al., 2014).

However, there is little empirical attention in the literature given to SMEs and the unique challenges they can often face. All respondents referenced the need to share, store and develop superior KM processes that inspire KAM routines. Whether it was as simple meetings or more complex customer relationship management systems, all case-companies believed that superior KM coupled with customer-focused KAM strategies would, sooner or later, aid in the development of VRIO resources and facilitate a dynamic capability development (where applicable). Several multiple case-study SMEs believed having superior knowledge in itself, was a necessary pre-condition to assisting the firm in identifying new trends, successfully entering new market segments and creating value for their customers. In studies carried out on exporting firms, superior KM has also been shown to facilitate higher performance (Cadogan et al., 1999; Cadogan et al., 2002), and the ability to recognise new opportunities in large firms was also predicated on superior KM in the empirical literature (Hughes et al., 2010). The findings reveal that the use of boundary spanning techniques and the deployment of technically competent salespeople is an excellent facilitator of important knowledge for the SME who do not have the resources or industry contacts as their larger rivals.

Most of the respondents made available time and meeting spaces for workers to propose ideas for consideration by management, often with boundary agents included. In the larger SMEs, where a managerial structure existed, all of the interviewees viewed the generation and sharing of ideas of great importance for creating and planning VRIO strategies to increase values for customer and firm. In a similar way to Villar et al. (2014), company managers viewed idea generation from employees as a resource of the firm. In the case of the **PCI**, they specifically passed ownership of the idea to the originator and involved them in every step of its implementation. This novel approach has the effect of developing new skills in workers, sharing ownership of the idea, and the creation of new and innovative practices. Tidd & Trewhella (1997), and Rogers (2004) recognised similar approaches in their empirical research and concluded that such practices could reap significant rewards if the SME is agile and flexible.

Thus, the findings offer an insight into where and how value is determined and created. The debate in the literature, as discussed earlier as to *how* value is created through the transformation of resources continues. The study recognises that there exists a significant gap in the literature about the nature of value and whether it should be determined externally to the firm in the marketplace, or internally in the form of competitive advantage. Given that the attainment and sustainment of competitive advantage are at the core of the RBV, how value is created and captured has not been a focal point of the discussions in the RBV scholarship (Barney, 1991; Best, 2009; Bowman & Ambrosini, 2000; Brandenburger & Stuart Jr, 1996; L. J. Ryals & Holt, 2007). Hence, the study has highlighted that knowledge creation through meetings between the firm's workers across all levels is where the foundations of value-adding strategies begin. Thus, the study highlights those value-added strategies start at the level of the individual workers in SMEs is an important and fertile source for understanding how value-generating resources are conceived.

Allied to internal knowledge and innovative ideas generation is the integration of externally gained knowledge through boundary agents. The link between the 'synthesised knowledge' within the firm has been recognised recently by (Nonaka et al., 2016) and earlier by Nonaka & Takeuchi (1995) as being a facilitator of a definite link between KM and important resource creation. The findings showed that effectively synthesised knowledge could only be supported by suitable and practised operational capabilities and well-honed processes. Without these capabilities and procedures, knowledge is simply lost and not synthesised into anything useful.

The challenge for the SME is that KM should become an established routine in the firm. The finding demonstrates that knowledge gathering through boundary spanning does influence the creation of the VRIO resources and capabilities that can lead to competitive advantage. The findings do find resonance with the view that KM routinisation is a higher-level resource that can be disaggregated into its creation and application attributes (Spender & Scherer, 2007). The findings do this by

elucidating the importance of knowledgeable employees as antecedents to the development of essential resources that underpin the VRIO inspired value-added routines (Nieves & Haller, 2014; Rothaermel & Hess, 2007).

The findings in this research find congruence in the literature with the crucial role that knowledge plays in the firm's transformation inherent in developing knowledge capabilities (Henderson & Cockburn, 1994; Zahra & George, 2002; Zahra et al., 2006). The continual development of knowledge capabilities into a capability referred to by Cohen & Levinthal (1990) as the "absorptive capacity" of the firm. This is defined as the ability to identify and acquire new knowledge, absorb it, and then exploit it. Once the 'synthesised knowledge' is operationalised as a routine by the specialist workers and boundary agents, it then becomes incorporated into the firm as a 'signature process' from which the important VRIO processes evolve. In all of the respondents, a strategy and willingness for change were evident, to varying degrees. The six case-companies who had actively recruited boundary agents to work full-time with the firm showed a higher level of flexibility and propensity to change as a reaction to external impulses. Hence, the firm enhanced its absorptive capabilities by aligning the boundary-spanning bridge closer to the 'heart of the firm'.

The former boundary agents now working in the SME, actively maintained close contact with former colleagues and recruited them as external boundary agents, thus forming a strong cohort of competencies that acted as a virtual autonomous business unit spanning the border between customer and supplier. Where the third level of 'boundary agent' (the 'evangelicals' as noted earlier) a significant competitive advantage has been realised that was heterogeneous to the case-study SME's rivals. There were no parallels in the literature that the researcher was able to find, where a business unit functioned partly outside of the firm semi-autonomously and yet exerted such influence over management for a change in business practices and strategy. There has been some empirical research into business networks and government contacts to assist the firm to work towards gaining a competitive advantage and develop dynamic capabilities (Hoskisson, Eden, Lau, & Wright, 2000), but it has not been discussed in the literature review as it outside of the remit of the study

Slater & Narver (1999) conclusion in their study of larger corporations that market-led orientation was superior to a customer-led one, seems over-simplistic and inaccurate at the level of the SME. Adner & Helfat (2003) attribute managerial cognition as a significant factor in developing idiosyncratic VRIO capabilities. Moreover, these idiosyncratic which themselves become causally ambiguous, a condition of sustained competitive advantage is, therefore, possible while this condition lasts. For the SMEs in this multiple case study, where there are less than five employees, internal coordination of resources and capabilities is not a fundamental issue. In the case of the larger SMEs (ten or more employees), the need to coordinate highly skilled employees was more pertinent.

The findings showed that the CEO or senior manager needs to possess the capacity to coordinate, combine and integrate the firm's resources to drive the success of the firm. The literature is replete with studies that show financial performance, innovation, boundary spanning, and knowledge generation are directly attributable to managerial driven routines. (for example, Abell et al., 2008; Eisenhardt & Martin, 2000; Kogut & Zander, 1992; Pundziene & Teece, 2016; Teece et al., 1997; Winter, 2003). Resources and capabilities that bring value to the customer do not occur in isolation as the finding has shown.

In summary, the local distributor will gain a good understanding of latent customer needs through the use of boundary agents. Moreover, firms can build customer loyalty and retain customers over the long term and build a solid partnership with customers through boundary agents. The importance of finding a balance between being a highly market-orientated firm and one that is customer-focused on turbulent times is imperative to sustainable competitive advantage.

6.6 RQ3: Where is value created and captured by the firm?

RQ3 builds on the previous RQs and tackles the contested nature of value and the elusive resources 'black-box'. In effect, the findings culminated in elucidating how foundations of value are created for the customer and then captured back to the firm.

The questions used to explore value creation and capture will be:

- (i) Where is value determined?
- (ii) Where is the source of value?
- (iii) How is value created?
- (iv) When and where are the VRIO resources identified?
- (v) What is the degree of resource specification and specialisation needed? And,
- (vi) The extent to how resource interactions affect development of VRIO resources.

These questions also represent areas of conflicts and gaps in the RBV literature.

6.6.1 Where is 'value' determined?

The literature is divided on where value is determined, and, indeed, how value can be defined. Du et al. (2006) suggested in Section 2.3.7 that the concept of customer value ought to be relatively simple and unambiguous. The study tries to bring some clarity to the varying interpretations of customer value. Naumann (1995) suggests that customer value depends on a triad of product quality, service quality and value-based prices, which confirms similar findings in this study. However, Naumann's contribution is only part of the problem. Flint et al. (2011), offers illuminates a path toward understanding how value can be recognised through the development of 'customer value anticipation', as discussed earlier in Section 2.3.7. Madhavaram and Hunt (2008) recognised in our

discussion earlier, the difficulty to achieve a level of understanding of ‘customer value anticipation’ without close relational interaction with customers.

As the findings also have shown in this study, is that knowledge has been generated from somewhere to allow managers to develop the skills and knowledge to accurately align themselves with the requirements of the customer, and to *what* the customer attributes the highest value. The findings conclude that such a level of knowledge is a higher-order and interconnected resource, or group of resources. The relational attributes of market relating capabilities, learning platform capabilities, organisational learning capabilities, or knowledge creation capabilities, has been seen in Ukrainian, Dutch, German, Estonian, Belgian and Slovakian case-study firms to good effect.

The literature stops short of a fine-grained determination of where value is determined, which is quite possibly due to the general focus of RBV theory on larger organisations. In researching SMEs, the researcher is forced to use a unit of analysis at the individual worker level, and in so doing, allows for a fine-grained evaluation of value determination. It is thus through the interactions at the level of the individual worker that value can be better determined in terms of the customer and the supplier in two ways. First, in terms of the customer, value can be measured through choices that the customer makes. In an open market where the customer can decide between numerous suppliers of the same or similar products. When a customer decides on one product over another, decisions are made on factors important to them. These factors can often be price, performance, brand recognition, or familiarity – just to name a few. Therefore, customers who chose one supplier over another does so for reasons known to them, but not always cognisant to the supplier. Second, this study shows that with a focussed customer-centric approach with the customer using technically competent salespersons and boundary spanning activities, the criteria for purchasing used by customers is clearer. In summary, value is determined and better understood at the interaction between the customer and the supplier. Where there are gatherings of customers, such as workshops, the conceptual understanding of value creation and capture is greater.

6.6.2 What is the source of value?

From an RBV literature perspective, when resources possess the attributes of VRIO, value flows from resources. There is no determination as to where this occurs in the literature. The study has established that direct causal links between a resource, or resources, and the VRIO characteristics and the desired attributes give rise to specific values important to the customer. The value propositions illuminated from the findings include localisation of products and support materials, competent technical support salespersons, relationships underpinned through the trust of the suppliers, the influence of boundary spanners and boundary spanning activities, the status of the firm as a partner in education more than just a supplier; informative marketing content for customers, and, after-sales customer training. Thus, these are the “*what*” are the sources of value for the customer.

Boundary spanning activities guided through a customer-centric approach is an effective way to determine what values are perceived, experienced and understood by customers. From this perspective, the firm gains an insight into the fundamental building blocks which support the VRIO resources so valued by the customer. The study argues that having direct access to value-added feedback from a customer in relaxed workshop sessions mediated through boundary spanning activities is efficient and economical. The firm with limited resources does not need to engage in expensive advertising campaigns or high-level focus groups in the same way as their larger rivals to obtain market critical feedback.

The customer-centric approach from the case-study SMEs is congruence with the views of fundamental foundations of competitive advantage from Longenecker et al. (2013). For example, Longenecker et al. (2013) state that that competitive advantage is a benefit for a company that has a product or service seen by the target market better than its competitors. The findings show that where the case-study SMEs cannot compete with larger rivals on price, they can make up for it in products that are localised to a higher standard and provide more focussed customer support. Longenecker et al. (2003) also emphasise in the literature that competitive advantage has a basis in the form of unique services, price, right products, consumer experience, and consumer convenience. Again, the case-study firms focus their scarce resources to ensure that the attributes highlighted by Longenecker et al. (2003) are addressed better than their rivals.

However, crucially, as pointed out by Porter et al. (2011) competitive advantage is derived from the value that can be created by a firm for buyers, but it must exceed the cost of the company in creating it. In other words, the firm must extract a value back from the customer that is greater than the costs incurred to create that value. The findings showed that the value given to the customers is returned to the case-study company in higher margins than competitors, 'word of mouth' referrals, a loyal following, customer-initiated training groups and a rich pool of boundary-spanning talent to use.

It is important to note, as pointed out by Porter et al. (2011), that competitive advantage can be achieved by running several generic strategies based on costs and differentiation. Of course, this is true, and a cost leadership strategy can lead to even a sustained competitive advantage. A good example is Ryanair in the low cost, no-frills air travel market. However, such a strategy requires an extremely large and long-term investment that can sustain this approach. This study is not about large corporations, it is about the SME who chooses to focus on a niche market where customer loyalty is not based solely on price advantage. Indeed, the findings from Slovakia, Turkey and Holland has demonstrated that is possible to attain a sustained competitive advantage over much larger rivals by focussing on helping the customer perform their teaching practice better.

The essential difference is that firms that operate a cost-leadership strategy (for example, Ryanair), are primarily B2C focusses, whereas the case-study firms in this study are B2B focussed. This is an important difference.

6.6.3 How is value created?

The process of transforming resources into value has not been a focal point in RBV theory. The RBV does not address fundamental differences in how different types of resources may contribute differently to a firm's sustainable competitive advantage. But what is clear from the findings are that the firm's resources are the source of value, so the firm should configure the resources to create outputs that are highly valued by customers. Examples given by managers in the study that were considered valuable to customers included the ability of the local suppliers to localise the complete experience for the customer. The Czech, Ukrainian, Slovakian, Polish, Turkish and Finnish local distributors went beyond just the translation of software into the local language. The Polish distributor produced a website that was an exact copy of the supplier's version translated into Polish, with a network of carefully selected teachers around Poland who acted as the technical support for their local region. In Finland, all of the pedagogic material is written to be an exact match for the curriculum, to become the deface textbook for Finland. Due to the success of the localisation of the product, the Finnish Educational Ministry based their end of year examinations on the software modified by the Finnish dealer. The fact was they had little choice because of the ubiquitous adoption by schools in Finland. In Turkey, which adopts a more traditional approach to science education, the local dealer embedded the data logging technologies into existing equipment. The experience for the teachers and the students was seamless thus avoiding any objections to its usage. What proves to be a successful strategic choice by the managers has resulted in a sustained competitive advantage for the present time.

The common theme from all respondents was their primary focus on the customer. It was also characteristic that several of the case-study companies paid little, or no attention to them with to the actions of competitors congruent with the divergence of perspectives on competitive advantage in the literature into customer-focused and competitor focussed streams (Day & Wensley, 1988; Sihotang, Kartini, & Rufaidah, 2016). The case-study firms who engaged more with boundary agents exhibited more customer-centric KAM practices rather than a pre-occupation with competitors. As was described by two examples from Turkey and Finland, the net result is that the firm is more confident in the strategic choices they make from the knowledge gained through boundary spanning in the pursuit of value for the customer.

6.6.4 When and where are the VRIO resources identified?

How resources are created, how they evolve, or morph has received relatively scant attention in the RBV literature (Ahuja & Katila, 2004; Lockett & Wright, 2005; D. G. Sirmon, Hitt, & Ireland, 2007; Wilden, Gudergan, Akaka, Averdung, & Teichert, 2018). The creation of resources is fundamental to managerial and entrepreneurial decisions around strategic intent and execution for value creation and capture for competitive advantage. Precisely when the collection and operationalisation of resources that together become collectively VRIO, is not possible to determine from the findings. This is primarily due to the imprecise understanding of the respondents during the data collection phase. Since firms are always changing and evolving, so too, must the VRIO resources. Insights were given from Slovakia and Ukraine at pivotal times when they were able to reconfigure their resources to claw back a large contract that would otherwise have been lost. In both cases, advice and technical assistance from boundary agents allowed both firms to undertake the necessary re-configurations of their offering to be successful in the contract. These tweaks and changes involved a re-alignment of some product specification and specifically formatted customer support materials and activities. The combination of the new offering satisfied the conditions of VRIO and was impossible for the rival bidders to imitate in a short time. Since SMEs tend to have to evolve and change at a more rapid rate than larger firms, the resources that are VRIO also change at a similar rate. While there will be 'distinct' VRIO resources that are firm-specific resources, there will be another set of more fluid VRIO resources required to change with the changing needs of the market and the competitive activities of rivals. For example, some case-study firms reported that rivals try to imitate their customer-centric approach. The workshops were used to great effect in obtaining advanced information on marketing activities and new initiatives planned by rivals. The case-study firms were thus able to report rapidly and minimise any adverse impacts. At a more extreme level, where unscrupulous rivals were attempting to unfairly (and illegally) influence large government tenders, case-study firms were able to intervene at an early stage to contest the validity of rival bids. The window of opportunity in contest public procurement bids is extremely narrow, so prompt action based on boundary-agent market knowledge is paramount. Success or failure results in either a sustained competitive advantage or being 'locked out' of the market for several years.

6.6.5 What is the degree of resource specification and specialisation needed?

The RBV literature is silent on how resources are created, how they evolve, or morph has received relatively scant attention in the RBV literature. Likewise, any discussion on the specifications of resources tends to be broad-grained, rather than fine-grained. The term 'specification' is used to map out the specific attributes of resources that confer a competence or set of competencies that allow the firm to perform certain actions in particular ways. When the resources available to the firm can result in products or services that are considered valuable by the customer, and they remain loyal to the supplier and are prepared to pay more than to a rival supplier, competitive advantage is achieved.

The finding of this study advances an understanding of the gap in the literature where little attention is given to understanding the attributes of individual resources. Thus, an opportunity is lost in a practical sense for managers to understand when investing in the correct resources is necessary to develop the VRIO signature processes.

The findings demonstrate that the resource compositions in SMEs are relational where internal coordinating mechanisms are well developed and clearly understood. Evidence of this was clearly articulated by the Dutch who explained how working groups were tasked with finding ways to create unique customer value. The Ukrainian elaborated on the openness of management to listen to ideas from all workers, then act upon those ideas that fitted the firm strategy and included the originator of the idea in its operationalisation. The Icelandic distributor developed and honed their signature VRIO processes by leveraging different competencies within the organisation from different specialisations, even outside of that of their educational section. The common theme amongst the three firms just selected is that there exists a common approach where knowledge gained through boundary spanning is used to explore methods by which value can be created and captured.

All of the case-study firms used the workshops where they could constantly monitor the levels of their commitment to the teachers and use the opportunity to benchmark against their rivals. The workshops presented a double loop learning opportunity where boundary agents could also see if the value-added changes were of sufficient novelty compared to rivals. With the exception of the Czech Republic, no other country experienced an active workshop-based approach to sales. However, the essential difference in the Czech situation was that the rival used their salespersons to conduct the workshops.

From the findings, the degree of specification of VRIO resources varies between different countries. This is probably due to the differences in the stages of economic development and sophistication of education in schools. However, a fundamental repertoire of resources that are sufficiently endowed with VRIO characteristic is necessary. This repertoire of resources will be referred to as ‘distinct’ resources. Conceptually, they are the same as the ordinary capabilities referred to in the dynamic capabilities theory (Barrales-Molina, Martínez-López, & Gázquez-Abad, 2017; Eisenhardt & Martin, 2000; Girod & Whittington, 2017; Helfat & Peteraf, 2014).

As was discussed in Section 6.6.3, the creation of VRIO resources is fundamental to managerial and entrepreneurial decisions around strategic intent and execution for value creation and capture. The degree of resource specification required has some commonality across all of the case study firms, with specific, nuanced differences within each region. However, the basic building block of the ‘distinct’ VRIO resources and capabilities must necessarily include:

- customer-centric approach.
- the firm reputation built over time.

- deployment of customer-orientated boundary agents.
- well-developed firm's knowledge integration and assimilation skills.
- agile and entrepreneurial managers.
- technically competent salespersons who are perceived seamlessly as an extension of the boundary agent.

Hence, VRIO resource specification can be specific to each industry and to each country, which might be a reason why the concept has not been given much attention in the literature.

Moving on from the generic specification for the 'distinct' VRIO resources, which can be considered as the threshold competence or capability to participate in the market. The findings conclude that the 'distinct' VRIO resources are capable of a temporary competitive advantage which might appear a contradiction in terms. VRIO necessarily means that the repertoire of resources that are value-giving are rare compares to rivals, are hard to imitate, and the firm's ability to exploit the resources or capability are required for competitive advantage. The point being made here is that there can constantly be jostling for the position of temporary competitive advantage if VRIO resources are too different between competing firms. Unless a causal ambiguity exists, the likelihood of the relative ease or difficulty to imitate can vary considerably.

A conclusion from the study is that there are threshold 'distinct' resources that are required to establish at least a participation in the market some cases it is enough to establish a temporary competitive advantage. The holy grail of strategic management is a sustained competitive advantage, which is also the ultimate goal of the firm. When such a position is achieved, for example, when a rival is 'locked out' of the market as superior rents and reduced customer churn are the result. In a different way, the findings from Finland, Czech Turkey and Holland were particularly revealing as to how a layer of harder to imitate resources, even though they might be visible to rivals, were important to sustain a position of competitive advantage. For example, the localisation of the products became so integrated into the Finnish school system that the government's Education Ministry stipulated that the software and hardware be used in the final State examinations. Since curricula change only occasionally, the effect is a 'lock-in' of all of the schools in Finland because it has become the standard and teachers want their students to be familiar with the software in the examination. In the case of Slovakia, the localisation of the product specifications led to the winning of a countrywide contract to equip all schools with the same equipment from a single manufacturer for reasons of standardisation. The market in Slovakia is effectively shut to any similar products for at least ten years. In Holland, the firm seized upon the opportunity where there was no guidance offered to teachers for a new STEM curriculum from the Dutch government. Based on an Inquiry-based pedagogy, teachers were expected to design their own resources. Deploying their team of boundary agents and technical salespersons, during the summer recess they produced an entire

textbook that was mailed to all schools the first week they returned to school. The textbook, of course, contained resources tied back to their products. Thus, a first-mover advantage was established before rivals had a chance to catch up, and the market was secured for the long term, because of repeat orders year after year. Therefore, a higher level of VRIO resources that are closely aggregated confers a sustained competitive advantage by ‘locking-in’ customer over a longer-term.

6.6.6 Resource interactions and the development of competitive advantage

The extent to which interactions of resources affects the VRIO resource configurations and development has often been noted in the RBV literature, but not as a distinctive focus of theoretical or empirical research (for example, Barney, 1991; Conner & Prahalad, 1996; Helfat & Peteraf, 2003; Penrose, 1959; Peteraf, 1993; Prahalad & Hamel, 1990; Prahalad & Ramaswamy, 2004; Wernerfelt, 1995, 2006). Resource interactions and relational competencies amongst key workers can be complicated, especially in larger firms, which is a likely reason why empirical research in this area has been largely avoided. However, the focus on SME firms allows the researcher to focus deeper since data collection is at the level of a smaller cohort of individual workers.

The literature tells us that “services” provided by any single resource gain leverage only when combined with other resources (Grant, 1991; Grant & Jordan, 2012; Prahalad & Hamel, 1990; Vidgen, Shaw, & Grant, 2017). The combining of resources usually involves an investment of some kind by the firm, be it financial or time resources. It is only sensible to do this if there is an expected future gain as value capture for the firm. In order to capture value, it must first be created. In order that value is created for the customer in the expectancy that is returned later through rents, the critical dimensions of customer value must be understood. A criticism levelled at the RBV is its lack of parameterisation of value (Priem & Butler, 2001a, 2001b), and general vagueness in its delineation of competitive advantage. In section 2.3.7 the question of value and ambiguity with which the concept has been treated in the RBV, and the suggestion from Kotler and Armstrong (2013) that customer value could be considered as four core dimensions of products and/or services, namely: attributes, benefits, attitudes and network effects.

Figure 6.1 attempts to contextualise the key dimensions of customer value for the findings of the study. At the very epicentre is the source of long term sustainable competitive advantage, the co-creation of value for both the supplier and the customer. By its very definition, it is the fusion of value that is important to retain the customer and the corresponding rent gain for the supplier.

As shown in Figure 6.1, value co-creation occurs at the nexus of the customer, boundary agent and the technical salespersons. All the actors have a key role to play in the creation of knowledge and value. As the literature has shown, the leading proponents of RBV (e.g. (Barney, 1991; Grant, 1991; Wernerfelt, 1984) recognise that brand recognition, the role of marketing and strong customer

relationships have a role in gaining a sustainable competitive advantage. However, the RBV has generally downplayed the basic processes whereby the resources are transformed into attributes with VRIO characteristics through competent management into something which is of value to the customer. The findings from RQ3 addresses that gap to illuminate in a fine-grained way, that a customer-focused firm with a developed KAM routine can independently build, and co-create, value with its customers.

Figure 6.1 attempts to illustrate the commonalities of each of the three sets of actors at each nexus of each overlapping areas of the Venn diagram. The boundary agent themselves are both a boundary spanner for the firm and a teacher in their own right. Hence, they both share a participatory attitude, or at least an interest in workshop sessions, to integrating technology into their practice. The advantage and benefits for teachers to enter network groups is well documented in the education practise literature (Hennessy et al., 2007), while network effects are regarded as one of the four core components of customer value in the marketing literature (Philip Kotler, 2013). As the majority of dealers reported, but the Czech, Dutch, Slovakian, Croatian, Turkish, German and Ukrainian firms in particular, customers were relaxed and enjoyed networking with teachers from different school and regions through workshop activities. Notwithstanding the benefit of the product training, but the opportunity to meet and build a community of practice for mutual benefit is a resource of high customer value. The output from the intersection of the customer and the boundary agent has improved market knowledge to firm's managers to allow them to react to opportunities or customers' needs through reconfiguration or recombination of resources if necessary. At the nexus of the boundary agent and the technical salespersons, there is a common shared identity and the common goals of creating activities that deliver value to the customer. This represents an important boundary where intellectual resources are used to embed and entrench internal knowledge assets in other individuals and processes in the firm. The remaining overlap is between the technical salespeople and the customer. Here both actors share the concerns about attributes of the products and customer support resources, which, in turn, is manifested through the benefits valued by the customer, and conversely, the benefit returned to the firm in important knowledge or profits.

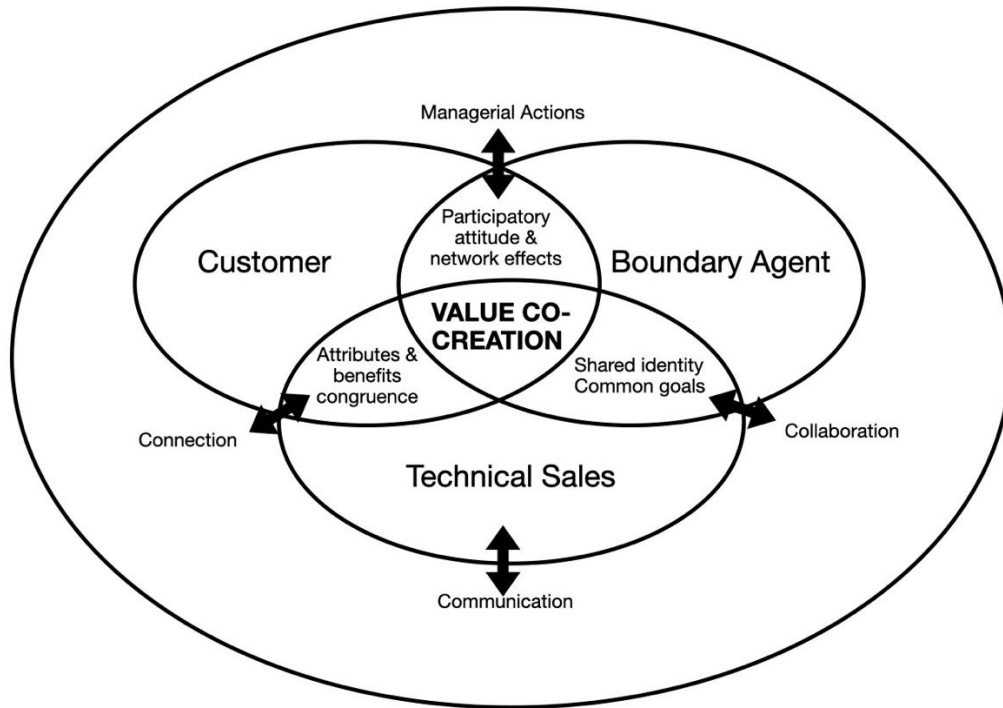


Figure 6-1 – The key dimensions of customer value

All respondents recognised that where resources are restricted to their firms, the importance of boundary agents' relationships with an agile and entrepreneurial response is pivotal to maintaining a strong position in the market. The empirical literature has long established the critical implications for developing human resources as a source of sustained competitive advantage being essential for success (Wright et al., 2001; Wright et al., 1994). However, although not directly acknowledged, the relational asset in the firms is a core foundation of resource building. A reason why they are not openly acknowledged is perhaps since they tend to be intangible and hard to quantify. SMEs tend to view them as part of the fabric and a relational asset that comes naturally in SMEs. The literature acknowledges the importance of relational competencies in firms, and the intangible nature makes them challenging to measure and therefore not nurtured (Christensen & Fahey, 1984; Fahey, 1989; Srivastava et al., 2001). The marketing literature also refers to relational market-based assets as relationships through channels, networks, ecosystems, and with customers. There is a perception that such relational assets are externally entwined, are intangible and externally organised and are not owned or fully controlled by the firm. This study has shown that externally entwined assets such as boundary agents and customers can add value back to the firm through its ability to exploit the resource or capability through the organisation of their assets in the right way.

The explorative learning by the respondents referred to the exploitation of new opportunities before their rivals, through the acquisition of new knowledge, mostly from workshops conducted by boundary agents. The empirical literature conjoins exploitative and explorative learning as closely

related, but different, constructs. These findings show that - in this niche market, at least - one construct necessarily follows the other. For example, respondents recognised explorative learning as the acquisition of new knowledge for the reason for the creation of VRIO resources that can create and capture back value from the market. Thus, the main VRIO building processes influenced through boundary spanning knowledge generation can be summarised:

- Knowledge articulation through boundary agents – the deliberate process of knowledge codification to discussion and planning for value-added customer activities to developing further opportunities.
- Modifying and building on ordinary resources and capabilities makes them more valuable to the customer.
- Learning through experience – tacit accumulation of knowledge and decision-making and problem-solving and development of resources and capabilities.
- Collective knowledge building through discussion. The use of tacit knowledge sharing between competent managers, facilitated by entrepreneurial owners, boundary spanning and technically skilled salespeople to rapidly operationalise ideas through agility ahead of rivals.
- Development of three fundamental customer focussed resource configurations underpinning all VRIO processes: (i) product leadership (innovation, localisation, quality and cost), (ii) close customer contact, and (iii) operational excellence (local support, training, quick deliveries, repairs)'
- Establishing long-lasting relationships between firm and customer build on a core customer focus and customer-connected processes
- Build value such that, over the long term, customers are locked into the products.

Boundary agents, working together with SME manager and technical salespeople, are pivotal in how resources that morph to become VRIO are developed in the case-study SMEs. Accordingly, an insight into the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments is gradually unpacked.

In the literature, the importance of absorptive capabilities is recognised as a component factor of dynamic capabilities, along with adaptive and innovative capability (Wang and Ahmed, 2007). The findings of this study showed clustering of references around the adoption of products and support to suit local market conditions and the importance of innovation in local service and imported products. Based on the wide-ranging discussions with respondents connecting back to absorptive capability building, the researchers agreed with the importance given to the capability within the construct of dynamic capabilities by scholars (for example, Hotho, Becker & Ritterspach, & Saka; Helmhout, 2012; Newey & Zahra, 2009; Zahra & George, 2002).

6.7 Research Rationale Aim and Objectives

As stated earlier, the study centred on the exploration of VRIO resource development and competitive advantage in SMEs operating in a niche science education market in Europe. Specifically, the study sought to understand the underlining factors that lead to competitive advantage in SMEs through the lens of the RBV Theory. The chosen RBV framework was used because it is addressed the most fundamental challenge at the heart of organisational survival directly, and what internal factors give rise to competitive advantage and how can it be sustained (Srivastava et al., 2001). In an SME sense, the RBV is particularly suitable because it focussed attention on the firm for the answers, rather than the environment. However, in relation to SMEs, the RBV requires that additional streams from the literature are used to elucidate the parts of the RBV that are ambiguous – for example, KM, KAM and boundary-spanning for the VRIO resource building on the back of knowledge creation, transfer and deployment by managers. But, as a theoretical concept, RBV remains underdeveloped. The under-development is even more acute in SMEs. This is because it is unclear on the nature and substance of value and a clear definition of resources that is not over-prescriptive

The growing popularity of the paradigm has motivated many researchers to propose a multitude of conceptual models, which remain under intense empirical scrutiny. The lack of empirical research, coupled with the neglected area in SMEs, was the first of three motivating factors in carrying out this research. The second reason was to focus on the origins and development of value-added resources in SMEs through its works and boundary spanning activities, to address the criticism of the concept being of limited use to practising managers (Colbert, 2004; Galbreath, 2005; Priem & Butler, 2001b; Wu, 2010; Zubac et al., 2010) The final motivation was directly applicable to the environment in which the researcher is fully employed: that of the mediating effect of using boundary agents in SMEs in the creation of VRIO resources and capabilities, and how and if, they lead to competitive advantage.

To address the deficits just discussed, the study sought to define the contribution of boundary agents working with technical salespersons and managers to the creation of value-added resources for customers from VRIO activities that lead to competitive advantage for SMEs operating in the science education market. For this study, the individual actors (boundary agent and firm's employees) were *the* unit of analysis and the effect exerted on the co-creation of value and the quest for competitive advantage.

6.8 Literature Gaps Addressed

Table 2.7 at the end of the literature review in Chapter 2 identified several research gaps in the RBV literature, and the following Table 7.1 summarises gaps filled by this study. Also, the literature

review findings identified areas of confusion and shortcomings in the RBV. This study has attempted to address those shortcomings by proposing that more empirical study should be conducted at the micro-level in SMEs rather than at the macro-level of larger organisations, where conclusions tend to be over-prescriptive and too general.

Table 7.1 addresses some of the research gaps identified from Table 2.7, interpreted through the findings of this research. The question of value should be a conceptually simple and unambiguous concept (Du, Jiao, & Tseng, 2006), the RBV does not differentiate between value that is created and value that is captured by the firm. Bowman and Ambrosini (2000, p.1) also argue from a dynamic capability perspective that "...a distinction needs to be made between useful value, which is subjectively assessed by customers, and exchange value, which is only realised at the point of sale..." To understand the concept of 'value' in RBV terms, the question of where value is determined is a key question. Scholarship in the RBV context asserts that value is only determined externally to the firm in the market in which it operates. This implies that value is only 'real' when customers make decisions based on that 'real' value. The findings of this study conclude that value creation is determined when a customer is prepared to pay a premium for a product or service because of the value-added benefits attached to it. In other words, a price advantage is not the sole criterion.

According to RBV Theory, value flows from resources with specific VRIO attributes (they are rare, inimitable, non-substitutable, etc.). Empirical studies in RBV have established direct causal links between a resource with the desired value-creating attributes. A deficiency of RBV is that there is no clear connection, nor traceability offered between the specific VRIO attributes, and the value created by the customer. The reason for the deficiency is twofold: (i) not enough research focus on SMEs, and (ii) the relational aspect of VRIO creation can be complex. This study has highlighted the relational aspect of value creation through boundary spanning, technical salespersons, and the customer. Moreover, the findings show that when a firm attains a competitive advantage, there is a bi-directional flow of value creation across the boundaries between firm and customer.

Closely associated with the determination and source of value is where value is created. The process of transforming resources into value should be a key concept in RBV, yet it has not been a focal point in any empirical research. It is accepted that resources are the source of value, and the firm must do something with the resources to create outputs that in turn, will be valued by customers. The findings show that, primarily, a customer-focused strategy is a necessary starting place. Knowing what specific value-generating resources customers prefer the most is where the journey to VRIO-ness begins. Likewise, the study shows that value creation through VRIO attributes is highly relational and that sustainable competitive advantage can be traced back to the co-creation of value with customers as stakeholders.

An important question integral to RQ3 is when value is identified. As the literature review concluded, the concept of 'value' is one of the two areas of ambiguity in the RBV. The other ambiguity, a definition of a 'resource' is overly perspective. Both concepts are closely linked together, and, perhaps for that reason, the origins of resources (and how they evolve) has received relatively scant attention in the RBV literature. The findings of this study suggested that they are closely intertwined as value creation evolves and changes with the evolution and changes in resources. In SMEs, where it is easier to research at the level of the individual worker, knowledge generation, and assimilation in the firm leads to resource development or reconfiguration of existing resources. This is a constant process influenced through boundary spanning, technical salespersons and the customer. The managerial agency is then charged with the tasks of operationalising and leveraging the market knowledge to create VRIO attributes to take advantage of opportunities.

The degree of resource specification is a fine-grained approach rather than a broad-stroked one that is favoured by RBV scholars. The result of the broad-stroked view is that there is no clear definition of a resource; instead, it is given a broad interpretation that is of little use in practice. Adopting the fine-grained approach is like the micro-foundations approach in the related dynamic capability theory. The findings show that resources are inter-relational and aggregate their specificity from different sources inside and outside the firm. Examples from Ukraine and Iceland described how inputs from all areas of specialisation in the firm were sought when innovations were being considered. The specifications required to drive a resource towards VRIO-ness is different for each market condition and situation. However, there are some critical attributes that a resource seeking to become a VRIO resource must address, for example:

- **the value** being created needs to revolve around product features.
- **the functional** attributes deemed valuable by the customer.
- the **benefits** of product ownership and how it can help teachers teach better science.
- develop a positive customer **attitude** to the product, the company, and/or the brand; and
- provide the possibility that new customers can join **networks** of users of the product.

The relational nature of resource building is an area that is neglected in the theoretical or empirical work in RBV literature. This significant gap in our understanding of how VRIO resources can be created, especially in SMEs. This study has shown that VRIO resources are often shared and developed through the careful combining, rebuilding or reconfiguring of existing resources and capabilities to deliver the value to the customer and then re-capture some value back to the firm. A contribution of this study is to encourage a new lens through which to address the formation of the VRIO resources and their connection to competitive advantage in SMEs. For example, the individual

VRIO value-added services and products are sufficient on their own to achieve a competitive advantage. Instead, they must be combined as a repertoire to achieve competitive advantage.

The output effects of resource configurations were manifested in several different ways in the findings. At the extreme end, the close relationship between the manager of the Slovakian firm was of seminal importance to the last-minute reversal of a tender decision in his favour. The size of the contract was such that 90% of schools in Slovakia were covered by the procurement competition and the winner was assured of sustainable competitive advantage for many years hence. This study used as a focal point customer engagement through boundary spanning and technical salespeople to determine the extent to which the mixing and combining of assets and capabilities produces the value-added attributes that cannot be easily copied by rivals. The measurable outputs are manifested through customer referrals and repeat orders from customers.

The debate supporting the static nature of the RBV is one of the most congested areas in strategic management literature. The emergence of the dynamic capability view was one such response to the deficiency of the RBV to account for competitive advantage in high-velocity markets. While a related construct, this study only nominally enters the domain of dynamic capability theory. However, the short encounter with the construct suggests that there is a place for both theories of the firm to co-exist together in some circumstances. For example, the study explicated conditions under which the firm was required to undertake a swift response to capture an opportunity that otherwise would be lost without urgent actions. In the findings, there were two examples from Holland and Slovakia that showed that firm was unexpectedly thrust into an environment that was in rapid flux. The micro-foundations of opportunity seeking capabilities was able to sense, seize and reconfigure to capture the opportunity before their rivals. The Dutch dealer seizing the opportunity to produce a STEM curriculum was perhaps the best example.

Marketplace heterogeneity and market information and uncertainty are closely related deficiencies of the RBV in the marketing domain. However, they are both linked to the attainment of competitive advantage. Marketplace heterogeneity relates to generating customer value in market niches can be by targeting different market segments and/or different competitors by leveraging different complementors. Although this study did not deal with this area in any depth, most of the case-study firms were focused on maintaining a strong presence in their niche markets. The concepts of segmentation, differentiation and positioning represent core elements of information-driven VRIO creation and execution in a niche market strategy.

Organisational learning does not receive much attention in the RBV, although it is recognised that intangible resources such as culture, knowledge and competencies can lead to competitive advantages. The RBV scholarship does not acknowledge that it is not tangible resources that guarantee customer value creation; it is how these resources are leveraged via the learning embedded

in capabilities/competencies in the firm. This study has found that the process of engaging directly with customers in developing new products and services and new ways of supporting customers provides an opportunity to learn that leads to knowledge discovery. The acquired knowledge, if correctly applied and absorbed by managers, leads to a competitive advantage through the VRIO resources and signature processes.

The customer value construct remains undefined in the RBV, and is a critical concept in RBV, and requires urgent conceptualisation. While RBV is unclear on what it means by customer value, an opportunity is lost in bringing the construct to a higher level. This study shows that value creation is a fluid process and passes back and forth between the customer and the firm. There is little point for a manager to invest in added value for their customers if that value is not returned in the form of increased (profitable) revenues downstream. Hence, the concept of co-creation of value has been proposed that situates the customer as part of a triad of value creation as detailed earlier in Figures 6.1 and the expanded version 6.2 regarding the dimensions of customer value.

RBV literature simply limits its conceptualisation of resources to being characterised by their VRIO-ness. There is no reference to the relational aspect of resources. Concerning SMEs, the quest for competitive advantage intimately depends on how VRIO resources combine is pivotal to understanding how competitive advantage is achieved. The findings show that resources on their own (whether VRIO or not) are not sufficient to influence competitive advantage. The relational aspect of resource interchange and bundling is a prerequisite to developing VRIO-ness and hence competitive advantage.

Table 6.3 summarises the contributions made in this study to the gaps in the literature identified in Chapter 2. Where applicable, the literature gaps identified by Kraaijenbrink et al. (2009, p.3), are retained because of their relevancy and supplemented with the findings of this study.

Table 6-3– Summary of gaps in RBV literature identified by Kraaijenbrink et al, (2009) with the additional findings of this study (Source: Adapted from Kraaijenbrink et al., 2009, p.3).

RBV issue	RBV literature/perspective	Relevancy to the study	The outcome of findings.
Where is value determined?	<p>“... Value determination is exogenous to RBV (occurs external to the firm in the marketplace)...” (Kraaijenbrink et al., 2009, p.3)</p> <p>RBV is unclear on how the value is determined in the firm and how it can be quantified and measured.</p>	<p>A clear understanding of the nature of value and how and where it is created is of high value to practitioners. A succinct definition of value characteristics is of use in the determination of the interdependence of resources within the VRIN/O framework.</p>	<p>This study is about how value can be created and re-captured through an externally focused customer-focussed strategy supported through boundary spanning.</p>
What is the source of value?	<p>“... Value flows from resources with specific attributes: they are rare, inimitable, non-substitutable, etc...” (Kraaijenbrink et al., 2009, p.3).</p> <p>RBV is unclear on the source of value and how it is linked to the resources that confer competitive advantage. Likewise, there is no further elaboration on a quantum of value. There are many unanswered questions – for example, are there different levels of value? Are there different classifications of value?</p>	<p>RBV does presume that there are direct links between VRIN/O resources with the required attributes that are needed for specific value creating opportunities. However, RBV makes no mention of how the attributed need to be managed or developed and to what extent there are relational.</p>	<p>The study shows that the source of value is not restricted to VRIO resources. It can also be developed through co-creation of value with the customers. Moreover, VRIO configurations are highly relational.</p>

RBV issue	RBV literature/perspective	Relevancy to the study	The outcome of findings.
How is value created?	<p>“...The process of transforming resources into value has not been a focal point in RBV...” (Kraaijenbrink et al., 2009, p.3)</p> <p>A critical element of the RBV’s competitive advantage is the development of VRIN/O resources, however, it is not clear how they combine to produce and deliver value.</p>	<p>Creating value, whether through product features, support or signature process is essential for an SME competing successfully against larger and better-resourced rivals. Hence, an understanding of creating value and capturing value back is critical to understand (at least in general terms),</p>	<p>Customer-focussed VRIO activities provide a hard to imitate and effective methods to build the most cost-effective VRIO resources.</p>
When is value identified?	<p>“...The origins of resources (and how they evolve) have received relatively scant attention in the RBV literature...” (Kraaijenbrink et al., 2009, p.3).</p> <p>Building on Kraaijenbrink et al., (2009) the lack of a micro-view in RBV is a major contributor to the lack of understanding of the path that is followed in generating value. There is no evidence in the literature that attempts to measure if value creation is a linear process or does value get created at defined points in time.</p>	<p>The creation of resources is fundamental to the entrepreneurial aspects of strategy development and execution.</p>	<p>Boundary spanning and technical salespeople working together closely with customers can gain a better understanding of the precise parts of the customer experience where value has its greatest impact. Accurate reporting back to the firm can help managers to focus more on elements of value that mean the most and neglecting the values of lessor standing.</p>

RBV issue	RBV literature/perspective	Relevancy to the study	The outcome of findings.
What is the degree of resource specification?	<p>“...Specification of resources tends to be broad-grained, rather than fine-grained...” ...” (Kraaijenbrink et al., 2009, p.3).</p> <p>Most notable is the absence of research in SMEs regarding resource configuration and development. A study focusing on resource building in SMEs is, by definition, going to offer more of a micro-view than that of the large organisation.</p>	<p>How are resources created at the micro-level? To what extent are resources at the micro-level relational with other resources? The extent resources need, or can, have specifications that make them industry unique.</p>	<p>Specificities developed through boundary spanning shows VRIO resource differ widely across different markets and contexts.</p>
To what extent are resource interaction effects pursued?	<p>Often noted, but not a distinctive focus of theoretical or empirical work...” (Kraaijenbrink et al., 2009, p.3).</p> <p>The literature synthesis failed to locate any empirical studies that adopt a fine-grained analysis of the commingling of resources to develop competitive advantage.</p>	<p>The study focuses on SMEs, so there is a necessary requirement for commingling interdependent resources.</p>	<p>Customer engagement through boundary spanning and technical salespeople by its very nature requires interdependence of resources internal and external to the firm. At the level of the SME, the level of commingling of resources often become blurred at the boundaries.</p>
Is RBV analysis static or dynamic?	<p>“...The analysis represented as dynamic. But, often, theoretical implications are drawn based on</p>	<p>The RBV recognises that competitive advantage cannot be permanent but can exist if there exist heterogenous organisations</p>	<p>Competitive advantage sought by SMEs in the science education market is difficult to develop using internal resources alone that</p>

RBV issue	RBV literature/perspective	Relevancy to the study	The outcome of findings.
	<p>the competitive equilibrium—i.e., static predictions...” (Kraaijenbrink et al., 2009, p.3).</p> <p>The debate about the static condition of the RBV has led to the divergent stream of the dynamic capability view. The RBV analysis of competitive advantage can be compared to a snapshot in time, that reports the static position at that point.</p>	<p>capable of developing VRIO resources. However, RBV implies that value creating resources are dependent on always satisfying all the four VRIO conditions to remain. This study is concerned with SMEs and boundary spanning activities can ensure that the correct mix of value-added resources remain VRIO compliant.</p>	<p>are not (at least) partially visible to larger rivals. Instead, a fine-grained focus on building extremely close working relationships with customers, helps the SME gain an accurate insight into what value-added attributes are valued the most.</p>
<p>Marketplace (demand and supply/resource) heterogeneity</p>	<p>“...Marketplace heterogeneities and uncertainties are recognised but have received limited attention in the RBV literature...” (Kraaijenbrink et al., 2009, p.3).</p> <p>The fuzzy boundaries between regeneration and reconfiguration of resources do not receive much attention in the RBV literature. Similarly, the RBV does not differentiate between different industries and makes no allowance for the influence of complementor or moderating factors that may</p>	<p>The more customer focussed the approach by a firm the more the potential for market niches to be created. RBV does not concern itself with the fact that market conditions can change quickly and that there may be numerous variants of VRIO resources required to maintain competitive advantage.</p>	<p>The creation and execution of VRIO resources supporting competitive advantage must be correctly aligned with the value-added attributes that are valued the most by the customer. These alignments are information-driven and must be executed and organised in a cost-efficient way, such that the return on the investment in the customer remains positive at all times.</p>

RBV issue	RBV literature/perspective	Relevancy to the study	The outcome of findings.
	appear periodically in periods of market change.		
Knowledge generation and dissemination for VRIN/O resource alignments	There are no mechanisms whereby information flows into the organisation are facilitated in the RBV, even though, it is an internally focussed theory.	The VRIO variant alludes to the importance of the correct organisation of resources. The RBV does not provide any insight into how that should happen.	Customer-focused orientation and boundary spanning activities are designed to generate important market knowledge that can be used to build competitive advantage. The study concludes that VRIO resources can also be constructed and exist outside of the firm through the agency of boundary spanners.
Organisation learning and knowledge building	<p>“...Intangible resources such as culture, knowledge and competencies can lead to competitive advantages...” (Kraaijenbrink et al., 2009, p.3).</p> <p>The RBV does not consider any resources that may sit outside of the firm that may be intangible in nature.</p>	The VRIO iteration of the original VRIN recognised the needs of the correct orchestration of resources as a condition of competitive advantage. The orchestration of resources needs to consider tangible and intangible and whether they are internal or external to the firm.	Engaging directly with customers in mutually beneficial value-added products are services is also a resource with VRIO characteristics. The study illustrated those loyal customers who engage in development of improved products or services are resources that are also essential but reside outside of the firm. The RBV theory should consider marking allowances for such complementary supportive resources in a more outwardly focussed stance.

RBV issue	RBV literature/perspective	Relevancy to the study	The outcome of findings.
Customer as a resource	The customer value construct remains undefined in the RBV. It, nevertheless, is a critical concept in RBV and requires conceptualisation.	The key dimensions of customer value are an example of an important concept that is left without much by way of empirical testing and further theoretical development in the RBV literature.	The co-creation of value has been shown that it can occur at the nexus of the customer, technical salesperson, and the boundary agent if there exists congruence in the same beliefs and values in science education.
How are resources bundled together?	The RBV literature limits its conceptualisation of resources to being characterised by their VRIO-ness. There is no reference to the relational aspect of resources.	When the focus is on SMEs, and their quest for competitive advantage, how VRIO resources combine is pivotal to understanding how competitive advantage is achieved.	The findings show that resources on their own (whether VRIO or not) are not sufficient to influence competitive advantage. The relational aspect of resource interchange and bundling is a prerequisite.

6.9 Overview of the Main Empirical Findings

The term ‘signature processes’ have been used intermittently throughout the study. It is used to emphasise that not all VRIO processes are identical to all firms. The case-study SMEs that are part of this study that managed to achieve a competitive advantage, did so by developing their own ‘brand’ of VRIO resources. While the end result is the same, the path travelled can differ considerably. Hence, through collating their repertoire of resources and packaging in a specific way to address the different heterogeneities of their markets, they develop a process that is distinctly theirs that supports the brand the SME is attempting to create. Hence the term ‘signature processes.

The knowledge accumulated through boundary spanning, if correctly codified and implemented, was shown to have a strong positive correlation with the development of VRIO ‘signature processes’. The development of signature processes takes time through a mechanism of sequenced adaptive learning (Argyris, 1982; Fainshmidt et al., 2016; Verona & Ravasi, 2003). However, the path is seldom linear and can be ad-hoc, according to circumstances. Teece (2014) refers to this as a path-breaking change in the environment, which necessitates the rapid change in direction for the firm. The literature suggests that learning is critical to the creation of resources and capabilities that can lead to VRIO-ness but is silent in how they are achieved. At the same time, the researcher acknowledges the complexity of explaining firm-level learning routines and capabilities, the direct relationship between boundary agent and the SME’s technical salesperson or manager cuts through many layers of complexity. The rapid deployment of value-added ‘signature processes’ lead directly to the important VRIO resources and capabilities.

The findings show that the relationship building between competent managers/technical salespersons and boundary agents mediates the operationalisation of knowledge generated. The competent manager should critically evaluate the knowledge gathered and operationalise it effectively, precisely and rapidly. The challenge then remains to continue to foster creativity and innovation amongst the co-workers through tracking ideas while cognisant of the need for ambidexterity. The creation of value-added resources must be systematic, fluid and sustainable. Ideally, the signature processes operationalising the capabilities must satisfy the conditions of VRIO and, where possible, be also causally ambiguous to rivals. Being able to orchestrate all of these factors in the correct mix and sequence leads to sustained competitive advantage. The importance of managerial agency and the many different roles performed in an SME was evident from the findings. The research found congruence with the literature about the entrepreneurial nature of the firm and its managers in the empirical literature as an important contributor to SCA (Arend, 2014; Barringer & Bluedorn, 1999; Jantunen, Puumalainen, Saarenketo, & Kyläheiko, 2005; Macpherson et al., 2015; Steiber & Alänge, 2016; Teece, 2012, 2016b). However, an important distinction must be made in focusing the attention

on the SME sector. As mentioned above, SMEs lack the financial depth to access critical market knowledge, where larger organisations possess the necessary resources through marketing departments, large sales departments or political contacts. Thus, competitive advantage must be attained through asset alignment capabilities across boundaries that support the managers in the SME. Therefore, added valued resources capabilities are a fusion between those of the boundary agents, the customer and the manager/technical salesperson to develop a coordinated VRIO inspired competitive advantage.

Knowledge integration is part of KAM, and to integrate the knowledge, the firm must first procure it. In the SME where financial resources are often scarce, forming boundary spanning alliances that are low cost, is an effective way to achieve this. The findings showed that knowledge generation by boundary agents' directed workshops was the most valuable by far. In the environment of a host school, workshops are conducted in a relaxed atmosphere, and customers freely exchange ideas and comments about rival suppliers. Several case-companies confirmed that suggestions were offered by customers in workshops regarding improvements to products and important capabilities of rivals. A critical capability the SME must develop in congruence with the knowledge inputs from the boundary agent is adaptive learning capabilities. Therefore, it was not surprising to discover the degree to which boundary agents are involved in the decision-making of the firm directly influences the rate of formation of higher-order capabilities as sequenced re-configurations of established adaptive learning routines.

The study sheds new light on how SMEs identify through boundary agents the need for change. Building on the value-added routines developed by the firm is the requirement to develop or maintain customer intimacy. At the level of the SME, there is a profound need for the firm to develop and maintain asset alignment capabilities with boundary agents. In so doing, there is a combination of assets that continue to deliver added value to customers. The extensive network of boundary agents in several of the case-study companies facilitated the level of intimacy with customers because the firm assimilated the credibility of the boundary themselves.

The research shows that adaptive learning capabilities combined with boundary-spanning knowledge generation are a necessary precursor VRIO signature processes and resources. It was not surprising for the researcher to discover the degree to which boundary agents are involved in the decision-making of the firm, and how directly they can influence VRIO practises the sequential building of routines and capabilities depends as much on boundary agent-manager relationship as it does on experiential learning and KAM. This research was carried out during the recent economic turmoil, and so the importance of the boundary agent-manager decision making becomes a pivotal part of building the *correct* resources for them to attain the VRIO status.

6.9.1 Competitive Advantage

Referring back to the definitions stated previously (section 2.3) competitive advantage and superior performance is correlated to the resources of the firm (Christensen & Fahey, 1984). Also, consolidating the writings of King (2007) earlier, it is reasonable to consider inter-firm causal ambiguity regarding resources will generate a competitive advantage at a sustainable level. The concept of causal ambiguity underlines the concept of signature processes. Figures 6.2 and 6.3 above describe the relational competencies and capabilities that underpin the development of signature VRIO processes and are not readily visible to rivals and hence not easy to imitate, or substitute.

Further, it explains the fine-grained nature of resource development and the intimacy of the knowledge and understanding necessary for competitors to appreciate which resources underlie superior performance. Moreover, an understanding of which combinations of resources and in what ways develop and capture the value to and from the market, is critical. The extent and strength of the inter-firm causal ambiguity will determine the sustainability strength and sustainability of competitive advantage.

Should a rival be unable to overcome the inter-firm causal ambiguity, this does not necessarily result in them imitating resources. Even if a rival is able to recognise their competitors' VRIO resources, they may still not be able to imitate them due to the complex social relationships with customers, or because there is no other viable alternative to pursue (Johnson, Scholes, & Whittington, 2008; Joseph T. Mahoney, 2001; Joseph T Mahoney & Pandian, 1992). Certain resources, like company reputation, are path-dependent and are accumulated over time, and a rival may not be able to perfectly imitate such resources (Kogut & Zander, 1996; Zander & Zander, 2005).

Competitive advantage is at the heart of the strategic management literature, and many theories try to explain how it can be achieved – internally (RBV, dynamic capabilities) and externally focussed (Porter's prescriptive approach to strategy formulation). The literature on all sides of the scholarly divide fails to reach a consensus on what exactly is meant by competitive advantage. Since the study adopted the RBV as the main theoretical lens, Barney's (2001) definition guided the conceptualisation of competitive advantage:

"...when [a firm] is able to implement a value-creating strategy not simultaneously being implemented by any current or potential competitors..." (p.102).

The definition, in itself, alludes to the mere fact that competitive advantage is transitional and only holds while the same value-creating strategy is not offered by anyone else. Given that strategic resources represent a complex network of inter-related assets, resources and capabilities, firms can adopt many possible competitive positions, and all claim an advantage of sorts. The overarching

conclusion from the study is that competitive advantage and, indeed sustainable competitive advantage, is achievable over the longer term, but that is finite. In the example given by Slovakia, where a countrywide tender was overturned at the 11th hour due to the intervention of an influential boundary agent, the competitive advantage of a somewhat rare influence is only useful while that boundary agent remains influential.

Returning sustained competitive advantage, it is the market position that can only be attained by one firm at a time. By definition, achieving the position of sustained competitive advantage will result in value been returned to the firm in higher-than-average industry profits (rents), because customers are 'locked-in' to the brand, the network system, or because the product is standardised across the entire market.

Finally, the definition of competitive advantage from an ontological perspective needs further clarification. Competitive advantage from the perspective of one firm may be different from a rival firm in the same market. While one firm may deem a superior market-share obtained through cost leadership strategies and hence lower than average market profits, to have attained a competitive advantage over its rivals. Whereas another firm may be content with a lower market share but enjoy profits that are higher than the industry average. To which situation can the casual observer ascribe the firm in the position of competitive advantage. The busy fool who prefers the vanity of turnover, or the rival who consider profit as sanity, not vanity?

6.10 Summary of Chapter

The mediation of boundary agents is suggested as being pivotal in firms' ability to engage in exploitative learning and hence cost-effectively add value for their customers. Accordingly, the findings show that such learning derives from real-time through knowledge generation within, or from outside the firm through boundary agents' activities. This finds congruence with Eisenhardt and Martin (2000). They recognise that routines that support VRIO resource or dynamic capabilities development must be aligned with real-time knowledge creation and be general. The reason for the generality of supporting routines is to ensure that managerial attention is not focused on past experiences and hence become core-rigidities (Leonard-Barton, 1992). All of the multiple case-study SMEs agreed that customers are more relaxed in a workshop setting and converse freely about the product, competitor activities, and their opinions about the supplier. This is essential knowledge that can be codified and returned to the SME to develop or reconfigure crucial capabilities. The generation of critical market knowledge is also economical to achieve.

The most specialised and value-added the SME are the less likely they will have to compete on price only. The ultimate goal is thus to increase proximity to the customer and deliver value which to a high degree heterogeneous and with the VRIO characteristics to lead to competitive advantage. Five of the SMEs in the multi-case study admitted to having a group of 'evangelist' customers, who brought it upon themselves to organise local workshops demonstrating dataloggers to their colleagues across their local geographic regions. The typical profile of the 'evangelist' customer would have a close relationship with a particular boundary agent, are competent and are happy to set up local networked groups.

Adding value for customers was described by all respondents as a critical success factor that also must be cost-effective for the firm. Eight of the respondents cited VRIO added-value activities supported by customer-centric processes to be a key attribute that was hard to imitate. In the literature, Hoopes et al. (2003) point out that value and inimitability are the essential constituents of VRIO, so "adding value" by the SMEs was so vital that it permeated almost all of their operational routines.

The findings also reveal that for the majority of the multiple case-study SMEs their ability to capture value from the customer was dependent on the integration of their products and services to be as closely aligned to the customer needs as possible. Additionally, the firm's ability to adopt diversification strategies, alliance and cooperation strategies built on a positional strategy that relies on organisational architectures that facilitate the skill required to challenge rivals. Katkalo et al. (2010, p. 1180) refer to "...positional strategy architectures..." as a means to build generic strategies to underpin more specialised ones to compete against rivals agrees with the findings of this study.

Added-value capabilities are not something that comes naturally to the SME, as the findings concluded. As recognised by Laaksonen & Peltoniemi (2016), prior experience (path dependency) is required for accumulating and knowing what resources to invest in are essential over time. The findings show that the nascent distributors tended to rely on their relationship with the supplier and boundary agents more than the more established distributors. The findings were similar to that of Tallott and Hilliard (2016, p.3) in their ten-year study of an Irish SME, which concluded that the ability to change is “... created through path-dependent learning...this process underpins the purposeful or deliberate creation, extension or modification of a firm’s resource base....” Hence, developing and knowing heterogenous cost-effective value-added services to offer is a critical success factor against rivals who cannot provide similar value-added services at the same cost.

Developing and maintaining values added VRIO processes in the data logging niche market needs key employees to be above a threshold of technical competence. In all but three case-companies, key employees possessed a science qualification to at least first-degree level. As Alegre et al. (2013) point out, firms differ in their ability to learn from their experience and improve performance, meaning that rivals who are non-specialised general science educational suppliers are unlikely to develop competencies in a niche market. Thus, managers must possess an adequate disciplinary knowledge domain to be able to integrate and use the knowledge gained effectively and decode the feedback from boundary agents. This has been recognised by Carlile (2004) overcoming the linguistic barriers (syntactic, semantic, and pragmatic). Accordingly, the SME can attain a competitive advantage in that niche market segment with supernormal profits against larger rivals.

The majority of respondents recognised that effective asset orchestration depends on a particular skill set and the division of responsibility applied within the firm. If orchestrated correctly, the resulting capabilities create a culture of change that results in the SME’s ability to achieve new and innovative forms of competitive advantage. Leonard-Barton (1992) suggests that such capabilities are predicated on current market positions and path dependencies. However, the findings of this research indicate that those two conditions are not at all exclusive, where respected boundary agents can considerably shorten the time required to establish the firm’s reputation. Of course, the product must be ‘fit for purpose’, such as product quality, innovation, price and technical support; otherwise, no organisation can achieve a sustainable market position. The findings show that there are many latent factors that are also complementary to customer support and boundary agent interventions.

What makes one SME more successful than another operating in the same industry, but in different regions? The initial pilot study between the dealers suggested that they viewed boundary agents as an integral part of their marketing activities but would still feel that the firm needs professional sales and marketing employees as well. In the light of dynamic capability theory, this is not at all

surprising. The distributor must possess, at least, threshold capabilities and resources to participate in the market.

The study has shown that the deployment of boundary agents can be part of an overall strategy that is concerned with matching a firm's resources and capabilities to the opportunities that arise in the external environment, a view shared by Grant & Jordan (2012; 2010). The findings confirm that boundary agents play an active role in reviving, reconfiguring, and discarding established processes that no longer generate value in response to new knowledge gained through interaction with customers. Managers of more successful case-study SMEs recognise the role of the boundary agent as being able to bring valuable knowledge to the enterprise that can influence the renewal and development of the necessary value-generating resources. In so doing, potential VRIO processes develop that morph into highly customer-centric resources and can lead to competitive advantage. The real benefit is developing signature processes in that they are "custom made" for the SME, and the firm's agility underpins their operationalisation. A causal ambiguity that rivals would find this difficult to implement, even if they were able to copy it. This resonates with the notion of *competitive repertoires* suggested by Miller and Chen (1996, p. 1210), as a concept consisting of "...the entire set of market-orientated actions used by individual firms to attract customers and cope with rivals..."

While boundary agents cannot exclusively account for sustained competitive advantage in the local marketplace, they are nevertheless significant contributors to the value-added resources generated in the firm. Most of the case-study firms that took part in the study had additional products ranges in their portfolio, in addition to data-logging instruments. Some case-study SMEs were general science educational suppliers supplying a complete spectrum, while others concentrated on niche areas of education in particular. In the non-technical aspects of the local dealer's product ranges, no boundary agent support was used. Instead, the firm relied on its prior reputation to sell the traditional science products using only their professional sales teams. Of the case-study SMEs those firms that actively used boundary agents more often reported a higher increase in sales. The two case-study SMEs who did not actively engage boundary agents were significantly below-expected sales levels for their host markets.

To a certain degree, path dependency plays a role in the success of the market and the prior history of the company goes some way to supporting this, resonating with the views of Helfat et al. (2007), and Teece et al. (1997). The established literature is in agreement that the future direction of a firm is very much dependent on the previous paths it has travelled Helfat et al. (2007). This study questions the rigidity of the path dependency in SMEs approach as a precursor to VRIO resource, or dynamic capability development but takes the view that the development is more fluid. The findings also conclude that VRIO resources are underpinned by more than just antecedent factors posited necessary for sustained competitive advantage. The findings are clear, that where an SME is prepared

to engage freely and enthusiastically with a boundary agent, the condition of path dependency can be circumvented.

The findings of this study are thus more sympathetic to Miller (2003) and his scepticism around the necessity to rigidly enforce path dependencies to sustain a competitive advantage in the market. This is particularly the case in the case of the SME, which must be nimble because it does not, and could never, exert a strong influence over market conditions. This is certainly true in the new modern science supplies market, due to the nature of the rapid changes in technology available for teaching science. As the study has shown, the case-company SME will have to react and rapidly change its capabilities in response to rapid changes and unique customer requirements. Barney (1986) recognised that while non-specific knowledge can sometimes be procured through 'strategic factor markets' (Barney, 1986), the specific knowledge sometimes required cannot and is indeed the case for specific knowledge in a niche market where the role of the boundary agent is pivotal.

It is also evident from the study that firms only with specific experience as suppliers of consumable and standard products (chemicals, microscopes, glassware etc.) can and do, succeed over the long term, and can have a definite advantage in a competitive market (Dierickx & Cool, 1989; Dosi & Nelson, 1994). However, eventually, the firms that supply only low technology products will have to resort to a cost leadership strategy to maintain a competitive advantage. The SME cannot compete in this environment, so must exploit technical weaknesses in the larger rivals. The study confirms that by focussing on the technology niche market segment of the market with the help of external experts, the SME can enjoy a sustainable competitive advantage against its larger rivals.

As the relative value of each of these routines is increased for the customer, they morph into the all-important VRIO resources. At this stage, the firm enjoys sustained competitive advantage until its competitors find a way to compete against them. Unless the customers are "locked-in" because of countywide tenders or because of the deep embeddedness in the curriculum (for example, Finland, Slovakia and Turkey), the competitive advantage gained cannot be considered sustainable over the long term.

If competitive advantage is considered to be a temporary advantage, the process starts again, and the renewing inputs of boundary agents continue once more. So competitive advantage is dynamic. It is not a one-off occurrence but rather a strategic state of mind which has to be inbuilt into how a company operates. Arguably it is these types of companies who will sustain competitive advantage. It should be noted that competitive advantage should be viewed regarding the strategic goals of the firm involved and it does not necessarily involve overall market leadership. For example, in the PC1 the firm is not interested in competing against lower cost, lower quality domestic data-logging manufacturers, but instead, focuses on the fee-paying secondary schools and universities where supernormal profits are easier to obtain.

Inter-relationships between different workers in the firm can determine whether asset orchestration will operationalise or not. Since Grant and Jordan (2012) conclude that the competitive advantage of a firm lies primarily in the application of a bundle of valuable, tangible or intangible resources at the firm's disposal, cooperation by employees is a prerequisite condition. The majority of the CEOs interviewed conceded that developing the right culture and getting “buy-in” was a necessary precondition to agility, innovation and capability building on the firm. The SMEs interviewed viewed their senior managers as having pivotal roles to play. In congruence with Day (1994), key individuals (usually managers) who have developed superior skills not available to rival firms, represent an essential and primary source of competitive advantage allowing the SME to outperform larger, better resourced, rivals. Thus, Figure 6.1 earlier expands with a little more complexity to Figure 6.2 below. The diagram summarises the main result of the findings in terms of identifying how value is created in SMEs and then captured back as superior profits and locking customers into their products over long periods.

Figure 6.2 conceptualises the value captured from the customer could include important market intelligence about impending changes at the Ministry of Education or national curriculum levels. Examples at the extreme included “tip-offs” where unscrupulous rivals unfairly manipulated large countrywide tenders. If the governments' tenders had proceeded to the conclusion without challenges to their manifest errors, the firm would have been ‘locked-out’ of the market for a considerable period. While the firms in Ukraine, Slovakia and Turkey are happy that the practices are reported in general terms, the finer details of how the boundary agents supported the firm, must remain confidential. The co-creation of value is also on a more mundane level, where constructive comments are given on products and the levels of localisation. Several of the firms have a practice of donating new equipment released to the market are given to customers to use in their classrooms, and feedback passed to the firm. In several cases, especially in the UK, customers comment on their blog pages, and in some instances, submit a paper to academic journals or professional magazines. However, the real value is captured when the customer prefers to deal with the firm and is not swayed by aggressive pricing from their rivals. Hence, it is seldom the case that case-study firms have to win business by discounting. The technical salesperson, as concluded from the literature, was the more effective when the products were of a non-commodity nature (L. Ryals, 2005; L. J. Ryals & Davies, 2010; L. J. Ryals & Holt, 2007). The Dutch firm would not use their non-technical sales staff to engage with potential data-logging customers. At the intersection of the customer and the technical salesperson, both share a passion for the attributes of the products. The technical salesperson enthuses about the features, while the customer sees those features as enhancing their practice. A congruence is established, but for different reasons, so a potential value is created if the customer purchases or engages by passing on knowledge or referrals to colleagues. The intersection between the technical salesperson and the boundary agent is characterised by a shared identity with the products and the

common goal to help teach better science. The boundary agent is an independent value creator as the direct interface with the customer on the same level. All of the firms reported that boundary agents have a direct input into the configuration of resources to develop VRIO were possible. The nexus of the boundary agent is pivotal to the triad of actors in that engages potential customers in a participatory workshop and create a sense of network with many other users. These findings are consistent with Keller (1993) and P Kotler and Armstrong (2013), being part of a **network** of users as being four core dimensions of customer value has benefits in terms of support from colleagues locally and nationally.

Levitt (1960) recognised the importance of customer satisfaction, while Galbraith (2011) highlights the importance of customer-centric firms to ensure customer satisfaction is maintained. Such firms look to leverage superior economic performance through meeting customers' demands in the best way possible and minimise customer churn. At the centre of the Venn diagram is the value co-creation, which shows that all three stakeholders have the same goal, that of teaching science better. When this equilibrium is achieved, the firm is then able to extract the 'value' back from the customer. The result is "...superior (including financial) resources that can nurture market-based assets and capabilities in the future..." (Srivastava et al., 2001, p. 2), and under the right conditions, sustainable competitive advantage.

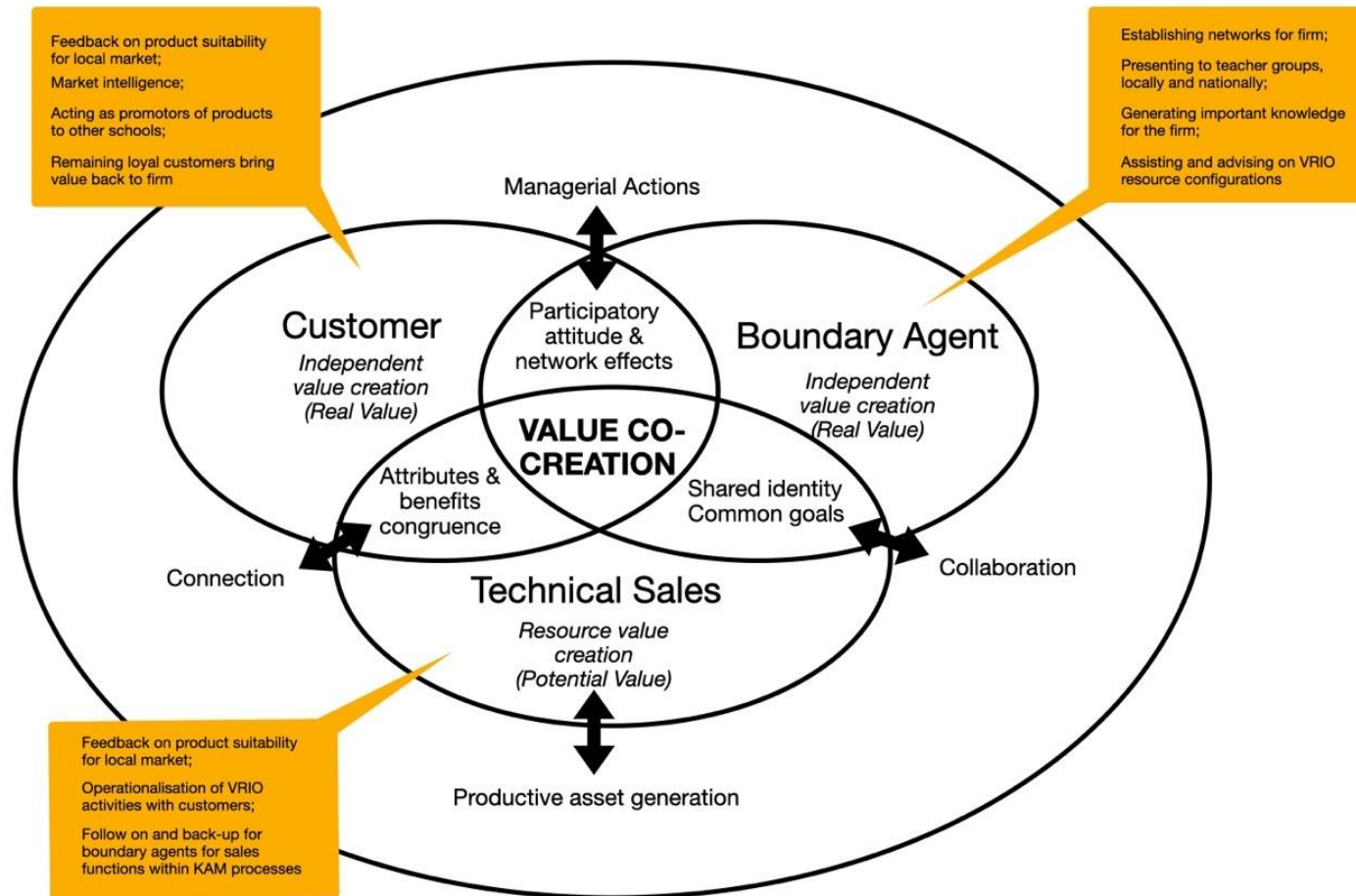


Figure 6-2- Expanded value co-creation model

7 Conclusion

7.1 Introduction

In this final chapter, we review the success in meeting the original aims and look at how the research contributes to theory. The quality of the research is critically assessed, and the implications of some of the inevitable limitations associated with the methodological choices and practical considerations are examined. The original purpose of the study centred on the exploration of VRIO resource development and competitive advantage in SMEs operating in a niche science education market in Europe. The study endeavoured to develop a VRIO model linking the key variables leading to competitive advantage from KM, KAM, RBV and boundary-spanning. The research was operationalised through the three RQs that sought to explain competitive advantage through the different streams of the literature.

The study links the scholarly domains of boundary spanning, the knowledge-based view and the RBV and suggests a new approach and interpretation of value creation and resource configuration is timely for the RBV. To date, the RBV is positioned at the macro-level, and it has not been applied with much enthusiasm at the micro-level. This study has identified that RBV is an important and useful framework. However, its shortcoming in elucidating what and where value is created, and the true nature of resources has been highlighted. Also, the applicability of the RBV framework on a practical level for SMEs is shown to be deficient. Therefore, the study contributed to the field an acknowledgement that empirical research at the SME level adds substantially to the understanding of the RBV field in terms of value creation and capture. Moreover, the study contributes to a new way to view the RBV in terms of using complementary constructs to aid in the understanding of the RBV in more practical terms.

The analysis demonstrates that SMEs can attain a competitive advantage against bigger and better-resourced rivals by building ‘signature VRIO processes’ through the help of carefully selected boundary agents in partnership with technically competent internal staff. Through careful development and nurturing, a wider network of boundary agents can be developed which, in turn, can lead to ‘evangelical customers’ as one method of attaining sustainable competitive advantage. The findings show that the firm is able to sustain this high level of customer engagement through little or no cost replacing the need for expensive marketing programmes or teams of sales professionals, as used by larger and better-resourced rivals. Therefore, supernormal profits are achieved, and the SME moves away from cost leadership

wars it cannot possibly win. This chapter outlines the significance of these findings in the science education market and the potential impact on other niche technology-oriented markets involving SMEs and reflects on the researcher's journey while outlining the limitations of the research.

The research set out as one of its keys aims to understand better where value is created in the firm and how it is eventually captured (RQ3). The conclusions from the literature showed that the lack of conceptualisation and definition of 'value' was a serious deficit in the RBV Theory. Moreover, the lack of clarity on what is a 'resource' only compounded the lack of practical applicability of the RBV in a managerial context. Since the RBV is founded on 'value' and 'resources', the RBV Theory hence lacks teeth. The findings of this study go a long way towards quantifying and conceptualising 'value' by identifying where it is created and what form it takes. Moreover, the study recognises and emphasises that value-creation alone is not enough.

The link between competitive advantage and value-creation-capture is demonstrated in the different methods employed by the diverse case-study SMEs. The commonality of the engagement of boundary-spanners laying the foundations of the VRIO resources is also acknowledged.

The theoretical and practical contributions to knowledge from this study are now expanded on a little further in 7.2.

The following important conclusions emerging from this study are summarised as follows:

- First, the current conceptualisation of VRIO resources in terms of their relational structure has been subject to unnecessary ontological ambiguity in the RBV literature.
- Second, the effects of routine and deliberate learning in SMEs result in different outcomes in value creation and value capture.
- Third, the managerial agency and the knowledge accumulation through boundary spanning is a critically effective mechanism to help an SME develop important VRIO resources.
- Fourth, the study concluded that VRIO resources are not irreducible to, but overlap and are interrelated, and thus should not be ignored in the RBV literature.
- Fifth, where VRIO resources lead to competitive advantage in SMEs, they must be supported by an infrastructure of the lower order VRIO resources.
- Sixth, value creation and capture are separate entities that cannot always be defined in simple monetary terms. The findings show that they are related entities, although distinct in their own right. The conclusion from the research is also that value capture

back to the firm in higher profits, or long-term loyal customers are supported through the correctly configured VRIO resources.

- Seventh, from a theoretical perspective, this study is the first to merge constructs of KM, KAM and boundary-spanning with the RBV (and a lesser extent, dynamic capability theory).
- Eighth, the study shows that the RBV can be practically grounded if a clear and precise identification of ‘value’ and ‘resources’ are available.
- Finally, the research brings the focus back on SMEs and shows the need for a much higher level of empirical engagement in this area.

From the foregoing, it can be concluded that the theoretical and practical contribution of this study is important. From a theoretical perspective, the study has shown that the concept of value creation suffers from unnecessary ontological and epistemological difficulties in the literature. The study provides an exhaustive analysis of the prior literature at the nexus of the RBV theory, KAM, KM and boundary spanning providing a rigorous empirical validation of VRIO resource generation and its execution. The study has also shown that the creation of VRIO resources and capabilities are relational and cannot be researched in isolation without the reliance on other paradigms (for example, marketing, sales management, knowledge capabilities and dynamic capabilities).

From a practical point of view, the empirically developed final conceptual model previously discussed in Figure 5.1 offers a much-needed alternative view for the academic community that includes more holistic dimensionality than have previously been applied to the RBV theory. Using the conceptual model, it is hoped that researchers will be able to measure the involvement of boundary spanning in the phases of acquisition, assimilation, transformation and exploitation of new knowledge and how that can progress to sustainable competitive advantage.

In light of the conclusions of the study, the following discusses the contributions to knowledge from this study from both theoretical and practical perspectives.

7.1.1 Theoretical contribution from Study

This study has made six key theoretical contributions to an understanding of the RBV in the context of the SME:

- First, this study has addressed the lack of parameterisation of ‘value’ (as highlighted by Priem & Butler, 2001a) by establishing the key dimensions of customer value in an

RBV context. The research has identified what resources are valuable and when they are valuable, and under what conditions. The need to address the "...the value of resources with theoretical tools that specify the market conditions under which different resources will and will not be valuable..." (Barney, 2001, p. 43) has been elucidated in the context of the SME in this study. In this respect, the different market conditions across 13 different countries have provided examples of how different firm resources acting under different conditions can generate a competitive advantage for the firm.

- Second, the study illuminates how and where value can be generated for the customer and captured for the firm. The study intertwines the sources of value creation internal and external to the firm and builds a connection with boundary spanning, technical salespersons and the customer in a novel approach to value co-creation.
- Third, the study highlights the need to disaggregate the concept of resources into a hierarchy of different levels of VRIO effectiveness. The study proposes that 'distinct' VRIO resources are sufficient for the firm to remain in the market and enjoy a temporary competitive advantage from time to time. Sustainable competitive advantage is possible only when a higher level of 'signature' VRIO resources are developed that are supported by superior value creation to the customer not available from rivals. The signature VRIO processes become synonymous with the firm's brand that is focused on a customer-centric philosophy. If the superior value creation becomes causally ambiguous and provides a value that is such that the customer comes to depend on, a market position is achieved that 'locks-in' the customer over a period of time. In the examples given in this study, the investment in the technology by the school once committed, ties all future spending to that product over several years into the future. Hence, will the firm be locked-in, its rivals are locked-out for a long period from that market. Accordingly, there is no question of sustainable competitive advantage being determined only on price.
- Fourth, the study has looked outside of the rigidity of the RBV framework towards the domains of knowledge management, boundary spanning and the utility of the specialist technical salesperson (with a key account management scenario). Moreover, by adopting a customer-focus approach, the research has placed the customer centre stage and shows that competitive advantage begins with customer value. The sequence moves to determine resource requirements that necessitate the creation of VRIO

attributes that positions the firm as an indispensable partner in the teaching of science in schools. The supplier now becomes a partner with the customer to achieve a common goal of teaching better science.

- Fifthly, this study has shown that the RBV would have more utility as a theory if it allows managers to identify resources and capabilities *a priori*. Priem and Butler (2001a) highlight the persistent criticisms of the RBV, where it all too often, identify *a posteriori* the existence of valuable resources after a study of a success story. Hence, the sequence needs to be reversed, with an approach that commences with customer value and then builds the required distinctive resources and capabilities needed. The study has shown VRIO resources and capabilities can be evaluated in a structured way. The research has also shown that the relationships between the VRIO resources can also be identified. Moreover, if a determination of the value-added to the service of product that is most important to the customer is also known, the model can be reverse engineered back from the customer to the fundamental VRIO resources.
- Finally, the study has shown VRIO resource and capability building, even at its most basic level, is subject to multi-domain relational influences. Theoretically, the concepts of ‘value’ and ‘resources’ has been poorly defined. This study shows that value-added resources are an ontological phenomenon capable of being interpreted differently by different observers. Accordingly, different ontological interpretations lead to different epistemological approaches by managers.

7.1.2 Practical contribution

The criticisms levelled at the RBV theory is that it is not easily understood or operationalised by organisations. The literature review concluded that the theory was too abstract with no clear guidance of what constitutes a ‘value’ or a ‘resource’. The literature review highlighted several inadequacies and shortcoming of the RBV, specifically in SMEs. Thus, a crucial stream of conceptual explanatory mechanisms remains unexplored, particularly at the level of the SME.

From a practical standpoint, all organisations want to know what they must do to attain a competitive advantage. The SME is more focused on the competitive advantage at a more fundamental level than its larger competitors. Accordingly, with that in mind, the final conceptual model (Fig 5.1) is as theoretical as it is practical. The final conceptual highlights new insights into the form and function of VRIO-laden resources and thereby makes contributions to practice in the following ways:

- Boundary spanning activities are a cost-effective and efficient method by which SMEs can gather essential market knowledge on which to build critical value-added resources and capabilities.
- The closer the integration with boundary agents the rapid is the development of signature processes that underpin VRIO capabilities that lead to sustainable competitive advantage.
- The study points the way to an alternative view of VRIO resource formation through the lens of the SME that views that concludes that VRIO resource build and configuration is highly relational.
- To sustain competitive advantage over the long term and against larger, better-resourced rivals, requires carefully crafted signature VRIO processes that have been developed over time.
- The business model employed using specific boundary agents with close and personal relationships with manager/owners applies to any SME operating in technical market niches competing for competitive advantage against larger rivals.

Notwithstanding the limitations of the research (discussed in the following section), it is believed that the conclusions drawn from this research give a novel insight into how VRIO resources can be created in the smaller SMEs operating in the science education market. It was found that boundary agents are essential contributors to learning capabilities and the subsequent development of important capabilities. The study also demonstrates that the direct and simple approach to introducing a technical product to the customer is to offer hands-on workshops. By putting the product and customer in a familiar environment moderated by a competent representative of the firm (the boundary agent), the relevancy, and usefulness of the product is much more easily demonstrated.

7.2 Research Limitations

In this section, we review the success in meeting the original aims and look at how the research contributes to theory. The quality of the research is critically assessed, and the implications of some of the inevitable limitations associated with the methodological choices and practical considerations are examined.

Whilst the study seeks to contribute the broader literature on RBV. In cases, the dynamic capabilities view, it is recognised that the multi-case study is very specific in an industry context. Moreover, the case-study companies were all SMEs and, so, a further limitation can

be levelled against the broader application of the research. However, critical realism posits that humans are capable of learning objectively about the world; there is no reason why the findings in this study contribute to the literature with caveats around the specificity of the context. For example, 'value' is the same no matter what industry or organisational size from a customer's point of view. Similarly, 'value' captured back by the firm is still represented in the same way in the form of market share capture, profits or low customer churn regardless of the size of the firm or industry it operates in. At the very least, the study has provided an empirical challenge to both RBV and dynamic capabilities theory as it is currently articulate and has challenged the construct to view value and resources differently.

Since the local host market dealers are all known professionally to the researcher, the responses to the interview questions may have been influenced by what they considered being the "right" answer regarding their dealership agreements, or bias responding. The potential was recognised in section 4.5.9 in a thorough reflection on the participatory element of the, and the hope was the rigour built into the research design that would counter any bias. It should also be remembered that the researcher did not have intimate involvement with the case-study firms, nor had any influence on the management of the firms.

The study was carried out in the specialised market of the science supplier. Within this market, there exists another niche market, that of the data-logging supplier. The data-logging is highly specific with its own specific needs of the customers. To convince technophobic teachers to use the new technologies as part of their day-to-day teaching is a challenge. Thus, the inclusion of boundary-spanning individuals who are also themselves teachers places a further limitation on the study for a wider application. However, parallels can be drawn with any technology-centric market that involves business to the business sales approach.

Since the firms, the managers and their employees were known to the researcher before the study, the participants were free and open with confidential information. Specifically, shared information included methods of building signature processes, how information was reported back to them on corrupt practises, and specific marketing techniques perfected for their local markets. The researcher was not able to share commercially sensitive information, except to use it to formulate conclusions. The researcher is in total agreement with the case-study firms and values their friendship and trust above all else, but at the same time, acknowledge that the exclusion of incredibly innovative processes and capabilities would have added significantly to the study.

There is always a danger that a conversational style of interviewing can be less about accessing the participants' reality and more about offering a way of constructing a shared sense of experience (Cunliffe, 2002, p. 136). This is acknowledged in the interpretation of the findings,

and triangulation with the exploratory pilot study was an important guide in this respect. The pilot study was composed of data taken from the customers only. In instances where further clarifications were needed, the second round of interviews was used to explicate a clearer understanding of some of the important aspects of the research.

Consideration was given to employing independent interviewers to conduct the semi-structured interviews. A choice between achieving the best balance between the objectivity of a third-party data collection and the risk of the loss of richness of data collection guided the final methodological decision. Quite apart from the prohibitive costs of sending interviewers to 13 different countries, the choice of a richer data collection by the researcher prevailed.

From a personal perspective, the researcher feels that he has been as independent, and objective as could be possible. The abductive approach was specifically chosen so that retroductive reasoning and thinking it is a form of logical reasoning. Although abduction and retroduction are not the exact equivalents, a retroductive element to the interpretation of the findings does help to mitigate against the abductive principle of the "best available" or "most likely" explanations when arriving at conclusions to the research.

7.3 Further Areas for Research

The RBV was the primary lens through which the research and subsequent evaluations were conducted. The findings reveal that a crucial research imperative must commit to a more rigorous and systematic identification of precisely where and how value is created across a broader range of industries. To achieve this, there is an urgent need to add more empirical research using more case-rich methodologies as advised by Eisenhardt (1989).

In a related way, the need to understand how tacit customer knowledge through close customer relationships gives rise to distinctive value-added customer benefits. Similarly, how knowledge gained through close customer contacts is used to influence resource configuration decisions by managers is also a deficit in the RBV theory.

During this research project, the researcher was unable to find any empirical studies that looked at co-creation of value that involved the generation of value outside of the firm through joint ventures, strategic partnerships, or boundary-spanning activities as cross-cultural case studies in MNCs, SMEs or larger firms (not MNCs). Therefore, there is an urgent need to address this area, as value is a central tenet of the RBV theory.

The RBV does not address the reason why some firms and not others are more likely to attain a competitive advantage in some emerging markets, while others are not. Additionally, how can the RBV explain why some firms are more likely to create distinctly new marketplace opportunities than others.

Finally, there is little attention given to relating how changes in the market environment directly relate to changes in resource rarity, inimitability, durability, and substitutability. Moreover, the RBV is deficient in adopting a customer perspective inherent in the identification and development of value creation that can be re-adsorbed back into the firm.

The study has shown that boundary agents can be very effective surrogate sales professionals, and even more so, if they are brand evangelists. Thus, an interesting area of further study would be to determine how and why certain brands can achieve such status, and what are the factors that influence passionate customers to become brand evangelists.

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Websites

Teece, D (n.d) <https://www.davidteece.com/dynamic-capabilities> (last accessed 3 Jan 2022)

Appendices

Appendix A

Data Acquisition in the Classroom (BCU)

The purpose of this survey is to form the basis of a research thesis that seeks to investigate the behavioral intentions of teachers to consider the use of data-acquisition technology (a.k.a. probeware/data-collection technology/data logging) in their classes. The research will be conducted through Vernier Europe and Birmingham City University, and it will be used to determine how teachers can be best helped and supported using technology in the classroom. All data received will be anonymous to the researchers, and you have the right to withdraw your survey at any time. This survey should not take any more than 10 minutes to complete. If you would like further information regarding this survey, please feel free to contact me at venglish@vernier-europe.com, or Richard Frost at richard.frost@bcu.ac.uk. This survey closes on July 31, 2014. To thank you for your time, we will conduct a drawing for a \$200/€150 Amazon Gift Card. One winner will be chosen at random.

Many thanks for your time, Vincent English, CEO Vernier Europe & PhD Student

1. I would find data-acquisition technology useful in my job

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Using data acquisition technology would allow me to perform experiments faster and more efficiently

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Using data acquisition technology would increase my productivity

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. If I use data acquisition technology, I would increase my chances of promotion within the school

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. My interaction with the data acquisition technology would be clear and easy to understand

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. It would be easy for me to become skillful in using data acquisition technology

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. I would find data acquisition technology easy to use

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Learning to use data acquisition technology will be easy for me

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Using data acquisition technology is a good idea

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Data acquisition technology makes teaching more interesting

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Working with data acquisition technology is fun

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. People who influence my behavior think that I should use data acquisition technology in my class

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. People who are important to me think that I should use data acquisition technology

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. In general, my school has fully supported the use of data acquisition technology

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. I have the resources necessary to use data acquisition technology

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. I have the necessary knowledge to use data acquisition technology

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. I know where I can go to get help if I need it

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. I would still use data acquisition technology in a classroom even if there was no one around to tell me what to do as I go

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. I would use data acquisition technology if I had sufficient time to prepare for the class

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. I would use data acquisition technology if I had sufficient support materials with it

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. I feel apprehensive about using data acquisition technology

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. It scares me to think that I could lose my entire experiment by not knowing what functions to select

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. I fear using data acquisition technology without adequate training and support

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. Data acquisition technology is somewhat intimidating to me

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. I intend to purchase at least some data acquisition technology in the next 12 months

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. I would be more convinced to purchase data acquisition technology if recommended by another teacher

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. I would feel more comfortable buying data acquisition technology if I attended a workshop conducted by a current or retired teacher

Strongly disagree	Disagree	Have no opinion	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. What is your gender?

Female

Male

29. What is your age?

18 to 24

25 to 34

35 to 44

45 to 54

55 to 64

30. Are you a current user of data acquisition technology products?

Yes

No

acquisition

31. Do you have any comments you would like to add?

Data Acquisition in the Classroom (BCU)

You're almost done!

To thank you for answering this survey, we would like to enter you in a drawing for a \$200 or €200 Amazon Gift Certificate. If you would like to be included in the drawing, please enter your contact information and the address to which you would like the prize delivered if your name is selected. Your contact information will be used for the purpose of sending the prize to the winner, and will not be used for advertising or marketing purposes. If your name is chosen at the drawing, you will receive your prize in approximately two weeks.

If you don't want to enter the prize drawing, just leave the spaces below blank.

32. If you would not like to enter our prize drawing, just leave the spaces below blank

Name	<input type="text"/>
Title	<input type="text"/>
Email	<input type="text"/>
School	<input type="text"/>

Appendix B

The analysis will be guided by the TA (King, 2012) in an abductive approach that a grounded theory paradigm will not drive, but instead, themes will be primarily organised around key aspects of the supporting literature followed by emerging themes as the analysis unfolds (Fischer et al., 2010). The study is focused mainly on the competitive advantage of the firm through the mediating effect of boundary agents. Thus, the study is guided by the disaggregation of dynamic capabilities into its microfoundations that are underpinned by the specific sensing, seizing and reconfiguring capabilities of the firm. Accordingly, the supporting propositions and thematic analysis followed abductively from the case studies. Computer-aided software (NVivo v.10) was used for content analysis consistent with the procedure guided by the TA (Fischer et al., 2010; King, 2012; Strauss & Corbin, 1998).

Dendrogram of similar case company clusters

The following dendrogram relates to the similarity (as expressed by Jaccard's index) of the case companies shown in Table 6.35. The grouping of countries is chosen because the similarities in the dendrogram are directly proportional to the distances at each arm of the diagram. For completeness, the complete list of case companies is shown in Table E2 below and the areas of similarity cross-referenced.

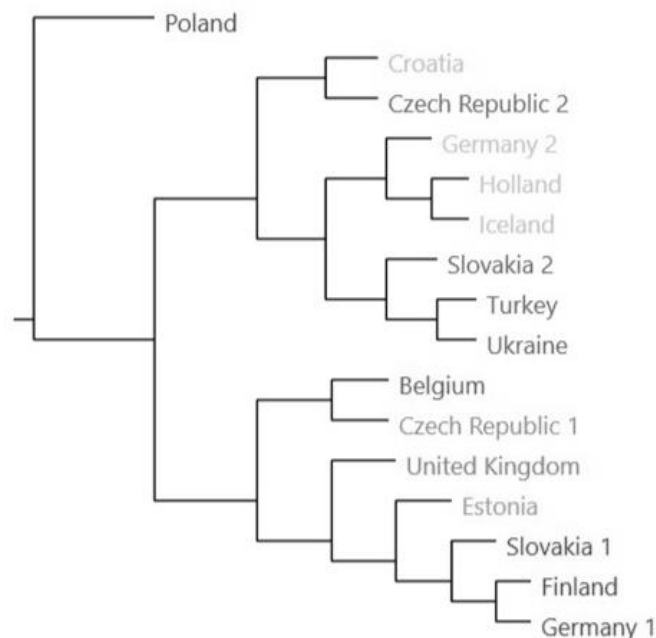


Figure E1 – Dendrogram of clusters by coding similarity

Table E1 – Pattern of activities across daughter nodes.

Tree\Daughter Node	PC9	PC12	PC2	PC13	PC10	PC5	PC3	PC6	PC11	PC7	PC8	PC1	PC4
Boundary agents & boundary spanning													
Behaviour of stakeholders	✓	✓			✓	✓		✓	✓	✓	✓	✓	
Boundary agents influences	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	
Codification of knowledge through boundary agents		✓	✓	✓	✓		✓		✓	✓	✓	✓	
Importance of using teachers to help promotion of products	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
Receptivity to information by firm		✓			✓	✓	✓		✓	✓	✓	✓	
Attendance at teacher conferences	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Training for teachers	✓		✓	✓	✓	✓				✓	✓	✓	✓
Using teachers in the firm	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
Workshops for teachers	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Knowledge capabilities													
Knowledge codification within company		✓			✓	✓	✓	✓		✓			✓
Knowledge integration		✓				✓	✓	✓		✓	✓	✓	✓
Knowledge sharing	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	
Methods of knowledge generation (external)			✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Methods of knowledge generation (internal)		✓		✓			✓	✓			✓		
Prior knowledge		✓	✓		✓		✓	✓		✓	✓	✓	
Tracking ideas	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
Localisation of products													
Importance of localisation	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Localisation of products	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓
Marketing capabilities and market positioning													
Regular customer contact	✓	✓			✓	✓	✓	✓		✓		✓	✓
Strong customer relationships	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓
Direct marketing activities	✓	✓			✓	✓	✓				✓	✓	✓
Market positioning	✓		✓	✓	✓		✓			✓			✓
Market segment	✓	✓		✓		✓	✓			✓	✓	✓	✓
Market share of distributor			✓		✓	✓	✓			✓	✓		✓

Tree\Daughter Node	PC9	PC12	PC2	PC13	PC10	PC5	PC3	PC6	PC11	PC7	PC8	PC1	PC4
Marketing strategy	✓				✓	✓	✓						✓
Trade shows and conference activities	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
Reconfiguring internal resources													
Ambidexterity in the firm		✓	✓	✓			✓	✓	✓	✓	✓	✓	
Speed of implementation		✓	✓			✓	✓	✓	✓	✓		✓	
Strategy for change management		✓		✓		✓	✓				✓	✓	✓
Unique “signature processes.”	✓		✓				✓	✓	✓	✓	✓	✓	
Seizing on external opportunities													
Entrepreneurial activity of managers & owners	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓
Leadership attributes of managers		✓					✓	✓			✓	✓	
Internal processes for adaption to opportunities	✓	✓		✓	✓		✓	✓		✓	✓	✓	✓
Sensing capabilities													
Boundary agent roles	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
Competitors activities	✓		✓	✓	✓	✓	✓			✓	✓		✓
Customer feedback	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
External inputs from teachers				✓	✓				✓	✓	✓	✓	
Generative sensing	✓	✓			✓	✓	✓	✓		✓	✓		
Sales professional activities	✓			✓			✓	✓			✓	✓	✓
Workshop activities for sensing	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Sustained competitive advantage factors													
Assistance from Genisys		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Feedback from distributor to Genisys	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Innovative products suitable for local market	✓		✓	✓	✓	✓		✓	✓		✓	✓	
Local office support	✓	✓	✓	✓	✓			✓			✓	✓	✓
Perceived Factors necessary for CA	✓	✓					✓	✓	✓		✓		
Quality and fit for the purpose of products	✓		✓	✓	✓			✓			✓	✓	✓
Skillset within firm	✓	✓	✓				✓	✓		✓		✓	✓
The firm's microfoundations													
Adding value for the customer	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
Antecedents	✓	✓		✓	✓	✓			✓	✓	✓	✓	
Asset orchestration		✓			✓	✓		✓	✓	✓	✓	✓	
Business model selection		✓				✓		✓				✓	✓

Tree\Daughter Node	PC9	PC12	PC2	PC13	PC10	PC5	PC3	PC6	PC11	PC7	PC8	PC1	PC4
Core competencies	✓		✓	✓	✓	✓		✓		✓	✓		
Division of responsibility within firm	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓
Educational background of workers	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Interrelationships between workers							✓	✓		✓	✓	✓	
Managerial agency	✓	✓		✓			✓			✓	✓		✓
Networking skills				✓	✓	✓				✓	✓	✓	✓
Path dependency	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Relationship with supplier	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Strategic Alliances							✓				✓		
Technology needs in the firm	✓	✓			✓	✓	✓				✓	✓	✓

Codes at nodes for case-study firms

The results will now continue with an overview of the most common codes nodes for each case-study firm. This will be presented in graphical form with a short commentary. In all cases in the discussion following, the terms “teachers” and “boundary agents” are interchangeable.

PC9 (Belgium) shows the nodes “skillset” (11%), and “factors of competitive advantage” (10.1%) are single the most prominent node loadings. Both of these nodes are closely related and reflect the previous experiences of the principal's shareholders, both former educators, with one of them being a former inspector of schools. However, the “importance of using teachers [boundary agents] in the firm” (7.1%) and “using teachers...” (6.2%) and “conducting workshops” (5.5%) also make significant contributions (Figure E2).

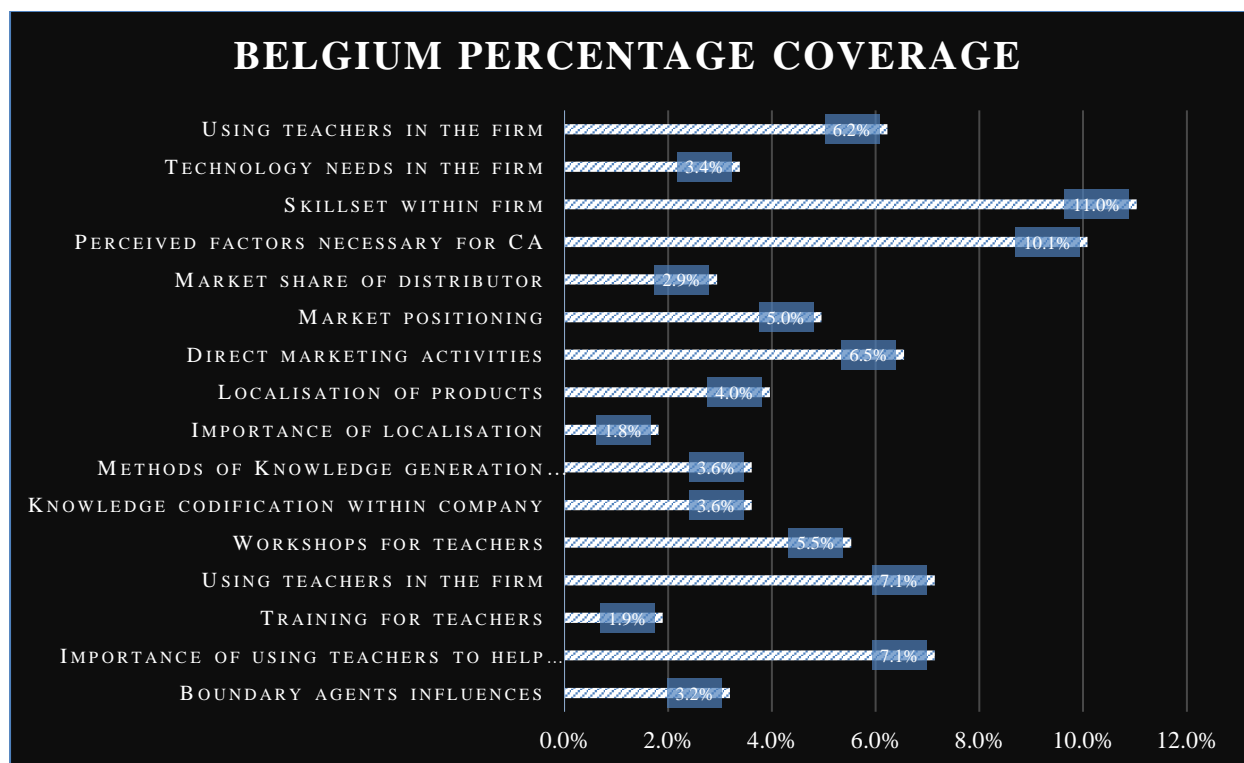


Figure E2 – Belgium coding by node.

The reliance on using boundary agents by PC12 (Croatia) is emphasised by the heavy loading of tree nodes, “importance of using teachers” (26%) and “boundary agent roles” (26.3%). Knowledge related nodes are also prominent (integration, 18.2%; codification from boundary agents, 16.7%; sharing, 14.8%; codification within-firm; 12.1%). Conducting workshops is also deemed important (15.3%). The findings demonstrate a critical dependence of boundary agents for information sharing and conducting workshops (Figure E3).

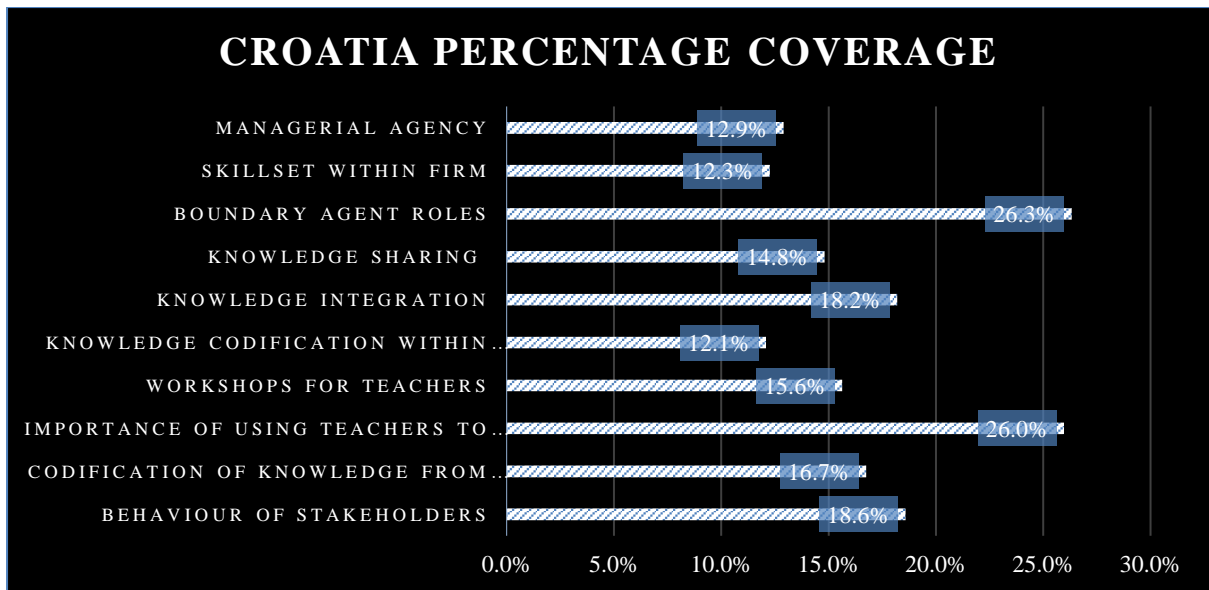


Figure E3 - Croatia coding by node.

In contrast, PC2 (Czech Rep) emphasise “important of teachers in the promotion of products” (10.6%) and the “skillset in the firm” (9.4%). These findings reflect the firm, mostly composed of two educators and an extensive network of part-time boundary agents as both colleagues in their university and strategically located school. Congruent with this is the recognition of the importance of “workshops” (8.7%), training for teachers [customers in this context] (7.2%). Generative sensing (5.49%) is the the next tier of prominence along with “competitor’s activities” (5.6%) (Figure E4).

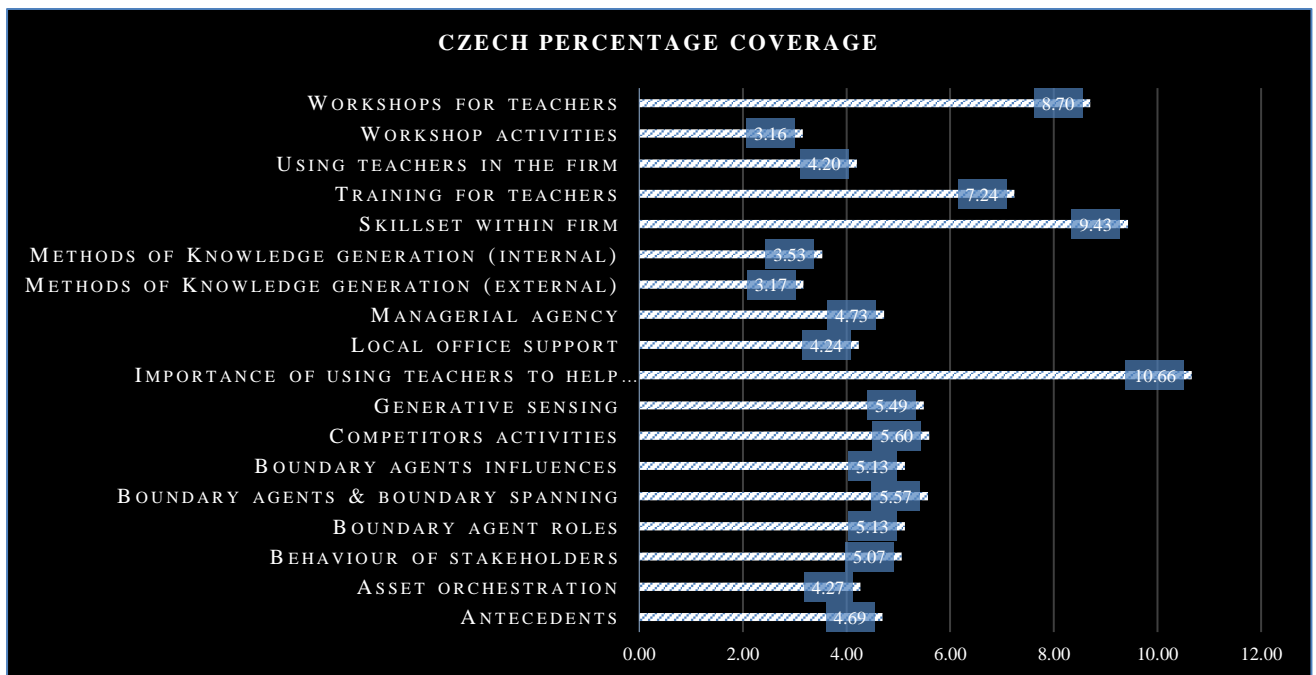


Figure E4 – Czech Republic coding by node.

PC13 (Estonia) underlines their reliance on boundary agents (“using teachers in the firm”, 16.9%). This is closely aligned with “...using teachers in the firm...” and the “importance of using teachers [boundary agents] are both 11.5% with discussions around the “...influence of boundary agents...” at 9.8%. Since the firm place a strong emphasis on the importance of boundary agents, the relatively high scores of workshops (9%) and training for teachers [customers after-sales service] (9%) is also correspondingly high. Accordingly, Estonia places great emphasis on “...training for teachers...” and “...local support...” (11.5%) using boundary agents (Figure E5).

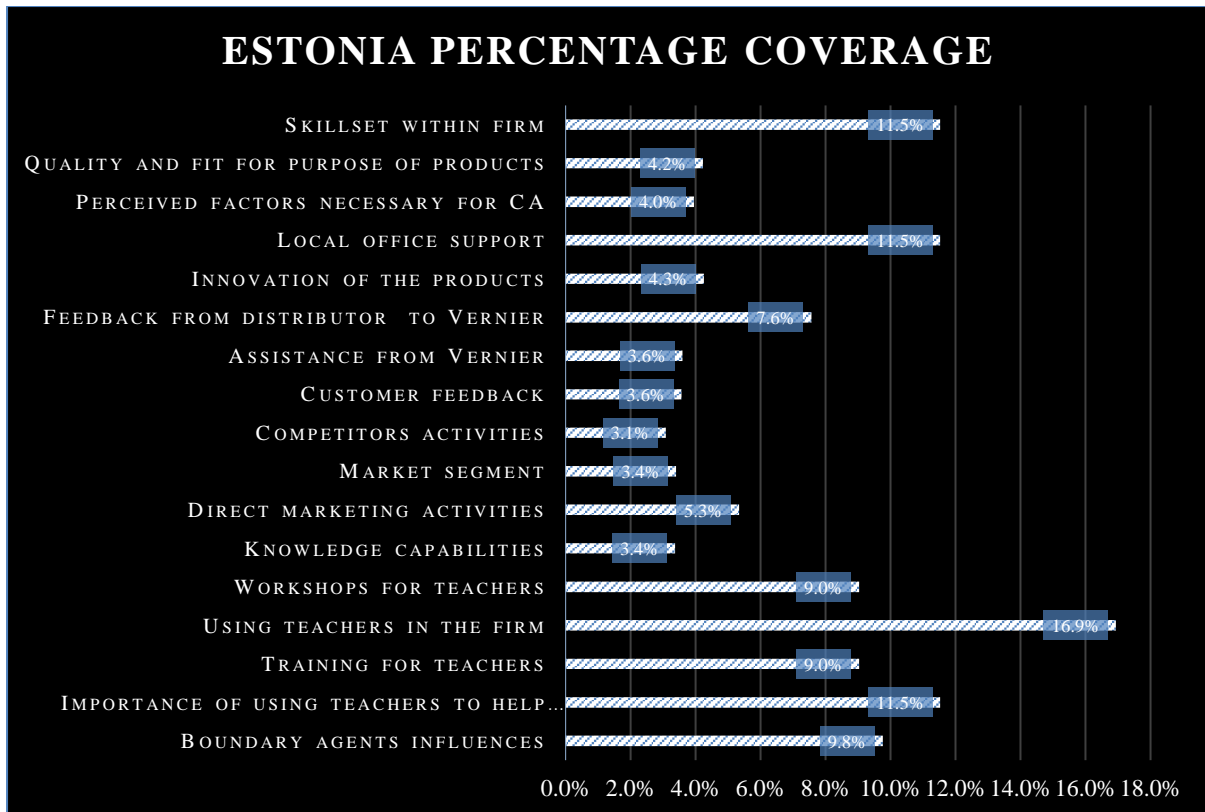


Figure E5 – Estonia coding by node.

The “...skillset within the firm...” is prominent (23.9%) in PC10 (Finland), which is due to the solid educational and professional teaching background of the senior management. Despite this, the prominence afforded to “...using teachers in the firm...” is also high (23%) along with “...local office support...” (20.1%). The “...importance of using teacher to help in the firm...” is also recognised (18.9%) and the firm is confident in its “...direct marketing activities...” (18.8%) and a correspondingly lower emphasis on “...workshops for teachers...” (11.9%). This would suggest that the skillset within the firm is viewed with relation to the input and contribution of the boundary agents. The skills within the enterprise are another term for the dynamic capabilities, and boundary agents are seen as part of that process (Figure E6).

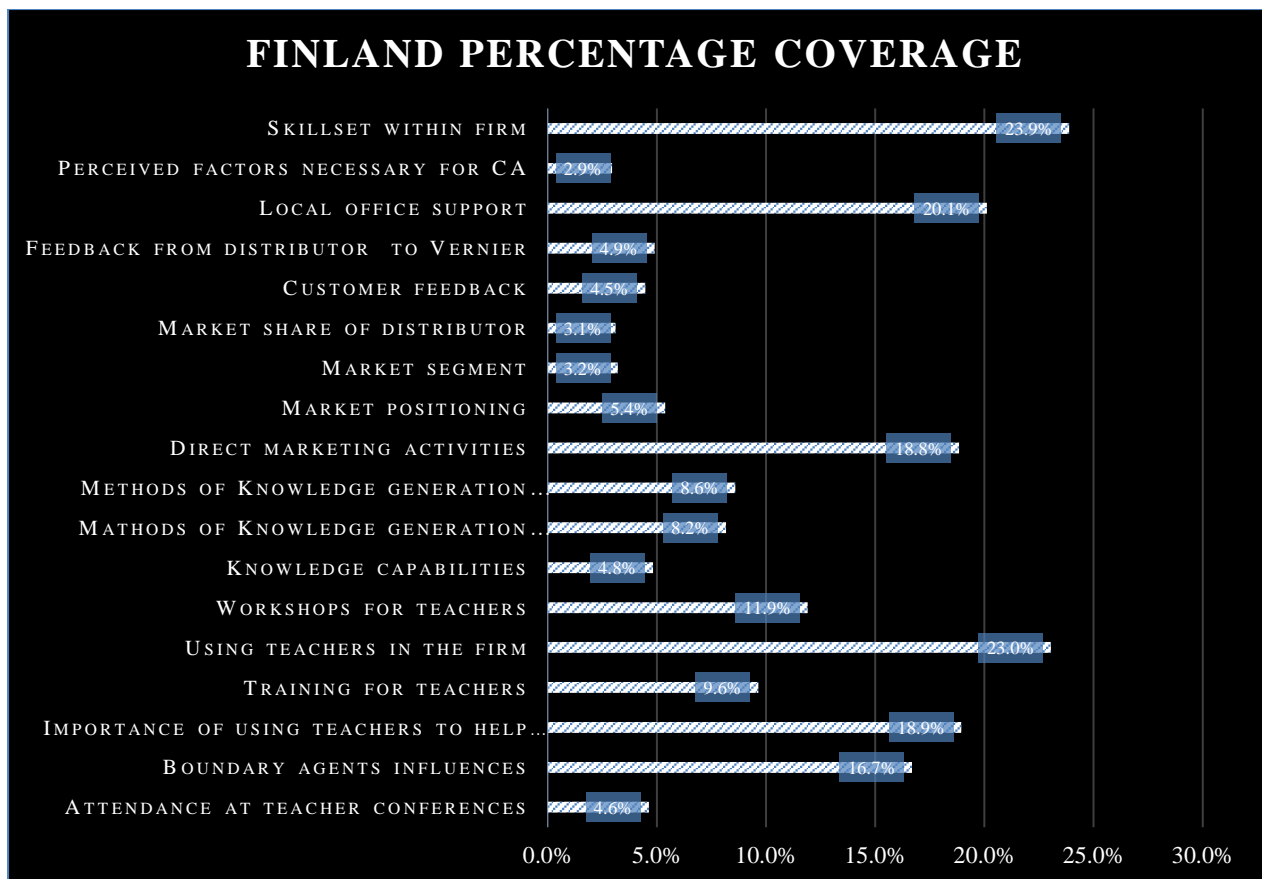


Figure E6 – Finland coding by node.

The distribution of tree nodes through both interviews with PC5 (Germany) is symptomatic of their unique business model employed in Germany. The majority of the sales are conducted through three main sub-distributors thus removing the firm from direct customer contact. Most prominent are “...direct marketing activities...” (9.33%) to support their sub-distributors and “...knowledge sharing...” (8.47%) within the firm and between the firm and its sub-distributors. Thus, “...managerial agency...” adopts a more critical role (7.69%) and the consequent “...knowledge codification...” (5.79%). However, the “... importance of using teachers [boundary agents] in the firm...” is also strong represented (6.29%). Finally, the German distributor refers to “...market positioning...” with a higher prominence than other distributors (2.58%), which suggests that they view workshops and boundary agents as very much part of the added value of the offering to the marketplace (Figure E7).

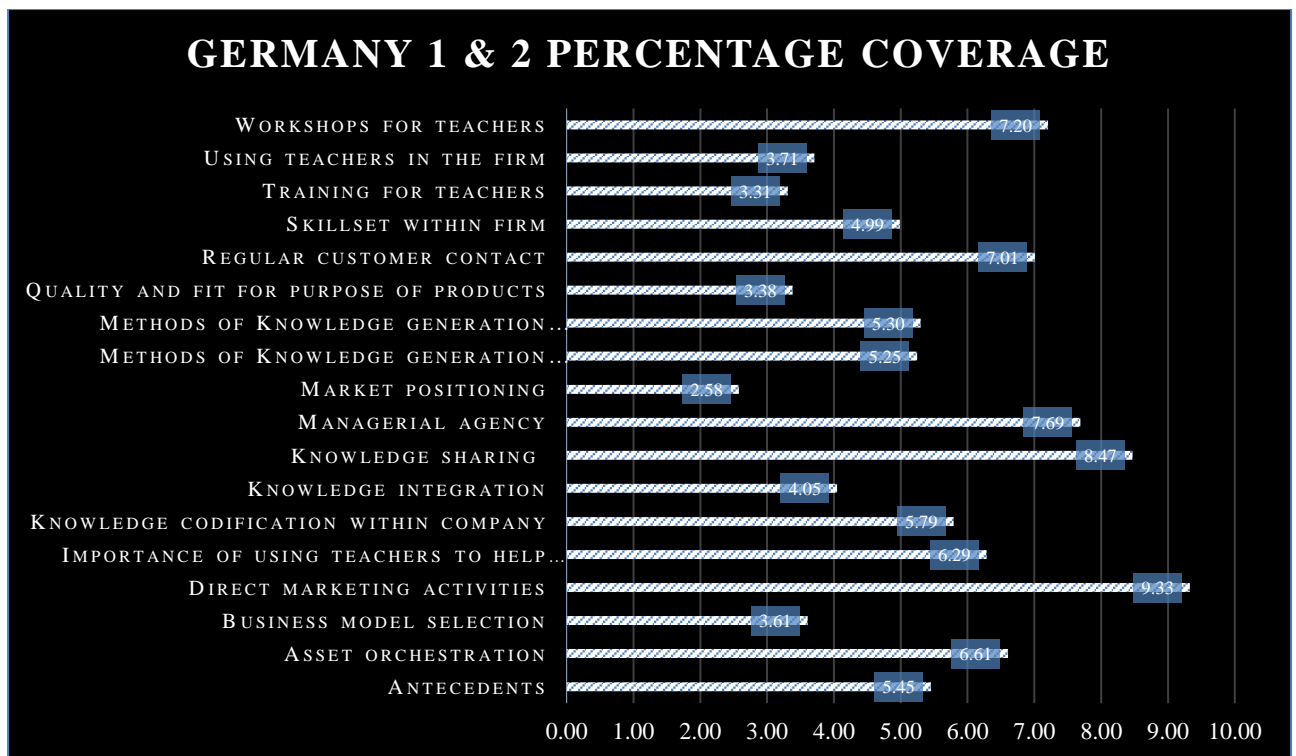


Figure E7 – Germany coding by node.

PC3 (Holland) is the largest of all distributors and is not considered an SME. Consequently, the coding of tree nodes focussed the strongest emphasis on “...asset orchestration...” (20.6%) and the firm’s “... ambidexterity...” (15.2%). Being a larger firm, “... antecedents...” exerts a higher influence (14.1%) and, similarly, “...knowledge integration...” (13.3%). Core competencies in the firm (10.9%) is closely aligned with “...managerial agency...” (9.7%) and “...leadership attributes of managers...” (9.2%). The agility of the firm is recognised through “... entrepreneurial activities of the managers and owners...” (10.6%), “...strategy for change management...” (10.2%) and “...speed of implementation...” of ideas (10.2%). Methods of external “...knowledge generation...” (15.2%) and “...knowledge integration...” (13.3%) is what would be expected in a large company. The role of the “...boundary agent...” is more formalised but is still significant (9.9%) (Figure E8).

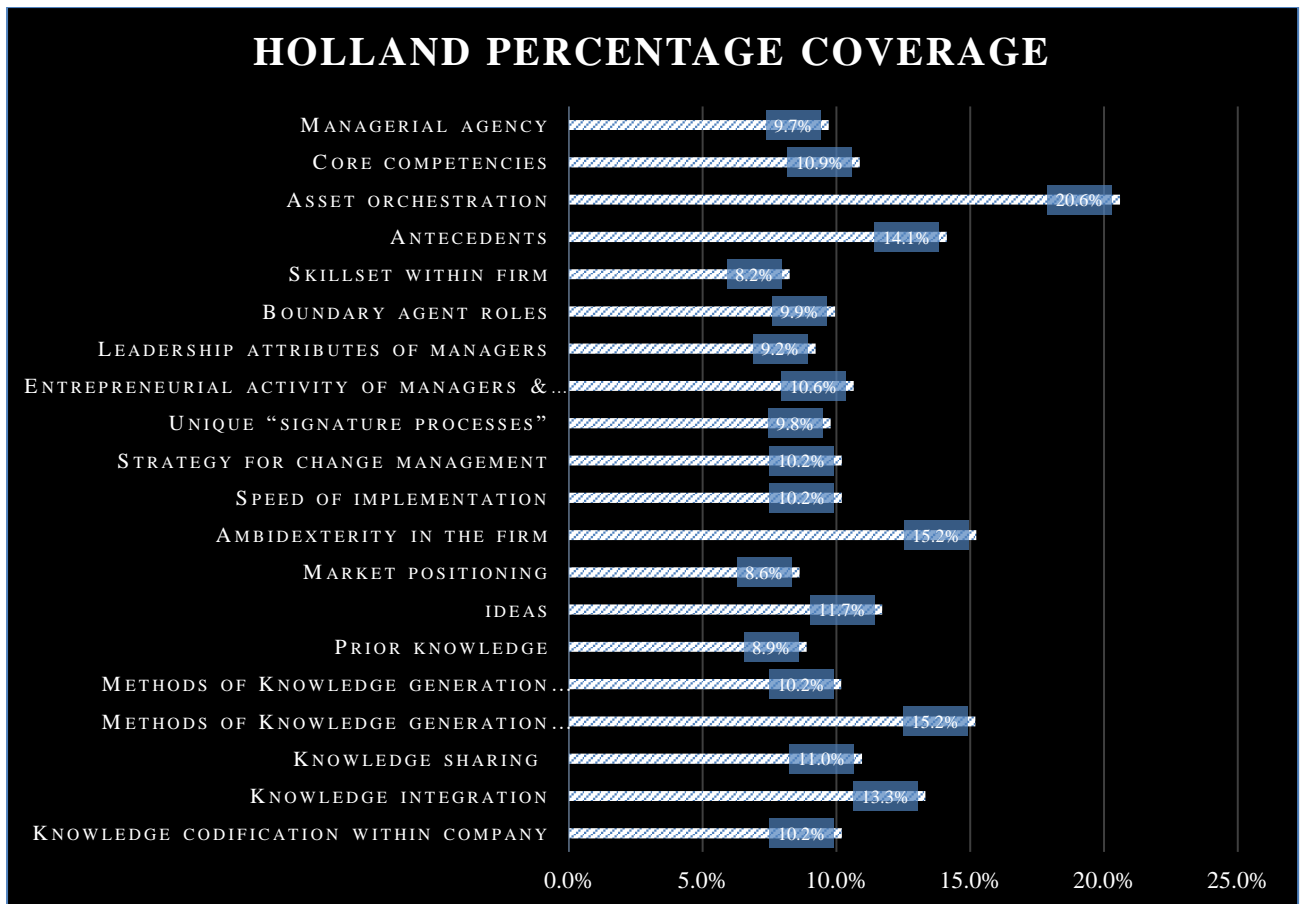


Figure E8 – Holland coding by node.

The findings for PC6 (Iceland) show an emphasis on “...knowledge integration...” (21.2%), followed by “...knowledge sharing...” (19.1%) and “...knowledge codification...” (17.6%). Maintaining a “...regular customer contact...” (14.9%) and building “...strong customer relationships...” (11.9%) is suggestive of the strong industrial bias in the firm. The desire of the firm to transfer as much of their skill base to a new educational venture is suggested by the CEO’s comments regarding “...ambidexterity in the firm...” (12.7%) and “...speed of implementation...” (11.3%). This is underlined by “...strategy for change management...” (9.6%) and “...unique signature processes...” (8%). The recognition that boundary agents can help this new business venture is referenced by “...the importance of using teachers [boundary agents] in the promotion of products...” at 9.4% of the coding at this tree node (Figure E9).

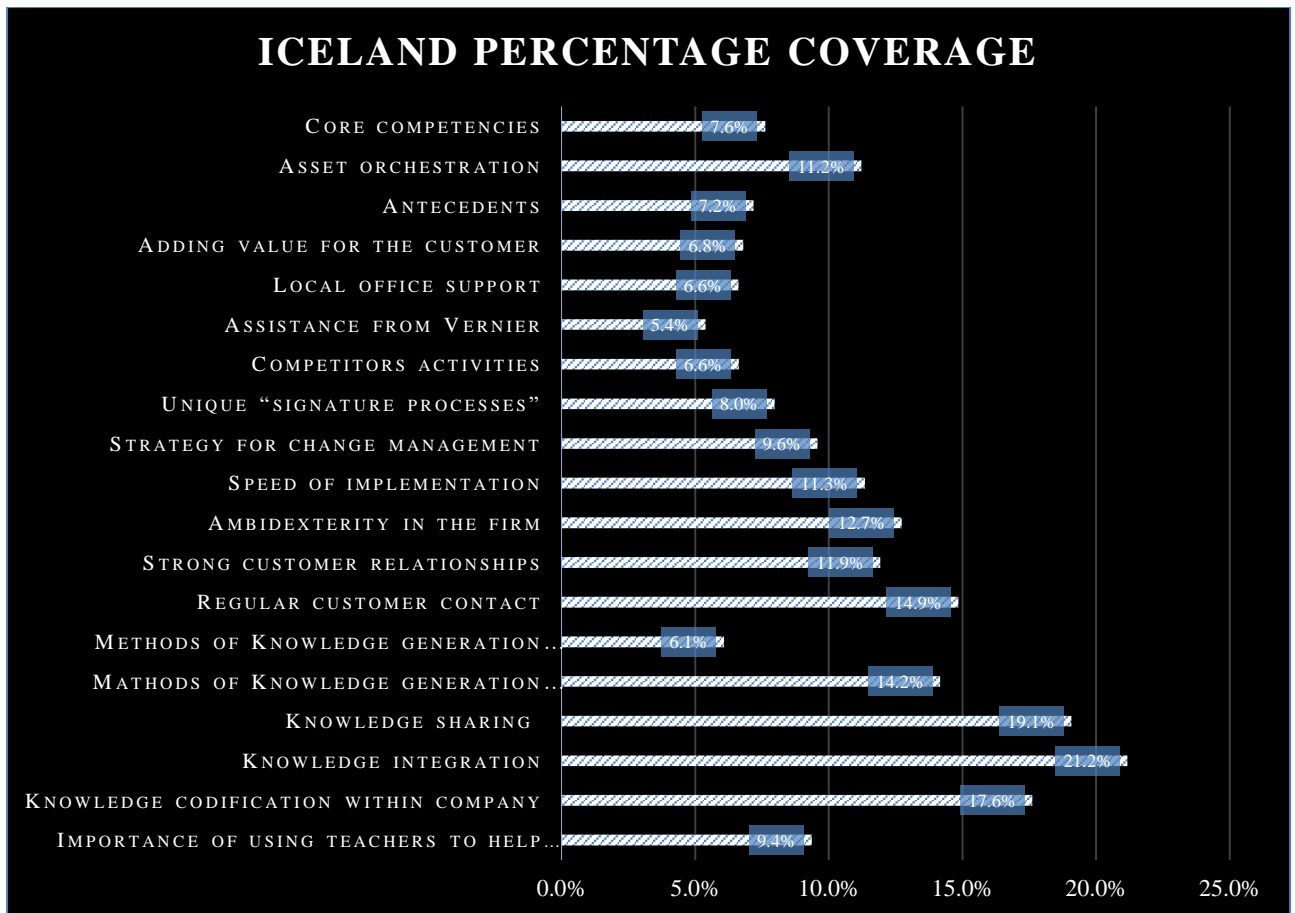


Figure E9 - Iceland coding by node.

The findings for PC7 (Slovakia) display the coding by node for both interviews 1 and 2 combined into a single data set. The emphasis on "...strong customer relationships..." (8.22%) is characteristic of the significance of large single public procurement competitions. The combination of "...core competencies..." in the firm (7.18%) and the "...importance of using teachers [boundary agents] to promote..." the products (7.7%) also underlines the necessity for the firm to build a high level of trust with the contracting authorities. PC7's emphasis on "...adding value for customers..." (6.3%) and the "...necessary skillset..." (6.82%) within the firm is further evidence of the challenging market conditions in Slovakia (Figure E10).

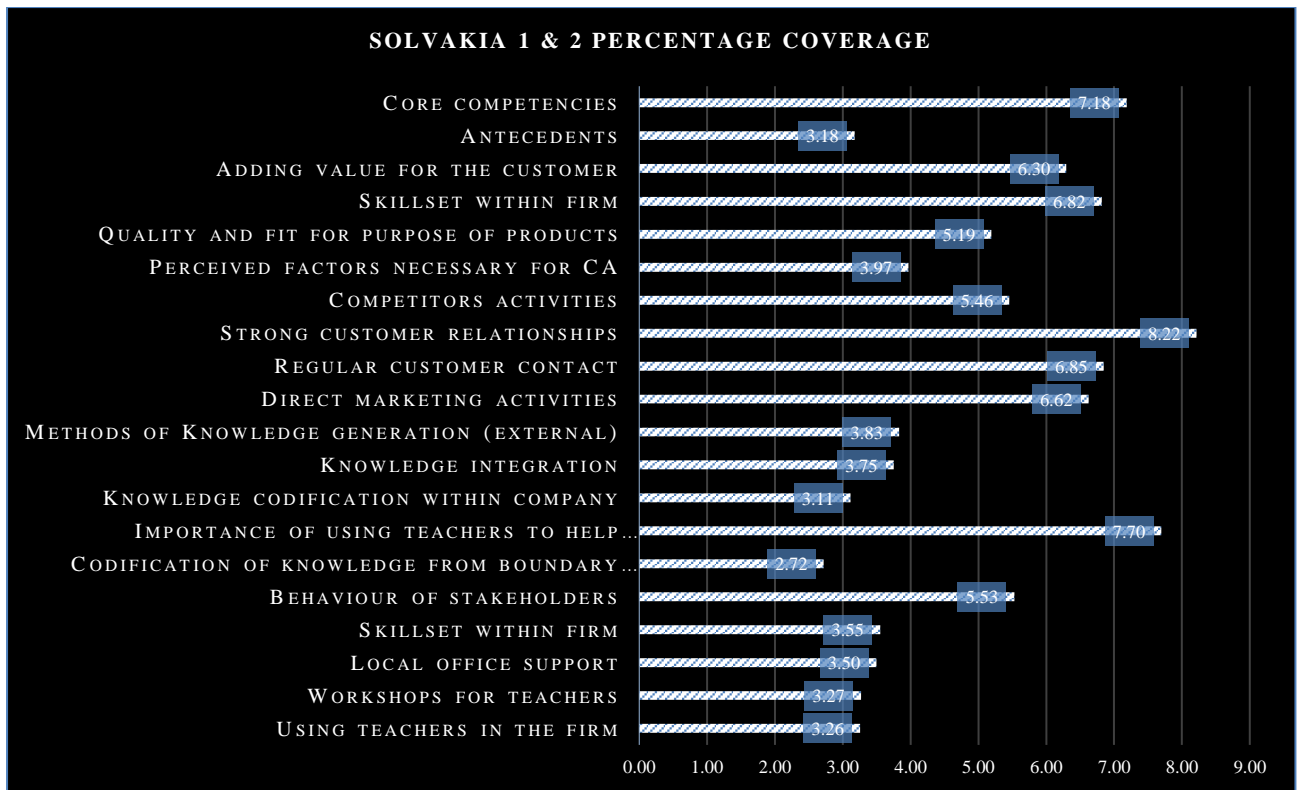


Figure E10 – Slovakia coding by node.

PC8 (Turkey) place a high value on using “...teachers [boundary agents] to help promote...” datalogging products (31.8%). The emphasis on “...knowledge integration...” (29.4%) is also significant, coupled with methods of knowledge generation “...internally...” (15.4%) and “...externally...” (19.8%). The firm’s importance attributed to knowledge is also reflected through “...knowledge-sharing...” (14.5%) and “...knowledge codification...” (15.5%). The influence on the culture of the firm is evidenced by the relatively high references to the firm’s “...antecedents...” (15.4%) and to a lesser extent through “...ambidexterity...” (8.3%). The role of the “...boundary agent...” in the firm (9.1%) and “...adding value...” for the customer (11%) are also of importance to PC8 (Figure E11).

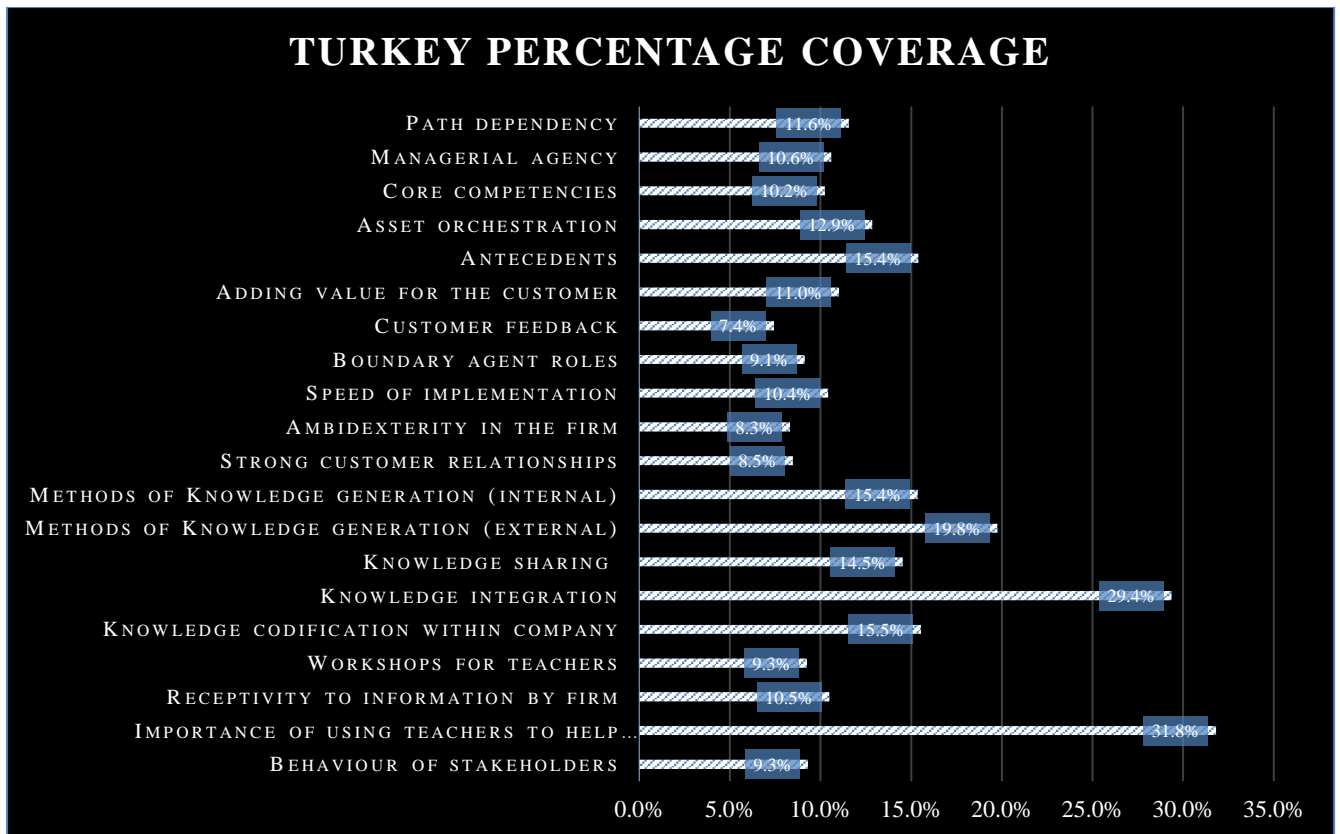


Figure E11 - Turkey coding by node.

PC4 place a high value on “...knowledge integration...” (14.9%), “...knowledge generation...” (14.9%), and “...knowledge codification...” (14.9%). The “...importance of using boundary agents...” is only marginally 6.4% coding at the node compared with 6.8% for “...workshop activities...” However, PC4 recognises the utility of boundary agents (13.8%) but does not afford them a prominent role in the “...promotion of the products...” (6.4%). Instead, the firm focuses on “...strong customer relationships...” (7.4%) and “...regular customer contact...” (7%). The firm is more aligned to a marketing strategy than an of the other case-study companies (9.1%), and its “...asset orchestration...” (7%) mobilised in this direction (Figure E12).

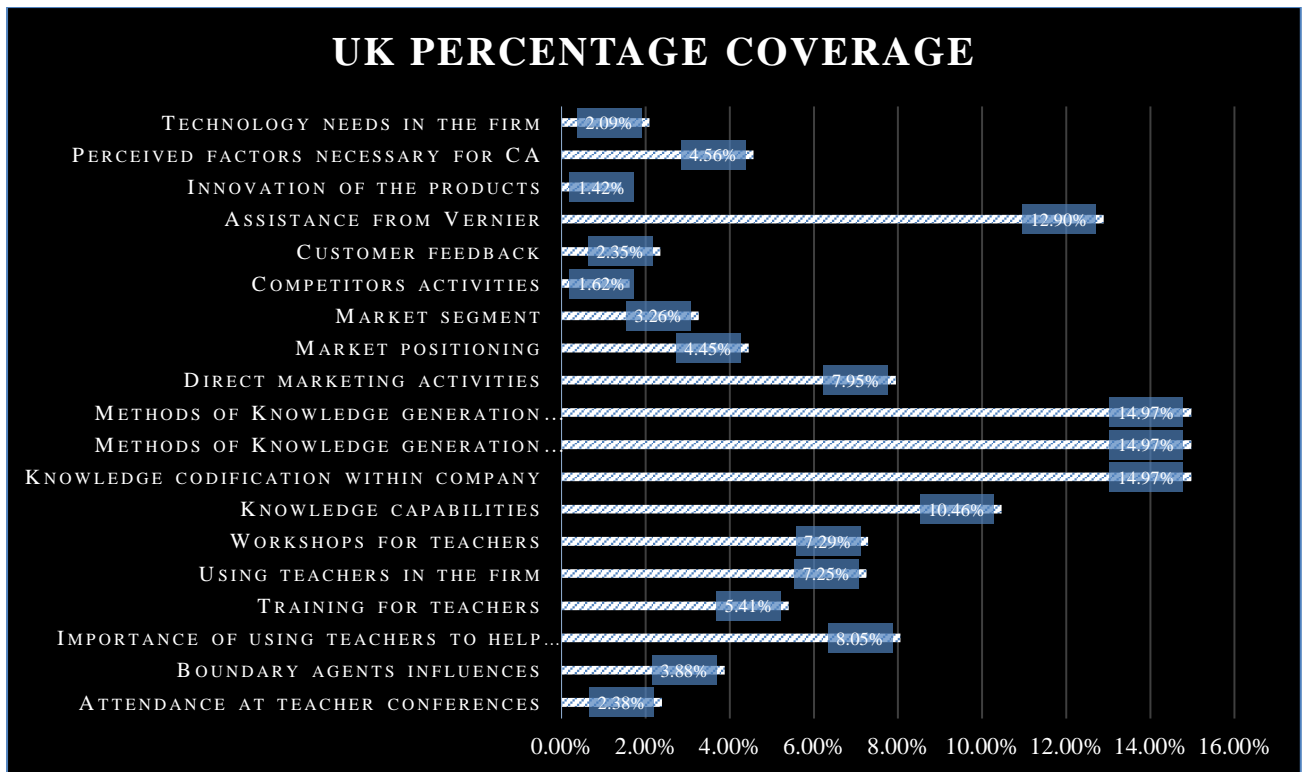


Figure E12 – UK coding by node.

PC1 (Ukraine) place a significant emphasis on both the “...importance of boundary agents...” (13.8%) and “...methods of knowledge generation...” externally (11.9%), suggesting a connection between these two nodes. Knowledge integration (7.7%) and sharing (5.8%) also feature prominently, along with “...strong customer relationship...” (7.4%) and “...regular customer contact...” (7%). PC1 operates in a new, rapidly growing market for datalogging, so their network of boundary agents is still evolving which is reflected in the relatively lower clusters of coding on the nodes “...workshop activities...” (6.8%) and “...workshops for teachers...” (6.8%). The “...marketing strategy...” coding is also reminiscent of the firm attempting to establish the brand positioning correctly in Ukraine (9.1%) and convey the message they want to convey (Figure E13).

UKRAINE PERCENTAGE COVERAGE

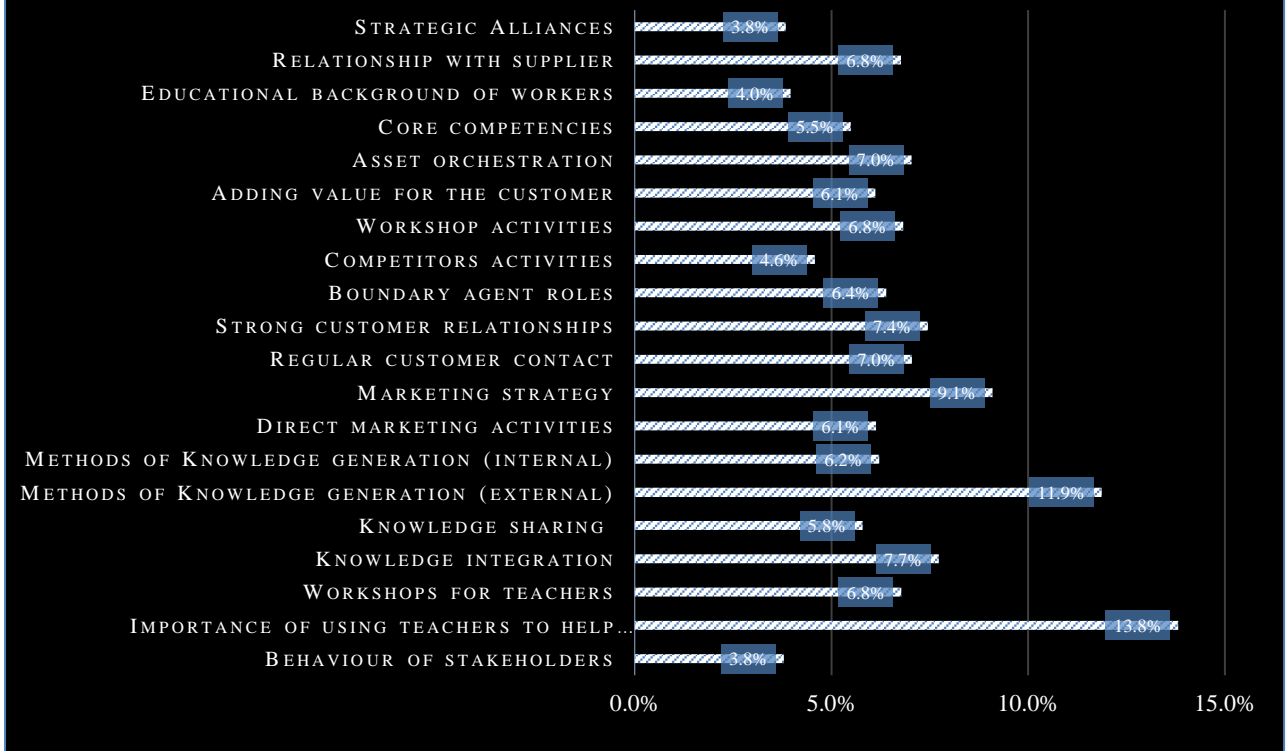


Figure E13 - Ukraine coding by node.

In summary, the main themes (Table E2) that have dominated the discussion with the distributors have been the importance of boundary agents and the effectiveness of conducting workshops as part of a sales and marketing strategy. Also, information gleaned from conducting workshops and other activities carried out by boundary agents are also important in assimilating essential knowledge for the firm and contributing to the microfoundations important to dynamism, which customers perceive as having value. The exception is the UK distributor, who still values the contribution of workshop activities, but relies more on traditional marketing activities and support from the exporting company.

Table E2 – Main themes from research.

Theme	Main Themes (Tree nodes)
1	The importance of using teachers as boundary agents (spanners) is a highly successful method of selling.
2	The firm has higher credibility in the market if they employ teachers (part-time or full time) as boundary agents (spanners) and are a major source of information.
3	Localisation of products in the host market is of critical importance, especially if the mother tongue is not English, although not as important in English speaking countries.
4	Boundary agents can have significant input into the localization of the product.
5	Boundary agents can have a positive effect on the relationships between an exporter and localised distributor through information exchange.

Frequency of keywords

Using NVivo, a search of the frequency of the most used words is shown in Table E3. Not surprisingly, the “teacher(s)” feature most prominent (2815 times, 17.0%). Only comments with a weighted percentage of greater than 1% are retained. Nouns, objects of verbs or prepositions are also discarded. Grouping of the words into commonly associated themes shows consistency with the overall importance placed on the boundary agents and their contribution to dynamic capabilities and competitive advantage (Table 6.42). Words such as “teachers” (17%), “schools” (8.6%), “customers & relationship” (8.35%), “workshops” (4.5%) and “sales” (4.1%) are related in a context of selling of data loggers. Other groupings of words such as “workshops” (4.6%), “technical & support & training” (5.4%), “curriculum” (1.5%) and “value” (1.2%) relate to added value for the customer. In terms of dynamic capability building and factor of competitive advantage, “new & product & innovation” is deemed necessary (11.6%) along with “quality” (1.2%). The microfoundations of the firm’s dynamism is underlined by the importance of “information & knowledge” (7.7%).

Table E4 - Word groupings and significance.

Groups	Words	Comments
Focus on teachers and workshops	Teachers, teacher, information, customers, necessary, workshops, workshop, marketing	The clustering narrative around educators and workshops attests to the significance of the seminars as a basis to meet potential customers in a relaxed environment.
External sensing and rapport building through after-sales	Question, market, knowledge, science, school, training, support, curriculum,	Conducting workshops with boundary agents is an effective method of external sensing and market intelligence gathering.
Characteristics of Genisys in market positioning	Market, Genisys, company, product, innovative, technology, Secondary (schools), quality, competitors,	The success of the previous groups above obviously must be underpinned by products that are of sufficient quality, fit for purpose and localised (usually in non-English speaking host markets)

Hierarchal tree node groupings.

When performing an exploratory cluster analysis, NVivo search for similarity of terms used under all tree nodes is shown in the following dendrogram (Figure E15). The calculation is based on Sørensen's similarity coefficient (S_s), which tests the degree of similarity (or otherwise) based on the Euclidean distance between each term. The dendrogram shows the overarching hierarchal “competitive advantage”(CA), which is the ultimate goal of dynamic capability development and the ultimate focus of this study. Seventy-four of the word grouping displays a Sørensen's coefficient $>.6$. The strongest grouping influencing CA is “Leadership attributes of managers” and “Entrepreneurial activity of managers & owners” ($S_s = .88$). The group of nodes in Table E5 (where $S_s > .80$) reveals the underlying microfoundations that undergird the dynamic capabilities of CA in the case-study companies. Important dynamic capabilities are the “Speed of implementation” of seized opportunities in moderate by “Ambidexterity in the firm” ($S_s = .85$). Seizing of opportunities are only possible if there is effective “Knowledge sharing” and “Knowledge integration” ($S_s = .85$). An important factor in CA is that the products are localised and relevant to the local market ($S_s = .84$). The firm must also have an effective “Strategy for change management” and be able to effect a speedy implementation ($S_s = .84$) and “Ambidexterity in the firm” ($S_s = .81$). The accumulation of knowledge is also closely related to “Customer relationships” and “Customer contact” ($S_s = .81$).

Table E5 – Hierarchal node grouping ($S_s > .80$)

Node A	Node B	Sørensen's coefficient (S_s)
Seizing of external opportunities\Leadership attributes of managers	Seizing of external opportunities\Entrepreneurial activity of managers & owners	0.88
Reconfiguring internal resources\Speed of implementation	Reconfiguring internal resources\Ambidexterity in the firm	0.85
Knowledge Capabilities\Knowledge sharing	Knowledge Capabilities\Knowledge integration	0.85
Localisation of products\Localisation of products	Localisation of products\Importance of localisation	0.84
Reconfiguring internal resources\Strategy for change management	Reconfiguring internal resources\Speed of implementation	0.84
Knowledge Capabilities\Methods of Knowledge generation (internal)	Knowledge Capabilities\Methods of Knowledge generation (external)	0.83
Marketing and Market Positioning\Customer relationships	Marketing and Market Positioning\Customer contact	0.81
Reconfiguring internal resources\Strategy for change management	Reconfiguring internal resources\Ambidexterity in the firm	0.81

The second grouping of tree nodes (Table E6 $S_s > .70 < .80$) recognises the contribution of boundary agents through “Workshops for teachers” and “Training for teachers” ($S_s = .79$). “Using teachers in the firm” and “Boundary agents influences” exhibit a strong similarity in coding across all nodes ($S_s = .74$). Using “Workshops for teachers” as an effective means of promoting datalogging is shown by the substantial similarity with “Importance of using teachers [boundary agents] to help the promotion of products” ($S_s = .72$). Allied to the use of boundary agents is “Knowledge codification within a company” and “Methods of Knowledge generation (external)” ($S_s = .78$). Unique “signature processes” in the firm are closely associated with “Speed of implementation” ($S_s = .76$) if the seizing of opportunities leads to CA. This will depend on “Asset orchestration” and “Antecedents” ($S_s = .75$). In general, knowledge codification and gathering through the agency of boundary agents is one aspect, but the agility of the firm and its current repertoires of capabilities and resources are also a necessary condition for CA through the development of dynamic capabilities congruent with the firm’s environment.

Table E6 - Hierarchal node grouping ($S_s > .70 < .80$)

Node A	Node B	Sørensen's coefficient (S _s)
Localisation of products\Localisation of products	Localisation of products	0.79
Boundary agents\Workshops for teachers	Boundary agents\Training for teachers	0.79
Knowledge Capabilities\Methods of Knowledge generation (external)	Knowledge Capabilities\Knowledge codification within company	0.78
Knowledge Capabilities\Knowledge sharing	Knowledge Capabilities\Knowledge codification within company	0.76
Reconfiguring internal resources\Unique “signature processes.”	Reconfiguring internal resources\Speed of implementation	0.76
The Firm's microfoundations\Asset orchestration	The Firm's microfoundations\Antecedents	0.75
Knowledge Capabilities\Methods of Knowledge generation (internal)	Knowledge Capabilities\Knowledge codification within company	0.75
Boundary agents\Using teachers in the firm	Boundary agents\Boundary agents influences	0.74
Knowledge Capabilities\Methods of Knowledge generation (external)	Knowledge Capabilities\Knowledge integration	0.74
Reconfiguring internal resources\Unique “signature processes.”	Reconfiguring internal resources\Ambidexterity in the firm	0.74
Knowledge Capabilities\Methods of Knowledge generation (external)	Knowledge Capabilities\Knowledge sharing	0.74
Sustained competitive advantage\Skillset within firm	Sustained competitive advantage\Local office support	0.73
Boundary agents\Workshops for teachers	Boundary agents\Importance of using teachers to help promotion of products	0.72
Knowledge Capabilities\Methods of Knowledge generation (internal)	Knowledge Capabilities\Knowledge sharing	0.72
Reconfiguring internal resources\Unique “signature processes”	Reconfiguring internal resources\Strategy for change management	0.72

Reconfiguring internal resources\Speed of implementation	Seizing of external opportunities\Entrepreneurial activity of managers & owners	0.71
Seizing of external opportunities\Relationship with customers	Seizing of external opportunities\Entrepreneurial activity of managers & owners	0.70
Reconfiguring internal resources\Speed of implementation	Seizing of external opportunities\Leadership attributes of managers	0.70
Seizing of external opportunities\Entrepreneurial activity of managers & owners	Reconfiguring internal resources\Ambidexterity in the firm	0.70

Finally, the grouping of hierarchal tree nodes in the range $0.6 > S_s < 0.69$ is presented in Table E7. As boundary agents are not (in most cases), the prominence at the “third tier” is to be expected. The most notable similarity is between “Importance of using teachers to help the promotion of products” and “Behaviour of stakeholders” ($S_s = 0.69$), where the advocacy of boundary agents is an important factor in cases of large public procurement projects. The association of boundary agents and “local office support” ($S_s = 0.66$), “Generative sensing” ($S_s = 0.63$), “Training for teachers” ($S_s = 0.61$), “Knowledge integration” ($S_s = 0.61$) and “customer feedback” ($S_s = 0.60$) is evident in a variety of roles for the firm.

Table E7 - Hierarchal node grouping ($S_s > 0.60 < 0.69$)

Node A	Node B	Sørensen's coefficient (S_s)
Boundary agents\Importance of using teachers to help the promotion of products	Boundary agents\Behaviour of stakeholders	0.69
Sensing capabilities\Boundary agent roles	Boundary agents\Behaviour of stakeholders	0.68
The Firm's microfoundations\Path dependency	The Firm's microfoundations\Antecedents	0.67
Knowledge Capabilities\Methods of Knowledge generation (internal)	Knowledge Capabilities\Knowledge integration	0.67
Sensing capabilities\Workshop activities	Sensing capabilities\Boundary agent roles	0.67
Marketing and Market Positioning\Market segment	Marketing and Market Positioning\Market positioning	0.66

Node A	Node B	Sørensen's coefficient (S_s)
Boundary agents\Using teachers in the firm	Sustained competitive advantage\Local office support	0.66
Boundary agents\Importance of using teachers to help promotion of products	Sensing capabilities\Boundary agent roles	0.66
Sustained competitive advantage\Local office support	Boundary agents\Boundary agents influences	0.64
Sensing capabilities\Workshop activities	Sensing capabilities\Generative sensing	0.63
Boundary agents\Codification of knowledge from boundary agents	Boundary agents\Behaviour of stakeholders	0.63
Sustained competitive advantage\Skillset within firm	Boundary agents\Importance of using teachers to help promotion of products	0.63
Boundary agents\Using teachers in the firm	Boundary agents\Training for teachers	0.62
Boundary agents\Training for teachers	Sustained competitive advantage\Local office support	0.61
Sensing capabilities\Generative sensing	Sensing capabilities\Customer feedback	0.61
Boundary agents\Workshops for teachers	Sustained competitive advantage\Local office support	0.61
Boundary agents\Workshops for teachers	Sensing capabilities\Boundary agent roles	0.61
Knowledge Capabilities\Knowledge integration	Boundary agents\Importance of using teachers to help promotion of products	0.61
Boundary agents\Workshops for teachers	Boundary agents\Using teachers in the firm	0.60
Boundary agents\Receptivity to information	Boundary agents\Codification of knowledge from boundary agents	0.60
Reconfiguring internal resources	Seizing of external opportunities\Leadership attributes of managers	0.60
Boundary agents\Training for teachers	Boundary agents\Importance of using teachers to help promotion of products	0.60
Boundary agents\Workshops for teachers	Boundary agents\Behaviour of stakeholders	0.60
Sensing capabilities\Customer feedback	Sensing capabilities\Boundary agent roles	0.60

Node A	Node B	Sørensen's coefficient (S _s)
Marketing and Market Positioning\Direct marketing activities	Marketing and Market Positioning\Customer contact	0.60

The dendrogram in Figure E15 gives a graphic representation of Tables E3 to E7 and shows the hierarchical structure of the nodes and the Euclidian distance between each node.



Figure E15 – Hierarchical words groupings (NVivo 10 output).

Word groupings between tree nodes

The Pearson correlations between the word groupings are shown in Table E8. The full correlations analysis (652 pairings) is too large to show on this report (Pearson's *r*). Only correlation of .9 or greater is provided in Table 6.47.

Table E8 - Pearson (*r*) correlations of word groupings.

Tree Node\Daughter Node A	Tree Node\Daughter Node B	Pearson correlation coefficient
Knowledge sharing	Knowledge integration	0.96
Workshops for teachers	Training for teachers	0.96
Methods of Knowledge generation (internal)	Methods of Knowledge generation (external)	0.95
Knowledge integration	Knowledge codification	0.95
Methods of Knowledge generation (external)	Knowledge integration	0.95
Knowledge sharing	Knowledge codification	0.94
Methods of Knowledge generation (external)	Knowledge codification	0.94
Methods of Knowledge generation (external)	Knowledge sharing	0.94
Customer relationships	Customer Contact	0.93
Workshops for teachers	Importance of using teachers to help promotion of products	0.93
Methods of Knowledge generation (internal)	Knowledge codification	0.93
Leadership attributes of managers	Entrepreneurial activity of managers & owners	0.93
Skill set within firm	Local office support	0.93
Speed of implementation	Ambidexterity in the firm	0.92
Importance of using teachers to help promotion of products	Behaviour of stakeholders	0.92
Methods of Knowledge generation (internal)	Knowledge sharing	0.92
Using teachers in the firm	Boundary agents influences	0.92
Methods of Knowledge generation (internal)	Knowledge integration	0.92
Importance of using teachers to help promotion of products	Boundary agent roles	0.91
Strategy for change management	Speed of implementation	0.91
Asset orchestration	Antecedents	0.90
Boundary agent roles	Behaviour of stakeholders	0.90

The findings show that knowledge related activities dominate the higher positive correlation values. “Knowledge sharing” and “knowledge integration” correlate very strongly ($r = .96$). Likewise, methods of internal correlate strongly with external knowledge integration ($r = .96$). The importance of “knowledge codification” is reflected in its strong correlations with “knowledge integration” ($r = .95$), Methods of Knowledge generation (external & internal) ($r = .95$ & $.94$), and “Knowledge sharing” ($r = .94$). There is also a high correlation between “workshops for teachers” and “training for teachers” ($r = .96$), suggesting a strong connection between the added value to customers perceived by the firm pre- and post-sale. Additionally, “Importance of using teachers to help the promotion of products” and

“workshops for teachers” also correlate strongly ($r = .93$), indicating the importance of boundary agents in the pre-sale delivery of workshops for customers. An interesting, strong correlation ($r = .92$) is shown between “Importance of using teachers to help the promotion of products” and “Behaviour of stakeholders”. This relationship refers to the utility of boundary agents in overcoming challenges in public procurement and inhibitions from potential customers in using datalogging in their classrooms. A similar relationship is seen between “boundary agent roles” and “behaviour of stakeholders” ($r = .90$). The microfoundations of dynamic capabilities in the firm are revealed through resources and capabilities such as “skill set within-firm” and “local office support” [for customers] ($r = .93$). Additionally, the managerial agency is revealed through the strong correlation ($r = .93$) between “leadership attributes of managers” and “entrepreneurial activity of managers & owners”. The flexibility and agility of the firm and thus its ability to seize opportunities is expressed through another strong correlation ($r = .91$) “strategy for change management” and “speed of implementation”, which is further underpinned by “ambidexterity in the firm” ($r = .92$). The importance of direct and frequent customer contact is also evident ($r = .93$) between maintaining “customer relationships” and “direct customer contact”. Finally, the ability of the firm to respond quickly is moderated by the relationship between “asset orchestration” by the firm and “antecedents” within the firm hinting at path dependency factors consistent with conclusions drawn in dynamic capability scholarship (Tallott & Hilliard, 2016).

Coding similarities between case-companies

The Jaccard index (also known as the Jaccard similarity coefficient) examines the similarity and diversity of sample sets (Table 6.48). It is the sum of the union of a pair-wise set of data and the quotient of their intersection (Jaccard, 1912; Real & Vargas, 1996). Jaccard’s similarity coefficient shows a strong word commonality between Ukraine & Turkey (.75); similarly, strong Jaccard’s coefficients are present for Turkey/Slovakia (.71), Ukraine/Holland (.71) and Turkey/Holland (.69). The degree of similarity is reflected in their responses to how they value boundary agents as contributors to firm-specific dynamic capabilities. The remaining pairings range from .62 to .39.

Table E9 - Jaccard word similarity coefficient

Source A	Source B	Pearson correlation coefficient
Ukraine	Turkey	0.75
Turkey	Slovakia	0.71
Ukraine	Holland	0.71
Turkey	Holland	0.69
Ukraine	Slovakia	0.69
Slovakia	Holland	0.62
Turkey	Slovakia	0.44
Slovakia	Holland	0.41
Ukraine	Slovakia	0.39

Appendix C



Birmingham City Business School

Perry Barr
Birmingham
B42 2SU
United Kingdom

05 February 2015

Dear [Dealer Name]

Please see the attached questions I would like to cover with you.

I expect that they should not take any longer than 40-45 mins. As you know, they are part of a structured PhD study at BCU supervised by Professor Mark Gilman, Mr Richard Frost and Dr Juanling Huang. Al, the usual ethical conditions apply, namely that you do not have to be part of it, and you can withdraw at any time (even after the interview). The main questions are in italics. The "probes" are just to give you some triggers if you find the questions too general or unsure of what we want. The questions are divided into sections, with each section and subsection in bold. This is just to give you an idea of the reason and angle of the question or set of questions. We do not need much detail, so don't worry. We would rather it was spontaneous, and we do not expect you to do any major preparation at all.

For my part, I want to build up a framework to help all our dealers be as successful as possible and will share the conclusions in a summary form with dealers. No dealer's names will be mentioned in any of the research, and I will not be looking for any company sensitive information. Please be assured of that. Also, please be assured that you are in no way under the spotlight, or that we are seeking sensitive marketing information. You have nothing to fear from this, as we are more than happy with your efforts in your respective countries.

I am really looking forward to talking to you, and I apologise that it has taken so long to do it!

Kindest regards

A handwritten signature in black ink that reads "Vincent English".

Vincent English,
CEO Genisys Europe

Semi-structured interviews examples

Belgium

How did you find and locate customers and opportunities?

I think the most opportunities are found at trade conferences for science teachers. There are some bigger conferences each year organised in the Flemish and French parts of Belgium – we see a lot of differences in both sides of the country. In the Flemish part we are not the only one that is there also there are other companies that sell sensors. In the French part we only see Pasco and other companies I cannot name. This is the most specific place where we meet teachers where we also participate in training sessions with teachers where we can demonstrate materials and give teachers opportunities to have hands on experience with the materials. Specific marketing tools are emails, newsletters, web sites – these go out every couple of months. This is most of the specific points on how we locate our customers.

What market segments (that is primary, secondary, high school, university) do you specifically target and why do you do so? If you do not specifically target some markets, what is your general approach to selling Genisys?

I think from where our company started, we only started serving the secondary schools we kind of had an evolution on the high schools and universities but the most effort and marketing is going towards secondary schools mostly because we think there is most possibilities and most of the schools are looking at starting data logging. For primary education we do not see that many schools asking for the materials. We went to try some primary educators, but budgets are so low that there is almost no interest. Also, the knowledge is not there in primary education so mostly secondary schools. We see a lot higher schools and universities getting to work with us also. Most primary schools do not have the budgets for datalogging. There is not a market there. The reason we would go after secondary schools is because the products are suitable, they have a very good alignment with other products like the calculators and the tablets that are wildly used in these secondary schools by every student almost. They are really using technology every day in secondary schools.

How is knowledge shared or generated in the firm?

Our company is very much like an all-in-one printer, we are a small group we can have formal discussions and small meetings to point out new developments in the market but we are now also planning to have more personnel in the company so we have to really work at sharing knowledge in the company. So far it has been me and my father that has been really the knowledge database about Genisys and we just do small trends about new products and new developments with teachers that sometimes go and do training for us.

What is the division of roles and responsibilities in the Company?

For the moment we only have three roles which would be product experts and the sales responsibility and then there is one person for logistical and technical support and that's basically it.

How is market knowledge integrated into the company?

It has benefitted us that we have an education background especially Jean really knows well how the education system works, of course, also our country is a difficult one where we have four governments for education so it is very specific in our country, so I think we know the market very

well. Jean, my father has been a maths teacher for 20 years and then he went as a school inspector for 15 years, so yes, he practically knows all the secondary schools in Belgium.

What is your background, Philip?

I did my university studies in the physical science and sport. In university I have a good level of physics, chemistry, biochemistry, physiology so that has been very helpful for going into schools and talking about the products that we sell. I understand what I am saying. Of course, there are limits to what products and subject specific areas I can talk about but yes physical science has been very good introduction for me. In my previous job I was a sports instructor and a guide for team building which was good for guiding groups, schools, teachers so I have no problem talking to groups and giving demonstrations and anything like that.

Do you find that the fact that Jean was a teacher once and the fact you have such a solid scientific background do you think that helps you when you go in front of teachers? Do you think they have better respect for you?

Yes definitely. I think because sometimes when teachers ask questions specific about analysis it is important for them to have someone who has a real answer the question and not ignore the question and talk about other things.

Do you think that teachers are happy and freer with information to you from the fact that you have a scientific background and also Jean? Do you think it helps?

It's important for them to feel comfortable in asking questions, how they can use this in classroom, its important also I think just on the mind-set that they are talking with someone who understands the market and not just one salesperson who wants to sell.

How do you assess your own internal market knowledge?

Yes, that is a good question. I cannot think of a specific way that we do that. I think for our company that is a big challenge to us. Yes, we have our server running here in our office where we have specifically product support and other stuff on Genisys products and all the stuff what is happening around. We keep it in a place, but we don't really structure it much.

How are your competitors doing?

There are lots of schools where I go to and I find old material, specifically CMA¹ has been there for some years, most of the teachers I speak with replace their CMA Coach labs or their PASCO² systems they are very excited about the Genisys products, about the ease of use but at first really taxing with each other with our competitors to one project or one school it really doesn't happen. When we visit a school and they work with the materials and they tell us they are also testing other systems in the market we say that's fine let us know what you think about it – we don't see big discussions about it, we don't see price or anything about our competitors.

What do you think their marketing strategy might be, do they emphasise they are cheaper, or they are more innovative, better quality or do you not notice any of that?

That's a really good question because I think I can't really answer, definitely not that they are cheaper, I think that prices are generally all the same.

¹ Competitor

² Most important competitor

Do you have an internal measure yourselves that can tell you how big your market share is or how well customers are satisfied with you? Do you have any kind of way to track those yourselves?

Our market share is very difficult to say. It would be very good to know our market share, but it's very difficult to say because that's really something we don't know. It would be interesting to see precisely what technology schools are using, what is available, how it is used but that is something we don't know. For the schools who are our customers with us we keep track very much of how they use it and how excited they are, and these results are very good always.

What are your own technological needs in the company?

I think we have invested in the last few years in our technological needs. We have our own training room, we have meeting rooms, and we have a lab with all the materials to give workshops for up to 20 people. It requires some audio visual materials specifically for the centres and experiment equipment so what do we need more, I think extra support from Genisys it should be important samples and demonstration units, showroom equipment, because I don't think there are agreements on that. We use always the latest products for demonstrations.

How do you combine your internal and externally gained knowledge?

Most of the time we organise a company meeting and have an informal talk with each other.

Do you look to use innovative ways to combine external knowledge of the market, customers or competitors with the internal knowledge you already possess?

We don't really have a structured mechanism for that, but we now start to really have on a regular basis we organise training sessions which are free to come in for any teacher in our training rooms. We also send out every month a newsletter to schools to science teachers with specific ideas for an experiment and also an invitation to have a workshop for a demonstration of the sensors in their school. These were quite good.

Do you have skills or knowledge in curriculum design and/or innovation? Can you give some brief examples?

We often work with teachers that work part time for us doing demonstrations and workshops and they are part of the curriculum committee, specifically for the chemistry part in secondary schools.

Do you translate software into local language?

We work with Europhysica³ – our Dutch colleagues in the Netherlands. Sometimes there are small differences in words that are different in the Netherlands than in the Flemish, so we have to look for a word that is specific accepted by the teachers in the Netherlands and in Flanders. Sometimes teachers in Flanders are not so open to Dutch words. But everything is translated by Europhysica. Sometimes it is difficult for one word because in the Netherlands they use a word, and we don't use it at all.

Do you translate some or all of our experiment manuals?

Not all the manuals but we have 30 – 40 experiments that we have fully translated because they fit the curriculum really well. They are easy to give the teachers when they buy the sensors.

Do you need to modify them to suit the local curriculum?

Yes, slightly.

³ Dutch distributor of Vernier

Do you think localisation is important? How important (scale 1-10)?

8/9 – Very important, our customers I don't think are scared but they are practiced when the solution is not in their language. The manuals are not that important but the experiments like the readymade experiments and especially the software on the Lab quest and the LoggerPro should be localised.

Does your firm have the pedagogical skills to advice on curriculum design and implementation?

Yes, we have these skills in place.

Therefore, do you then agree with me that employing ex teachers or current teachers is a very important strategic decision for the company?

Yes

Does this extend to all areas of science and STEM?

Yes, we are still working to cover more on the engineering part and the technology. I think all the engineering is really specific in Belgium but basically, we cover all the areas of STEM education

What are the most important factors needed for you to enjoy a competitive advantage in your market?

Just having to work with high quality products that you are sure teachers and customers would like to use. Also pride and margin is very important on that. How you can keep margin and not have to fight with competitors, I think these are the most important factors.

Is there an importance to having the leading innovative products in the market?

Yes of course. I think it's very important to show that you have innovative products that it's important that there should be a long-term durability of the products. They have to be future proof.

Are we (Genisys) the most innovative?

Yes definitely, compared with any competitor at the moment I think Genisys stands way beyond.

Is there anything you can do locally to assist further in innovation?

Not really, not that I can think of. Keeping a dialogue open between all is important.

Do our products suit the local market?

Yes, I think definitely the secondary schools and the high schools, as I said before the primary education there is not really any interest in the budgets available but I think all the equipment we have to offer to local markets is needed.

If we brought out a new product, how would you promote it?

We would definitely nowadays communication via email, by website also social media is becoming more and more relevant but we are also I think for the new products that are out there like the motion decoder system I immediately took it to all the schools I went to without them even asking for the product but just showing new products and letting people see that you work with highly innovative products is very good.

Do you think we could help you if we could co-ordinate better in terms of marketing and letting you know what is coming sooner or help produce files that you can use quicker?

Not really, for the moment I think all the communication and marketing we get from Genisys is the best we get compared to other suppliers. It's a very open and good relationship where to my feeling is it couldn't be better co-ordinated.

Do you think you could provide adequate teacher support in a cost-effective way?

Yes, the most demonstrations we do are free. We don't ask any money for it, just to get the most teachers involved with the products.

What do you think is the value of doing workshops for teachers? Do you think they are valuable to the company?

Yes, definitely. It shows I think that you cover the whole spectrum of services that you offer to a school. It shows not just good marketing but demonstrating of products. You can sell the products; you can do after service. It shows that you see the importance of having the whole solution for a school.

Would you say that workshops are a very effective method of selling?

Yes, for us it is because in our country it's the teachers that decide, it's not the school. The school decide whether there is a budget or not but it's the teachers who decides what materials they like or what materials they don't like so really organising workshops before a school knows the technology is very good, also very effective afterwards when a school requests quotes and we say there is a free workshop after you have ordered our equipment, we will organise a workshop the teachers really appreciate it.

Where have you positioned the Genisys range in the market (for example, the quality, premium end, or low-cost end)?

I think everyone will agree that it's the best education material for the normal reasonable prices. I think some schools they position us too expensive but still I think we have very on quality and all-round solution we have a very good position in the market.

Quality at a medium cost. Would that be it?

Yes

How do you track ideas in the company?

Sometimes we really brainstorm for ideas, also being innovative in ways we can change our communication, change some activities but the most of our ideas come in the form of talks with each other.

If you need together external knowledge, how do you do that?

That's difficult to say. I don't really know about that. We are always attending conferences; we are always screening the market for what's going on. It's also the contact we have with other dealers in Europe helps. **Presumably you have links with say influential teachers and curriculum managers and so on.** Yes, I think also Jean has really very good contacts with political advisors in Belgium. Those people visit schools every day like mostly before there is an inspection these people will go and see where they can do better. We have good contacts with these people.

Are you happy with the information exchange between yourselves and Genisys? Is there anything we can do to improve?

No not really, I think it's very good how it's going.

Would you be interested in joining a product development group that sits halfway inside of Genisys and half out of it?

I have a feeling that most people who are in there are experts, and they are pretty much in the same thoughts that we have about where we should be going. At least that on the latest developments we seem to think that. Jean suggested that because we have spoken about STEM education that maybe there is still a gap in the Maths because of course Jean is a maths teacher for so many years. He said there is so much room to improve on the maths segment as well.

Slovakia

How do you find and locate customers and opportunities?

The main possibility is to enter any possible conference and meeting of teachers, this is first. Slovakia is small country, and if we have an important school that uses and really likes Genisys another school will see it and want to use and buy it also. If another school has competitive equipment, they will see Genisys as a product that is easy to operate and so on and they will purchase Genisys compared to other products. Personal meeting with peoples is important.

What market segments (that is, primary, secondary, high school, university) do you specifically target and why do you do so? If you do not specifically target some markets, what is your general approach to selling Genisys?

The main activity is secondary schools and also universities. Universities are important but mostly the teacher training colleges. There are over 80 of them. We will target biology this year, it is important to target the new teachers who graduate as they will have experience of Genisys when they leave university to teach in the secondary schools. Even for primary schools, we feel we have more possibilities but not very easy to meet all the primary schools because they are so many of them. Secondary schools are a bit easier as they hear from other schools and go directly to buy Genisys.

Usually, I offer 2 or 3 hours of workshops to show the product then they think about buying it. We will present at conference next week to show both secondary and primary schools.

How is knowledge shared or generated in the firm?

We are a small company, me and my wife. She is a physics teacher who has a lot of ideas about science, and she helps me a lot. She is starting her PhD in teaching of ICT in science. We just talk when we can about business.

How is market knowledge integrated into the company?

Do we need this information, or not, that is what we decide? English is not widely spoken, and we can translate and mail it out. Universities, I just send it in English.

Do you employ anyone who has been an educator in a science classroom, or is still involved directly in education?

I have two employees, me and my wife (part time). She is a full-time teacher and helps when she can. In the past I have employed several teachers on a stand-by contract when it was necessary to do some training. Rules for part-time employing in Slovakia has changed and the paperwork is crazy, so that nobody wants to employ anyone part-time anymore, me too. I have reduced my activities to be more focussed because of the difficulties in employing people in Slovakia.

Question: If you do, can you give a very brief outline of their background in education in terms of number.... How many years' experience and their specialist subject areas?

Solid state physics, my PhD is there. I worked in solid state chemistry for many years, so my background is chemistry and physics. My wife teacher's mathematics, ICT and generally all the computer sciences, also physics and network technology (as CISCO systems etc).

Define the contribution of the science educators in the company (e.g., do they provide feedback from the market? Are they part of marketing and strategic planning meetings?)

The main source of money for buying is EU projects and they are so crazy, they have a lot of training within a few months, so everyone is extremely busy. Then some part of the year they are employed. Last month some activity from ministry wants to focus on STEM. Slovakia is a country heavily dependent on car industry, so they need more people educated in technology. Universities averaged 90 physics students each year, now only 2 or three (presumably PhDs)

How do you access your own internal market knowledge?

We share out information on the cloud so we can share all the documentation.

Three main competitors in Slovakia. The main is CMA system; they are at main university in Bratislava. They were here before me and have some advantage and more access to teachers. We have better support, and they will see that Genisys is better equipment. Our other competitor (Pasco) does not appear yet. Lobbying at ministry can help. The price is not a problem to sell. The people in schools are not looking at the price if they have the money. If they do not have the money, any price is a problem. Private schools buy equipment from their own budget whilst the state schools need to wait for funds. In either case, the main topic is not money.

How do you measure how you are doing in terms of customer satisfaction?

I visit schools and talk to teachers. The main way I can measure my effectiveness is if the equipment is being used. Off course it can also be on the shelves not being used. Mainly I do not see a problem with us or Genisys. 5 or 6 teachers out of 50 really want to use the equipment. The rest do want to use it because they are lazy for some other reason. If those good teachers leave the school for better salary or whatever, that school is dead.

What are your own technological needs in the company?

I would say that is the advantage of Genisys over the competitors. I would say it is the interconnectivity of the products. We have cables and Wi-Fi sensors now. Same sensors can be used with iPad, they are easy to use a family of easy-to-use products. For the future we need to see what technology are being planned and introduced. Samsung tablets with old Android sent to the schools. We have to translate almost everything to Slovak language. In the company, we do not anything special.

How do you combine your internal and externally gained knowledge?

Do you look to use innovative ways to combine external knowledge of the market, customers or competitors with the internal knowledge you already possess?

Do you have skills or knowledge in curriculum design and/or innovation? Can you give some brief examples?

This is something that my wife will do. She is the best person in the company. To have a woman to do this is better for marketing.

Do you translate software into local language?

Yes. LabQuest, but not LoggerPro yet.

Do you translate some or all of our experiment manuals?

Yes. Plus, the technical leaflets.

Question: Do you modify them to suit the local curriculum?

Not much modification needed. Not too much.

Do you think localisation is important? How important (scale of 1-10?)

Some rules in Slovakia, there has to be certain documents supplied with product that is translated into Slovak. So, I would say 10 - the most important. Software maybe not so critical! So, for software introduced to primary schools, it needs to be in Slovak. So, overall, for software, I would rate at

Does your firm have the pedagogical skills to advice on curriculum design and implementation?

Question: Does this extent to all areas of science and STEM?

What are the most important factors needed for you to enjoy a competitive advantage in your market?

Most innovative, nice products people use easily and training also necessary.

Is there an importance to having the leading innovative products in the market?

Yes

Are we (Genisys) the most innovative?

Yes.

Is there anything you can do locally go assist further in innovation?

Not sure what we can. The conference in March might give me some ideas. No idea what to do.

Do our products suit the local market?

Yes, for sure.

Question: How do you market your products?

Can you market more efficiently if we both co-ordinated better?

No idea. The process is fine at the moment. I do not see any problems.

What is your opinion on the value of doing workshops for teachers?

Yes important! I am always looking for people at conference who are more tuned in than most. I will target their schools to visit do a workshop. You can send tens of thousands of e-mails, mailings, but you show the teachers what the product can do. Sometimes 15 mins is enough.

Question: Are workshops an effective method of selling?

Yes, definitely.

Where have you positioned the Genisys range in the market (for example, the quality premium end, or low-cost end?)

Quality, innovative like BMW! Some customers have switched away from competitors. The competitor equipment is hard to use and none functioning. We have never had that with Genisys.

Question: What methods do you use to increase brand awareness and market penetration?

I am preparing my papers for the conference, and I need to give a message. My message is to use the iPADS to assist in selling. Just come and touch the Genisys and they can see how they can affect teaching. We do direct mailing in terms of leaflets etc.

Are there are modifications to products, marketing, information exchange, product development you would like to be directly engaged with?

Everything is fine; just to help me with high level meetings.

Poland

External Scanning

Researcher: How do you find the market at the moment?

CEO: Since the election there has been a change in regulations in how schools will work. I will give you an example, the primary schools, before it was finish on 6 years old and now it will take up to 8 years old. The kids will go to gymnasium⁴, or how do you say...the technical version of the gymnasium. So, schools now have to find themselves in the new situation. So, when we try to discuss these changes and requirements they [teachers] still say they are unsure of what or exactly how the new regulation will impact on them. So, they are not really willing to say what they need. For example, in laboratories for a typical day [in school] they do not know how the new regulations will work. The disadvantage now is that he has for [the situation] is that this started last year and continues into this year, so there is a stagnation because of this change. This is one of the biggest factors we are dealing with, and the other is that there is not a good factor ratio with the dollar [US Dollar]. If the currency was better, you would see what I am talking about. For importers it is not good information, for exporters it is fantastic information – unfortunately not for importers! The prices I charge here are really low, I try not to push them high. We keep them as attractive as possible. It is not easy but this year we have two nice opportunities. The first we have is similar to Copernicus and they open in another big city in Poland. We have a very good chance because of the contacts we already have there. I have been there a few times and it seems that Pasco, who is our main competitor, is not recognised as a better offer.

Researcher: Why is that do you think? Why is your offer better?

CEO: That is interesting. They [the customers] are not so much focussed on price they are mostly focussed on preference for our systems. They are influenced by the recommendation of users in two other similar sites in Poland to use our equipment. The second reason is the innovation of the products that we propose year by year. The new wireless sensors we promote and the free software for every platform, for example, Android. This is great for here as Android in Poland is much more popular than iOS. I suppose in US, iOS is much more popular and Android much less. Here it is completely opposite, iOS is less used. These devices are much more expensive. You can have an Android device for a fraction of the price; but they are not as good, but good enough to do the work. I try to show them we have the five years warranty and these main reasons.

Researcher: What about your relationship with them [teachers] – it seems to be good?

CEO: yes, it is good. In the creation of this new centre the guys who are building this centre were also working with our equipment in the first Copernicus centre. So, they know the equipment and me also.

Researcher: What was your background, Rafal? Did you come from an educational background?

⁴ Gymnasiums are secondary schools in many European countries

CEO: I am an educated as an engineer with the additional education in the faculty of education. In Poland you have to spend an additional two years in study that allows you to teach. Yes, I have a teaching qualification. I was a teacher for over 2 years in High School.

Researcher: Do you think that by being a former teacher, they [schools] like to buy from you?

CEO: Yes, for me to “break the first ice” as we call it here to have a common ground makes it easier if you can say something about the environment in which you share. I don’t think it is significant later because you show them the equipment in Polish language and use with Android and then they see for themselves. But [being an ex-teacher] is important for the first contact.

Researcher: How many works with you?

CEO: Yes, we are two working at home. But I use my friend of my company whop has storage space they are taking care of receiving equipment if I am not here for example. You can see that the shipping address can be different to the office address. Because it makes easier for me to handle.

Researcher: Is a full-time job?

CEO: No, I work in my own company 100%. My wife is a pharmacist – for her a part time job.

Researcher: How do you find and locate customers and opportunities?

CEO: The market is flat at the moment and this year they will change... the regulation for schools is changing. To be honest, it is my weakest point and a weak point of the company. Each year your point to areas we should be targeting, and you are not happy with the levels of business if you compare it to other countries. It should be compared to people living in Poland. If I was good at that it should be higher. I tried asking the other dealers to get some idea how they were doing to. I have a website and advertise it through Google. When a customers comes to me with about an offer, I ask him “how did you find out about this offer?” How they found Verner – it was extremely complicated advertisements. We try to place advertisement in newspapers [magazines] for schools that are distributed across the country to schools. They reach every school in Poland. The response is close to nothing. What is working is the people who are visiting the National Education Centre and the teachers are asking about the products. If they are Googling the products online, they will also find the contact person at the Centre who is a specialist. So, if they are interested in setting up a physics laboratory, they will Google the physics specialist at the centre and ask for advice. They are the people who are finding us. I have not good experience with ads. I tried to reach directly the schools directly by internet. Something came out of this, and I have a good database out of it. The Newsletter comes from you, and I forward to them. We are reminding them we exist. Also, the 400 teachers that know us are making good recommendations about us to the other teachers they know. Tis the second main group of possibilities [referrals] as to how he [a teacher] comes to us and learns about us. Other teachers recommend.

CEO: Is this typical?

Researcher: Yes, it is very typical between dealers. They are effective and work well. Conferences are effective and always there.

CEO: What is the German model?

Researcher: The German market set up to have 4 major-sub dealers operating from the maim dealer. You just visit them and motivate them and to tray and cover all of Poland.

Researcher: What other product line do you carry?

CEO: Only Genisys. Nothing has changed, we are not dealers of something more.

Researcher: What is your specific market target – secondary schools, universities?

CEO: My primary focus is on the meat of the schools. The gymnasiums and technical secondary schools.

Researcher: What value added do you offer?

CEO: I also offer training even at the beginning [before they buy] to convince them that they will not be by themselves after buying the product so they know that the training is possible. So I can come with the equipment and train them as well. But, I am always telling them that it is very simple to use and not complicated. So the proposal is that I give them some time, say two weeks, and I will do a session after that time and if they have any doubts or questions it is not a problem. For them will not ask sometimes because they found for themselves it is really easy to use. If you buy the book with experiment proposals they find for themselves. I try to show them build an image of something bigger for teacher, I can help with simple problems. For example I am a trained engineer so if there are minor problems I can fix I will do it here on Poland. Build a local image of local service. Teacher see that we are taking care of them in Poland. All the additional service I can do for them is better,

Researcher: Do you engage in marketing directly in Poland?

CEO: Yes, we do that. It has been to the private schools last year. The state schools have not money to spend now. We must wait until they are ready again.

Researcher: How is equipment purchased by schools?

CEO: It is purchased by schools directly. They are given a budget and they must spend it on what they need. The teachers do have some control over what they want to get.

Researcher: What are the educational backgrounds of the key employees here?

CEO: Mine is an engineering degree with a teacher's conversion degree. My wife is a pharmacist.

Researcher: Are any of them with a science degree or have experience of teaching?

CEO: Yes, I have for some years in a technical college.

Researcher: How do you see the company then rebuilding the sales and engaging with teachers?

CEO: We must work to our own strengths and then the strengths of others with us. Working the same as the German model is a good way. We have the technical aspects that the local distributors have the distribution potentials. The sub-dealers we will talk to are a good potential because we will bring the technology in education to their ranges.

Strategic Selection

Researcher: What market segments (that is, primary, secondary, high school, university) do you specifically target and why do you do so? If you do not specifically target some markets, what is your general approach to selling Genisys?

CEO: It will be secondary schools because I am from that environment.

Researcher: It is clear that your company is very much aligned with your strategic competencies and internal competencies for the industrial market, but how will you align your resources now to take advantage of the educational market?

External seizing

Knowledge management

Researcher: How is knowledge shared or generated in the firm?

CEO: By collocation with customers and outside helpers.

Co-ordination

Researcher: What are the division of roles and responsibilities in the company?

CEO: You mean by my wife...? Yes she does the accounting and discuss this with Mary. The tax system is over engineered and it is good she does this for me. If I have to attend a conference or a meeting, in this time I can rely on her to be here in office.

Researcher: How do you adapt the knowledge externally? Is she learning more about the market?

CEO: She could be more active. She makes notes on how use the equipment and about experiments. Up until now everything OK and we are able to use the equipment without more support.

Researcher: Do you share knowledge in the company

CEO: Yes, we do. She [wife] will want to know about key customers.

Researcher: Do you have database?

CEO: I do not have specific tools to handle the databases, I use Google docs as that is adequate for me.

Researcher: Do you see any similarities with the educational market?

CEO:

Integrating knowledge management

Researcher: How is market knowledge integrated into the company?

CEO:

Researcher: Do you employ anyone who has been an educator in a science classroom, or is still involved directly in education?

CEO:

Researcher: If you do, can you give a very brief outline of their background in education in terms of number - how many years' experience and their specialist subject areas?

N/A

Researcher: Define the contribution of the science educators in the company (e.g. do they provide feedback from the market? Are they part of marketing and strategic planning meetings?)

CEO: N/A

External re-configuring

Resource cognition

Researcher: How do you access your own internal market knowledge?

CEO:

Researcher: How are your competitors doing?

CEO: If you look on the Polish eBay you can see lots of low cost competitors. They are cheap and not good.

Researcher: what is your marketing approach?

I use quality which is the real strength in my opinion, the innovation and the large number of sensors which you can connect to the one instrument. Portfolio of product and 5 year warranty. Last year I am trying to show them the wireless sensors and it is possible to show them with Android device – which is all the have to buy. Also good support. The teachers here, I would say, are lazy they do not have to the desire to spend much time understanding the use of the product so quality is important.

Researcher: What are your own technological needs in the company?

CEO: I am using a “Google accountant”, there I have all of my information on this web based company. So, if I am talking to a customer and they have a problem I can refer to that. It works and you don’t have to think about it.

Recombining

Researcher: How do you combine your internal and externally gained knowledge?

CEO:

Do you look to use innovative ways to combine external knowledge of the market, customers or competitors with the internal knowledge you already possess?

CEO:

Technological resource base

Researcher: Do you have skills or knowledge in curriculum design and/or innovation? Can you give some brief examples?

CEO: Only in translations. I have started to make changes and translations for the experiments and I am working slowly through that.

Researcher: Do you translate software into local language?

CEO; Yes, LabQuest is on Polish.

Researcher: Do you translate some or all of our experiment manuals?

CEO Yes, I am doing. I have the most popular experiments in Polish. I also tell them to, that if I have not translated the specific experiment they want – I tell them to read the English version and with the many diagrams there they could use the imagination and be able to follow it.

Researcher: Do you modify them to suit the local curriculum?

CEO: yes, so that is what I do. I have translated more than 50 of them for the most common

Researcher: Do you think localisation is important? How important (scale of 1-10?)

CEO: Maybe 8 – but not 10. High for sure, but not critical.

Researcher: Does your firm have the pedagogical skills to advice on curriculum design and implementation?

CEO: No, we do not have these skills. We hope to get them by using some teachers as consultants for us.

Researcher: Do you have any part-time teachers who work with you?

CEO: Yes, I have. I have some very good contacts in the East of Poland – there is a good university there. I have a good person working in science education. She is focussed on the education of kids. I am trying to co-operate with her and she is also an important customer as she likes the quality of Genisys. We agreed that I would try to support her with good prices but she agreed that would like to reach more kids. SO she think is about a bus with experiments in it. If goes according to plan she will take this bus around Poland and show kids science experiments using Genisys. She plans to reach schools one by one. Poland is not a rich country, it is rather poor. We are somewhere like Ukraine, or Slovakia something like that. She explained to me that it is a problem for schools to organise transportation to go anywhere; they are watching their money closely. They are not even able to visits the science centres where there are well equipped laboratories. So she said we will come to them, we will bring the laboratory to them. The idea to try and help schools. I was pleasantly surprised as I have to admit it was not my idea to do this. It was born after discussions about the problems that are facing the schools in Poland. This innovative way might be a big help. I will try and support with prices and whatever I can do.

Researcher: Working with teachers like her would be a big advantage?

CEO: It is hard to find teachers like her. But you are right, more like her would be very beneficial.

Competitive advantage through innovation

Researcher: What are the most important factors needed for you to enjoy a competitive advantage in your market?

CEO: Fully translate the LoggerPro and the experiment manuals. LP is so expensive and it does not fit with picture of Genisys.

Researcher: Is there an importance to having the leading innovative products in the market?

CEO: Yes, as we have said before.

Researcher: Is there anything you can do locally go assist further in innovation?

CEO: Yes. We must give good service and making partnership with some other dealers will be one way. I can provide the technical backup and help and also the resource material and they can be the sellers. The two sub dealers I am going to start with do not have datalogging just the normal science equipment ...we can together be better...I can offer them the new technologies and they can bring me the schools in their territories... I think this is a good partnership.

Researcher: How do you market your products?

CEO: Through website and through advertising in schools newspapers. The adverts in school newspapers are not very effective.

Researcher: What is your opinion on the value of doing workshops for teachers?

CEO: Yes, very effective. As I said before, my friend who always does workshops for kids and teachers is very valuable. Teachers are able to pick up the equipment and use while there is another teacher who is knowledgeable there to show them. This is the best way – it is difficult to be able to explain these feature on an advert page.

Researcher: Are workshops an effective method of selling?

CEO: Yes they can be. If customers can see it as hands-on it is easier to pass on the message. On a catalogue page is hard...but maybe on a website where you can run video maybe different. It seems like teachers like to be shown it as I do not think they will give the time to watch the videos.... Those

in the private school where you have to pay fees maybe... Well the Kopernicus science centre in Warsaw have a really lot of Genisys and they have a team of educators [boundary agents] who are always working with demonstrations for schools that visit there every day. They only use Genisys and so they [boundary agents] will tell the teachers where they can get the Genisys. This is the most effective selling opportunities I have.

Researcher: Where have you positioned the Genisys range in the market (for example, the quality premium end, or low cost end?)

Indicator variables

Researcher: How do you track ideas in the company?

CEO: I will talk only with my wife who helps me. I always call you [the researcher] when I have an interesting possibility and we discuss together what to do.

Researcher: If you need together external knowledge, how do you do that?

CEO: I would also talk with you [the researcher] to see if you can help. I also use the teachers who are customer who I have become friends [boundary agents]. It is also usual to attend conferences and talk there to teachers and potential customers. It is important that we are ready when the situation changes in Poland and when the educational system is decided. So until then we must get the right message into the market.... Poland is good at getting grants from EU and we need to be aware of when that influences education. It is difficult when teachers are not so sure either....we can be helpful to them should we discover some important facts about what is going to happen.

Researcher: What methods do you use to increase brand awareness and market penetration?

CEO: We have send catalogues mostly to the international schools because they have the money to buy. It was successful for us and we got some sales from it. We are well known in this community....but unfortunately... these teachers stay in these schools and do not go the state run schools...so we have no leaders of our products doing there.

Researcher: Do you have any links with influential external stakeholders?

CEO: Not so much. We have some good friends in universities and private schools. We do not have any contact with ministry as they have no direction right now....so it is waste of energy.

Researcher: Would you prefer a more proactive feedback and discussion links with Genisys?

CEO: Yes, it would be good to have more help with how to promote the products better. This is not my area.....I am more of an engineer.....yes.....it would be excellent to work more closely.

Researcher: Thanks Rafal! Do you have any questions for me?

CEO: I think we should implement what we discussed and we can talk again in a few weeks? But I do not have any questions. Good luck with the study.

Appendix D

Group Statistics					
	Are you a current user of data acquisition technology products?	N	Mean	Std. Deviation	Std. Error Mean
Q12	Yes	2895	4.8684	1.55601	.02892
	No	482	4.3361	1.60402	.07306
Q13	Yes	2886	4.9851	1.49573	.02784
	No	484	4.3306	1.56641	.07120
Q26	Yes	2899	4.6478	1.71658	.03188
	No	485	4.5113	1.64843	.07485
Q27	Yes	2899	5.1214	1.59226	.02957
	No	488	5.4262	1.42243	.06439

The following test is the independent samples t-test based on the four questions posed in the online questionnaire was most relevant to the study. The following questions were evaluate and compared against two independent groups: (i) users of datalogging technologies, and (ii) non-users of data logging technologies. The following Table presents the results of the independent t-test for all four questions:

- Q12. People who influence my behaviour think that I should use data logging technology in my class.
- Q13. People who are important to me think that I should use data logging technology.
- Q26. I would be more convinced to purchase data logging if recommended by another teacher.
- Q27. I would feel more comfortable buying data logging technology if I attended a workshop conducted by a current or retired teacher.

All questions returned a value for **Sig.(2-tailed)** <.05 (that is, $p < 0.05$) for Levene's Test there is a significant differences between both groups (users and non-user of datalogging technologies). Therefore, the null hypothesis that should be no significant differences and any difference are through

pure chance is rejected. Indeed **Sig.(2-tailed) <.05** (that is, $p < 0.05$) remains consistent for all four questions, accordingly there is a statistical difference between the two groups.

Since **Sig. (2-tailed) < .05** for Levene’s Test, therefore the assumption equal variance has been violated. Hence, the t – value will be for the calculated ‘Equal variances not assumed’. Therefore, $t = 6.774$ in the case of Q12 and follows a similar pattern for the remaining questions (t values in bold).

Since **Sig. (2-tailed) < .05**, there is a significant difference between users and non-users of data logging technologies.

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Q12	Equal variances assumed	4.431	.035	6.923	3375	.000	.53229	.07689	.38154	.68305	
	Equal variances not assumed			6.774	640.916	.000	.53229	.07858	.37800	.68659	
Q13	Equal variances assumed	4.192	.041	8.848	3368	.000	.65452	.07398	.50948	.79956	
	Equal variances not assumed			8.561	639.505	.000	.65452	.07645	.50440	.80465	
Q26	Equal variances assumed	5.491	.019	1.630	3382	.103	.13647	.08374	-.02772	.30066	
	Equal variances not assumed			1.677	671.849	.094	.13647	.08136	-.02328	.29622	
Q27	Equal variances assumed	37.487	.000	-3.970	3385	.000	-.30481	.07677	-.45533	-.15429	
	Equal variances not assumed			-4.302	708.814	.000	-.30481	.07086	-.44392	-.16569	

Questions 12, 13 and 26 shows a significant t-value difference from the hypothesised mean values (Table XX). These questions all show positive values for t of 6.7, 8.6 and 1.7 standard deviation units away from the centre of the normal distribution curve, hence it is unlikely that they could have

occurred by chance (As an example, Q12 the probability of obtaining a t-value of 6.7 or higher, when sampling from the same population with a hypothesised mean in the range of 4.3 to 4.8 is 0.035). Question 27 show a negative value of $t = -4.3$, $p < .05$. The same interpretation can be applied as in the previous questions, except extremeness of the t-value is to the left rather than the right of the distribution.

In conclusion, since $p < 0.05$ in all cases we reject the null hypothesis and conclude that is a statistically significant difference. Between both groups. Also, by the magnitude of related t-values, it is concluded that there is a statistically significant effect as to whether you are a current user or non-user on a potential customer to purchase the product under the 4 conditions outlined in Questions 12, 13, 26 and 27.

Now that a statistically significant effect has been identified, the next step will calculate the magnitude of that effect.

Group Statistics					
	Are you a current user of data acquisition technology products?	N	Mean	Std. Deviation	Std. Error Mean
Q12	Yes	2895	4.8684	1.55601	.02892
	No	482	4.3361	1.60402	.07306
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	No	484	4.3306	1.56641	.07120
Q26	Yes	2899	4.6478	1.71658	.03188
	No	485	4.5113	1.64843	.07485
Q27	Yes	2899	5.1214	1.59226	.02957
	No	488	5.4262	1.42243	.06439

Eta Squared for One-Way ANOVA

SPSS provides a facility to calculate Eta Squared (η^2) under ‘compare mean – one way ANOVA’ option. SPSS refers to this as “Measures of Association” rather than “effect size”, but is the same calculation.

For Q12 (People who influence my behaviour think that I should use data logging technology in my class) shows $\eta^2 = 0.014$ or 1.4% of all variance is attributed to being a user or non-user;

Q13. People who are important to me think that I should use data logging technology, shows $\eta^2 = 0.023$ or 2.3% of all variance is attributed to being a user or non-user. All effect sizes are summarised in Table XX

According to Cohen (1988, pp. 284-7), an interpretation of the effect sizes can interpreted as:

.01 = small effect

.06 = moderate effect

.14 = large effect

Measures of Association (effect size)			
Question	Eta	Eta Squared (η^2)	Cohen's Scale Effect
Q12 * Are you a current user of data acquisition technology products?	.118	.014	Small
Q13 * Are you a current user of data acquisition technology products?	.151	.023	Large
Q26 * Are you a current user of data acquisition technology products?	.028	.001	Small
Q27 * Are you a current user of data acquisition technology products?	.068	.005	Small

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig. (<i>p</i>)	Statistic	df	Sig. (<i>p</i>)
Q1	.313	3402	.000	.600	3402	.000

Q2	.296	3404	.000	.654	3404	.000
Q3	.314	3382	.000	.775	3382	.000
Q4	.191	3395	.000	.921	3395	.000
Q5	.292	3375	.000	.833	3375	.000
Q6	.336	3394	.000	.725	3394	.000
Q7	.334	3384	.000	.738	3384	.000
Q8	.345	3390	.000	.717	3390	.000
Q9	.314	3390	.000	.670	3390	.000
Q10	.297	3397	.000	.702	3397	.000
Q11	.326	3382	.000	.733	3382	.000
Q12	.237	3390	.000	.884	3390	.000
Q13	.251	3383	.000	.876	3383	.000
Q14	.362	3381	.000	.747	3381	.000
Q15	.342	3382	.000	.765	3382	.000
Q16	.339	3385	.000	.717	3385	.000
Q17	.360	3388	.000	.694	3388	.000
Q18	.362	3382	.000	.673	3382	.000
Q19	.351	3372	.000	.692	3372	.000
Q20	.340	3381	.000	.698	3381	.000
Q21	.385	3386	.000	.740	3386	.000
Q22	.376	3388	.000	.764	3388	.000
Q23	.354	3390	.000	.792	3390	.000
Q24	.380	3381	.000	.734	3381	.000
Q25	.308	3383	.000	.829	3383	.000
Q26	.277	3396	.000	.865	3396	.000
Q27	.331	3400	.000	.826	3400	.000
a. Lilliefors Significance Correction						

Average	0.3227037
Highest	0.385
Lowest	0.191

Comments of Normality

The test of normality in all of the questions is Kolmogorov-Smirnov. Sig. value greater than .05 indicates that there is a violation of normality. According to Pallant (2013, p. 66), this is normal in large samples.

“...The Kolmogorov Smirnov test produces test statistics that are used (along with a degrees of freedom parameter) to test for normality. Here we see that the Kolmogorov Smirnov statistic takes an average value .322 (highest value 0.385, lowest value 0.191). This has degrees of freedom which equals the number of data points, namely ~3400

Here we see the p -value provided by SPSS (quoted under Sig. for Kolmogorov-Smirnov) is .000 (reported as $p < .001$). We therefore have significant evidence to reject the null hypothesis that the variable follows a normal distribution.

Although both these statistics tell the researcher whether the distribution followed by a variable is statistically significantly different from a normal distribution one should take care in not overinterpreting such findings. Significance will be strongly affected by the number of observations and so only a small discrepancy from normality will be deemed significant for very large sample sizes as may be the case here whilst very large discrepancies will be required to reject the null hypothesis for small sample sizes. It should also be remembered that many parametric statistics are robust to non-normality when sample sizes are very large (employing the Central Limit Theorem), so the implications of non-normality are primarily of interest in designs with smaller sample sizes...”
(The British Academy, n.d.)

Taken verbatim from The British Academy paper – where only the values have been changed to reflect this study (<https://www.bristol.ac.uk/cmm/media/research/ba-teaching-ebooks/pdf/Normality%20-%20Practical.pdf>) (Last accessed Dec 2021)

Appendix E

RQ1: How does knowledge integration through customer orientation and boundary spanning influence VRIO resource configurations?

RQ1 focuses attention on knowledge generation and codification mediated through focused customer boundary-spanning activities. Table 5.5 summarises the analysis of RQ1 with the associated tree and associated daughter nodes.

1 Tree Node: Boundary Spanning activities

The first tree node to emerge was that of boundary agent activities and their activities in spanning the boundaries between supplier and customer (Figure 5-21).

Table 0-1 – Boundary agents and boundary spanning-tree node

Daughter Node	Tree Node: Boundary agents knowledge generation
1	Codification of knowledge through boundary spanning
2	Importance of using teachers to help the promotion of products
3	Attendance at teacher conferences
4	Training for teachers
5	Using teachers in the firm
6	Workshops for teachers
7	Behaviour of stakeholders
8	Receptivity to information by the firm

1.1 Daughter node 1: Codification of knowledge through boundary agents.

One of the most valuable sources of information comes from using boundary agents conducting workshops, sometimes with the assistance of a specialist salesperson. Eleven of the thirteen case-study firms placed a strong emphasis on the utility of boundary agents mediated workshops. The CEO of PC12 (Croatia) considers the feedback as being invaluable:

“...After every workshop.... they [boundary agents] always tell us the comments of the teachers in the workshop. If there are some aspects of the equipment that needs to be made better, or cheaper, they feed that back to us. They are important for this kind of information. We would not be able to get this by the usual marketing ways...”

PC5 (Germany) also heavily relies on boundary agents as a means of finding out important marketing information and correctly localising the products:

“...They are always feeding me valuable information about competitors and changes that are happening. When we do translations into German of the software programmes there can sometimes be bugs or errors not there in the English version. I cannot check all features on my own, so I rely on these teachers to help...”

Knowing what is being planned at government level and how to address the impending needs correctly requires knowledgeable boundary agents who also have influence. Prior warning leads to first-mover advantage and the potential to ensure that equipment specifications are issued in a fair and correct manner. PC8 (Turkey) are in close contact with their network of boundary agents and take every recommendation seriously:

“...Ideas can come from outside teachers [boundary agents].... they very often make suggestions when we meet them. If the suggestion is good, we will have a meeting of managers to see what we can do...”

1.2 Daughter node 2: Importance of using teachers to help promotion of products.

Using schools where boundary agents are teaching as a facility for workshops is a very effective strategy in the Czech Republic. The firm (PC2) regularly engages in ‘road-shows’ around the country and invite neighbouring schools to visit the hosting school. The firm finds those host teachers [who are boundary agents]:

“...like to lead the workshops, and we are just there for technical support in case there is a problem with the equipment. We just walk around the room and help the teachers [customers] work through the experiments making sure that they can follow the instructions. Sometimes we can sit and chat with a group if they have finished an experiment quickly and we find they are relaxed and give us information that can be very useful...”

PC5 (Germany) further emphasise the importance of using boundary agents:

“...This [using boundary agents] is one of the most important reasons for sales. If we use our group of teachers [boundary agents] from T3 [a teacher network], it is even more effective. This

is because teachers are talking to teachers, and they are free and talk openly...It is also great for feedback on what is happening in different areas. Sometimes teachers will bring a catalogue or special offer leaflet from our competitors, so we can see what is happening. It also.... helps with innovative ideas that can be really good to use..."

PC3 (Holland) also recognise that "...teachers sell to teachers..." and that the credibility is far greater than a professional salesperson. The main criterion used in the selection of salespersons is that they have had a background in teaching at a senior level, but their subject specialisation is less important:

"...We prefer people who are in direct contact with teachers to have been teachers themselves first, even in senior positions and who have retired from teaching. We find these people effective. As I mentioned before all of our salespeople have been teachers – up until now their teaching background was not really relevant..."

1.3 Daughter node 3: Attendance at teacher conferences.

All of the case companies recognised the importance of being active in attending teacher conferences as emphasised by PC2 (Czech Republic):

"...This is very important, but we have found, or we realised that more effective than doing a workshop is to make a show to teachers, so we prepare something like 9/10 minutes some of the great/nice experiments, and we show this to people we try to make it interactive, so they sometimes can touch something, but it is not just workshop where they just sit around, and we go around them. This works for us great. It is very important to be there physically and for them to touch Genisys..."

This is a common theme with all distributors, although not all conduct workshops. Others see such conferences as a "...flag-waving exercise..." and "...once you become a regular exhibitor, you have to keep attending, or customers and competitors think you are in trouble..." (PC4, UK).

Conferences are seen as essential places to "...locate influential teachers..." (PC7, Slovakia). The same teachers tend to always visit the conferences, and "...it is where I can identify such teachers I can work with, or I need to know..." (PC7, Slovakia). Moreover, the more important schools are represented here, so "...the main possibility is to enter any possible conference and meeting of teachers, this is first. Slovakia is a small country, and if we have an important school that uses and really likes Genisys another school will see it and wants to use and buys it also..." (PC7, Slovakia).

1.4 Daughter node 4: Training for teachers.

After-sales training is regarded as paramount by all of the respondents and considered a bad reflection on their firms if the equipment lay idle and not in use. The importance of after-sales service for customers after they have purchased is endorsed by all of the case-companies. PC9 (Belgium)

considers the ability to provide post-sales training to be, not just of practical benefit, but good marketing:

“...It shows I think that you cover the whole spectrum of services that you offer to a school. It shows not just good marketing but demonstrating products. You can sell the products; you can do after service. It shows that you see the importance of having the whole solution for a school...”

In a similar vein, PC13 (Estonia) insists that the customer need to get the full value from the equipment to be better educators:

“...Yes, training is very important. So, it's OK teachers will get the device but what will happen after more from this device, and I think training is very important and we offer it when we make an offer to a school. If it is a new school for us, then I offer always training so I will go and do onsite training...”

The approach taken by PC7 (Slovakia) is to invite neighbouring schools when they visit one particular school to do after-sales training. The school is happy to host this as it increases its standing in the educational community. The benefit for PC7 (Slovakia) is that they have a captive audience:

“...I am always looking for people at the conference who are more tuned in than most. I will target their schools to visit and do a workshop. You can send tens of thousands of e-mails, mailings, but you show the teachers what the product can do. Sometimes 15 minutes are enough...”

1.5 Daughter node 5: Using teachers in the firm.

PC12 (Croatia) rely heavily on boundary agents in the firm. Often, their intervention can make the difference between success and failure:

“...As you know, there can be a six or eight-month cycle to present products to teachers and for them to get the funding to buy it. So, you can get confused about where the idea to buy the products started. However, when teachers are employed by us to present, you can see that the effect is almost always to buy...”

One of the critical aspects of this study is reported in this daughter node, “*Using teachers in the firm.*” The term teacher used here is in the context of the boundary agent, which was defined as a person who was, or is, either a full time or part-time science teacher who is employed by the local distributor. The role they fill can be as a sales role, or a supporting role, but must have customer contact through giving of workshops or direct selling. In all of the smaller distributorships, the owner/CEO was a former educator.

1.6 Daughter node 6: Workshops for teachers.

Workshops in this context refer to a sales activity, where groups of teachers are brought together to obtain a demonstration of the products and have the opportunity for “hands-on” activities. On-site training is distinct from workshops as it is delivered as a consequence of a sale of the equipment. The utility of conducting workshops is that there will be several schools brought together in a central location, which is more time-efficient and cost-effective for the distributor. In all cases, workshops are conducted by boundary agents. PC12 (Croatia) refers to the relaxed atmosphere created and “...because they are all teachers, and they talk as equals and openly...”

The workshop approach is particularly suited in the Finnish context as the geographical location of schools means that it is not possible to visit them all conveniently. Accordingly:

“...workshops are a very effective and best way to give teachers a chance to try themselves. Some teachers are worried that their ICT skills are not that good, but when they see the equipment in a workshop, it helps them with this concern. I can collect data using computers so that we can show them...But, what is more effective, is when groups of teachers organise workshops without me even knowing...”

The view from the Dutch distributor is that workshop activities are extremely effective:

“...it is a very important way to sell data-logging [a science teacher device which captured data quickly and accurately]. This product is hard to sell off a page of a catalogue if you are new to the technology and want to consider using it. It is difficult to be able to hold workshops all over the country, so a network of enthusiastic teachers who hold small regional meetings themselves is a real benefit for us... We do not even know about these meetings most times. Sometimes we are invited if the meeting is quite large, or if there are a few schools interesting in buying. In this case, they just need us there for pricing and so on...”

This, information gathered in workshops environments can have profound effects on the firm’s capacity to become more attuned to the needs of the customers and become more aware of feedback in the future.

1.7 Daughter node 7: Behaviour of stakeholders.

All respondents were clear in their assertion that the key stakeholders are the teachers themselves as customers. The other category of stakeholders is government officials in their respective ministries of education and school managers (or principals). The school principals are seen as the gatekeepers that must also be recognised if a successful sale of equipment is to be realised. The importance is emphasised by Croatia in the special treatment afforded to them:

“...We bring them [head teachers] together for a day and show them what technology is new and give them a preview before anyone else in Croatia. This makes them feel good and special, and they are then more likely to engage with us. It has taken some years to build this trust and relationship, so they see us as a company trying to help them...”

The school then becomes more engaging, and the prospect of a higher level of support is made available to the teachers from the management. The importance of relationship at the Ministry level is endorsed by PC1 (Ukraine):

“...I think.... that the most important...excluding the customers [schools] are the curriculum authority in the ministry [of education] in Kiev. They command what is needed and we must be sure they know of our solutions...”

The ordering of equipment must first be approved by the ministry, which is tightly controlled and may even be as specific as dictating a particular brand of equipment to be purchased. A similar process occurs in Turkey, where ministry officials can exert influence over the equipment to be procured through tendering. PC8 (Turkey) emphasise the importance of having existing relationships with influential teachers who act as advisors to the ministry:

“...Sooner or later, the ministry will ask certain educators to evaluate these new products, and that is when we find out! I do not think they are doing anything wrong, as nothing in this is confidential and they are asked to make sure that the specifications make sense for Turkish schools. Our only problem after that is the underhanded dishonesty that can take over...”

The influence of boundary agents can also extend to large and significant contracts. PC7 (Slovakia) explained that they were able to win a vital tender and overcome some corrupt practices because of the relationship with key stakeholders in the ministry.

“...I was able to use my old chemistry contacts at the university, and some of them were also on the evaluation committee. Of course, we know that [our equipment] is a superior solution, but that is not always enough. Where large EU projects are concerned, there is more than you have to do to be successful. I made many phone calls to have the committee reconsider more than just one brand (as they had been doing with our competitor). It was just unfair and perhaps illegal because of EU procurement rules. But I never did threaten that action. I just relied on my knowledge of teaching and the reputation I have established over many years in Slovakia...”

1.8 Daughter node 8: Receptivity to information by the firm.

Seven of the thirteen case companies placed a strong emphasis on strategic decisions taken because of information from boundary agents. PC8 (Turkey) comments on the need to be receptive to market intelligence from boundary agents:

“...they [boundary agents] are key information carriers for us. The part-time teachers [boundary agents] we use are in the middle of things happening. They are always in contact with any new initiatives and developments. We need their input as much as we need their help at big conferences. In very seldom occasions will they be part of our own internal strategy meetings. That does not mean they are not welcome, or we have something secret to discuss, it is more because we need to keep the professional relationship so that we can hear the good and the bad about what teachers think of us...”

When discussing the importance of codified information regarding success in the tender process, P22 [a boundary agent] stresses that it is critically important that the firm correctly understand the unique circumstances around each tender:

“We give this information back to PC12 about what we are told and advise them on how such information can be used to good effect...” (Croatia).

2 Tree Node: Boundary agents & boundary spanning

This tree node explains the critical market intelligence gathered by the boundary agents assists the case-study SMEs in recognising significant opportunities and thus develops better capabilities to seize opportunities. The findings will draw from eight different daughter nodes, as shown in Table 0.2

Table 0-2 – Tree nodes associated with boundary-spanning activities.

Daughter Node	Tree Node: Boundary agents & boundary spanning
9	Boundary agents influences.
10	Importance of localisation.
11	The process of localisation of products.
12	Boundary agent roles in resource configurations
13	Competitor’s activities and competitive advantage
14	Customer feedback and customer focus
15	Generative sensing through boundary spanning
16	Sales professional activities – the specialist salesperson
17	Workshop activities for knowledge generation

2.1 Daughter node 9: Boundary agent's influences.

The importance of using teachers in the firm is confirmed by the majority (10) of the distributors. PC13 (Estonia) report that they have worked with boundary agents for many years and that "...teacher-to-teacher..." interaction is pivotal to their success and competitive advantage. The capabilities brought by the boundary agent is summarised by PC10 (Finland):

"...It is important for teachers to see that there is a connection to the classroom, so teachers performing workshops will be better informed as they know how the product works in the classroom. In what works and what does not work..." (P17)

PC9 (Belgium) refers to the importance of boundary agents because of the nature of how business is conducted in their region, where the teachers have more autonomy in what they purchase:

"...The school decides whether there is a budget or not, but it is the teachers who decide what materials they like or what materials they do not like so really organising workshops before a school knows the technology is very good, also very effective afterwards when a school requests quotes and we '...say there is a free workshop [with boundary agents] after you have ordered our equipment...' the teachers really appreciate it..." (P16)

In a similar vein, PC2 (Czech Republic) refers to their established network of customers and boundary agents that can both assist in technical support and offer advice on what to purchase to a prospective customer:

"...What is very important is if some teacher is to buy [our equipment] or something else they know that if they buy [our equipment] and they have a problem they know the person will ask for help, and now after a few years we develop our market it is also important that there is a really big community of teachers and schools who use [our equipment] so it's really easy for us to send an email to almost every city in the country, and I can tell them ok next to you is two schools who have this you can go there and try it, talk to these people, and this really works..." (P3)

2.2 Daughter node 10: The importance (or otherwise) of product localisation.

Every distributor stressed the importance of product localisation on a scale of 1 – 10 (where ten is most important). Every case-study SME ranked the importance of localisation of products with at least a score of 8.

“...8/9 – Very important, our customers I do not think are scared, but they are challenged when the solution is not in their language. The manuals are not that important, but the experiments like the readymade manuals and especially the software... .. should be localised....” (PC9, Belgium)

“... Some rules in Slovakia, there have to be certain documents supplied with a product that is translated into Slovak. So, I would say 10 - the most important. Software maybe not so critical. So, for software introduced to primary schools, it needs to be in Slovak. So, overall, for software, I would rate at 9...” (PC7, Slovakia).

The ability of the local firm to localise the product, not only in terms of language translation but to match against the local curriculum, is an essential resource that can be categorised as a VRIO resource. However, the ability of rival firms to offer a similar localisation is also possible, hence this resource can only confer a temporary competitive advantage.

While the building of VRIO resources is important for the firm, regarding skillset, knowledge gathering or customer service, the quality and fit ‘for purpose’ of the product range is a particularly critical factor. This tree node establishes the importance of localisation from both the customer and the distributor’s point of view. Since the localisation of the products is undertaken by the local distributor regarding the translation of software into local language and adaption of curriculum material to suit the local requirement, a specific set of VRIO resources, therefore, needs to present. The technical salespeople working with knowledge brokers (such as boundary agents) in a customer-focused way combine to add value to the customer. The necessity of adding value in this way is emphasised by PC2, who combine the resources of their technically competent salespeople with input from boundary spanning activities to re-write the educational support materials:

“...We do not want to translate...original books because they are not well connected to our curriculum...so we create our own....” (PC2, Czech Rep).

PC2, together with almost all of the non-English speaking countries, take this approach to varying degrees. PC1, PC7 and PC11 go as far as translation of user manuals, warranty labels, technical information libraries (TILs), training videos etc. The case-study firm considers this attention to detail to customer focus one of the main reasons (outside of the quality of product) that customers seldom switch away to another competitor. The participants all agreed that the combination of resources that have been developed over time to recognise these specific customer needs added value in a way that could not be easily imitated by rivals.

2.3 Daughter node 12: Boundary agent roles and activities.

The role of boundary agents is emphasised more in the smaller SMEs. Since the majority of the case companies’ owners are from an educational background, this is hardly surprising. The findings show

that the roles attributed to boundary agents and boundary spanning include workshops activities; advocacy in public procurement; information gathering and codification; preparation of local curriculum materials; localisation of products (software translations); recommendation to colleagues; arranging regional teacher meetings; and, design suggestions for new products.

The findings show that workshop activities by boundary agents are the prominent contributor to the firm's knowledge capability building. Eight of the case companies relied heavily on the credibility brought to the firm through the agency of boundary agents. PC5 (Germany) report that the credibility factor is an essential determinant in convincing customers of the utility of data loggers:

"... We have two former teachers directly employed. Teachers have more credibility in turning up. Teachers will be accepted more, and they have the feeling that they (the customers) are being trained by insiders and that somebody is coming that want to pass on the knowledge, not just somebody who is a salesperson just turning up to make a sale You can be accepted by the teachers if you are seen as an insider..." (P7)

PC10 (Finland) use their extensive contacts who are ex-colleagues of the CEO:

"...as we are a small company, but I have good friends who are teachers around Finland, whom I can directly speak to, share worries, and ask their opinions—using external resources as a backup. I have a small network of teachers at different schools. I am very much alone, but then I have these networks of teachers that I use..."

PC2 (Czech Rep) have built clusters of communities developed through an extensive network of boundary agents that have now become self-supporting and self-perpetuating:

"Communities of teachers help support each other too...we teach teachers how to conduct great experiments with our knowledge...but they might not necessarily follow the textbooks.... What is very important is if some teacher is to buy [our equipment] or something else they know that if they buy [our equipment] and they have a problem they know the person will ask for help, and now after a few years we develop our market it is also important that there is a really big community of teachers and schools who use [our equipment] so it's really easy for us to send an email to almost every city in the country, and I can tell them that next to you is two schools who have this you can go there and try it, talk to these people and this really works..." (P1)

The emphasis on boundary agents from PC4 (UK) is more ad-hoc. There are no formal relationships between the firm, and boundary agents and collaborations are minimal. The level of engagement is focussed on the teacher organisational level and is more marketing focussed that less emphasis on customer support:

“...using those people from the Association for Science Education (ASE) and the people from the Royal Society of Chemistry (RSC) and people like that - the former teachers who have roles in that we liaise with those quite a bit. Yes, there is value in that...” (P5).

The effect of losing boundary agents is highlighted by PC8 (Turkey) referencing the recent political turmoil in their country:

“...Since our new government [spending] has slowed down and our education community has been damaged. Some of my friends have left their posts in universities. We [together with boundary agents] were very active in meeting with universities, schools and working with curriculum materials. We held regular conferences and workshops to attract as many teachers as possible to have a chance to play with the equipment...” (P14)

The scarcity of funding in Ukraine places a greater emphasis on competitive advantage offered through the mediation of boundary agents:

“.... This has big value for us. The outside teachers [boundary agents] are more relaxed than us, and they just continue to do experiments like they would in their classrooms. They also like to tell of tips and tricks they have found to do an experience [experiment] using the data loggers. For them [boundary agents] they are representing themselves and also their school as well as our products when they perform these workshops. The school director [principal] also likes this because it shows that their schools are innovators and at the leading side of things...” (CEO, PC1)

2.4 Daughter node 13: Competitor activities.

Most of the respondents monitor the activities of the local competitors closely and use that information in building their knowledge base. For example:

PC2 (Czech Rep): “We try to keep an eye on them, I think that we have maybe five important competitors at the moment, and the biggest one is Competitor A..... I think it is very important to be at their conferences and workshops not only to get information but also to let them know that we are there so that they do not say things that are not true. It is important just to sit there and smile” (P2).

PC13 (Estonia): “I must say that I know my competitor very well. In Estonia, there is just one, in Latvia, there are two”, (P23).

Boundary agents also play a role in monitoring the activities of competitors and reporting their findings back to the firm. PC9 (Belgium) receives information on pricing, quality and marketing activities of competitors. PC4 (UK) take a more detached view of their competitors. The CEO stressed that the UK is a *“...very crowded market...”* and data logging was becoming a commodity product that is influenced more by price. Accordingly, the market focus has moved to the so-called

public schools [which in that peculiarly British way are private, fee-paying schools]. PC5 (Germany) face a similar challenge to the UK, where there are several indigenous manufacturers. However, through the extensive use of boundary agents' sales continue to grow at a rapid rate.

The challenges of competing against illegal practices in Czech, Slovakia and Ukraine are frequently alluded to during the interviews. The discussion is outside of the scope of this study; however, the impact of boundary agents is regarded as being an important factor in overturning adverse procurement decisions.

2.5 Daughter node 14: Customer feedback.

Information from customers (including boundary agents) about products and services is shown to be a key determinant in how the distributor operates. Customer feedback also plays an important role in building relationship between supplier and distributor, according to P3:

“... We can give you feedback on what we hear in Holland. If there are new sensors or price problems... We must know quickly about what you are bringing out that is new...until now we only know very shortly before it appears on the website.... and then everyone [customers & competitors] knows. A close partnership is essential for us with you...and we will try and keep that strong. We...of course...share important information with you because we also need have you also knowing what is happening so we can take on the challenges together...” (GM, PC3).

2.6 Daughter node 15: Generative sensing.

Purposively seeking information about the market is conducted different between the smaller SMEs and the larger firms. For example, PC12 (Croatia) employs a novel way to gather customers together for market research:

“...We arrange to have a workshop and small conference with influential professors [secondary school teachers] in Croatia once or twice per year. We bring them together for a day and show them what technology is new and give them a preview before anyone else in Croatia. This makes them feel good and special, and they are then more likely to engage with us. It has taken some years to build this trust and relationship, so they see us as a company trying to help them...”

The creation of a superior learning environment will leverage the effective use of resources and the firm's propensity to place value on generative learning (Baker & Sinkula, 1999). An example of this is again in PC12, where:

“...teachers at a workshop told us that they required some quick and easy experiments in the Croatian language. So, we asked one of our teachers [boundary agents] to design them with help from Genisys for screenshots....” (P20).

PC2 (Czech Rep) prefer to conduct a series of roadshows to present workshops and talk directly with teachers:

“...The host teachers [boundary agents] like to lead the workshops, and we are just there for technical support in case there is a problem with the equipment. We just walk around the room and help the teachers [customers] work through the experiments making sure that they can follow the instructions. Sometimes we can sit and chat with a group if they have finished an experiment quickly and we find they are relaxed and give us information that can be very useful...” (P3).

PC5 (Germany) distribute through a network of sub-distributors in addition to direct sales. Hence, their approach to generative sensing of knowledge involves close contact with their sub-distributors:

“.... We do have extensive knowledge of the market. We have management teams who look at how our competitors are doing checking financial databases, and they let us know what they find out from time to time. Feedback from sub-distributors and teachers is also a benchmark...if we discover something that we thought we should have known...or some information has taken us by surprise...it leads to meetings and consultations because we know we are deficient some way. It would be a worry to think that our competitor would have better market intelligence or better customer relations... that would make us think about what we are doing...” (P6).

PC1 (Ukraine) use workshops are effective generative opportunities:

“...When our salespersons are there in the workshop, they can just sit back and listen. They stay invisible, and customers sometimes forget they are there...they will not help too much with the demonstrations...only if a teacher calls them over to help. In this way, we can get a good understanding of how our customers think and how they might have worried...” (P1).

PC1 demonstrates how the specialist technical salespersons who can join in with the workshops remain quite invisible and are not intimidating to the customer. It is an example of how boundary agents can work in a professional sense with a technical salesperson. In so doing, they generate and facilitate a relaxed atmosphere to enable necessary value capture by relaying competitive information not easily found elsewhere.

2.7 Daughter node 16: Sales professionals’ activities.

In the semi-structured interviews, five distributors expressly referred to the role of sales professionals. The word “sales” was used 681 times in all of the interviews. The findings demonstrate that the role of the sales professional is regarded as being symbiotic with the boundary agent because of the technical nature of the data logging equipment. PC3 (Holland) view the role of boundary agents as being the “ground-breakers” and the role of the sales professional is to “...complete the deal...”

The importance of workshops by competent boundary agents is also emphasised along with the concluding role of the sales professional by PC3's GM:

"...this product [data-logging] is hard to sell off a page of a catalogue if you are new to the technology and want to consider using it. It is difficult to be able to hold workshops all over the country, so a network of enthusiastic teachers who hold small regional meetings themselves is a real benefit for us... We do not even know about these meetings most times. Sometimes we are invited if the meeting is quite large...or if there are a few schools interesting in buying. In this case, they just need us there for pricing and so on..." (P4).

Similarly, PC8 (Turkey) employ qualified technical sales professionals whose role is to cultivate relationships with boundary agents in their territory in addition to meet sales targets. PC8 have recognised the synergistic opportunities by employing former science teachers as technical salespeople:

"... our boundary agents and technical salespeople have one been colleagues, or they know each very well. They build strong relationships where they do favours for each other For example.... help each other out with loaning equipment is needed for teaching. When we hold workshops, sometimes the demonstrator [boundary agent] will be their own equipment. That really impresses our customers...."

The perception of boundary agents in comparison to sales professionals is eloquently expressed by PC5 (Germany):

"...I was standing with [my colleague] at the coffee bar, talking about the Graphical Analysis App. A teacher spontaneously joined the conversation. That went a while ... until he saw the Genisys logo on my shirt, and said to me: 'businessmen are bad, no matter what!' He disappeared, halfways friendly within the next 10 seconds..." (P6).

The participant (P6) was a former teacher, and recounts, when the teacher visited the exhibition stand and, after engaging with P6 asked if "...were you a teacher once?" The mood changed, and that teacher went on to place a large purchase order with P6.

2.8 Daughter node 17: Workshop activities.

PC3 (Holland) refers above to the difficulty in selling data logging from a catalogue page only. So, the utility of performing workshops where teachers can experience a hands-on approach is recognised by senior managers. The main function of the workshop is to allow customers the opportunity to test and work with the equipment in a relaxed and familiar setting mediated through boundary agents. This is elaborated by a boundary agent of PC12 (Croatia):

“...Teachers are invited. ...and I carry out experiments with my colleague [Suzi – another boundary agent] for the teachers who come. I write some experiments myself and also Suzi, and we do them. They are closely based on the Croatian curriculum, so they are of big interest to teachers...” (P19).

PC9 (Belgium) uses activities in workshops to present a holistic image for the firm:

“...It shows.... that you cover the whole spectrum of services that you offer to a school. It shows not just good marketing but demonstrating of products. You can sell the products; you can do after service. It shows that you see the importance of having the whole solution for a school...” (P16).

In Ukraine, PC1 ensures that workshops are conducted in a local hotel and provide a meal and refreshments for the delegates. Teachers usually stay for a while, and our company salespeople can freely engage with them. In this way, the customer feels privileged to be invited:

“...The only way to really engage with them [customers] is to do hands-on activities. We arrange small conferences around Ukraine almost every month. We invite schools from the area to come to the place where we are hosting. It is usually in a hotel.....we rent a room and provide light food for them. It can usually be in the evening after school has finished or on Saturday...” (P1).

The generation of useful ideas and comments are commonplace during workshop activities, according to PC13’s CEO:

“Yes, it is important from a teacher [boundary agent] to teacher”. Additionally, yes that is very important, and when they (teachers that we employ) say something about products and ideas, I think about it, and when it is very good idea I forward it to Genisys”, (P23).

Given his background as a physics teacher, the CEO of PC10 considers workshops as important for information gathering as well as sales promotion:

“...We do workshops in national math and science teachers’ conferences twice a year. Training around the country, individual schools or groups of teachers Meeting people, teacher, principals and other key people at conferences and trade shows, etc. I do my best to have my ears open and my eyes open. I also follow educational magazines, some Twitter® accounts, international forums and national forums, Facebook accounts, just to see what is going on in this business. Yes, we do workshops around the country....” (P17).

P17 also alludes to the fact that he used social media extensively, and frequently messaged the workshop activities that have been carried out. Frequently, P17 would post social media-specific experiment activities undertaken showing the customers conducting the experiments. P17 has noticed that the customers who attend the workshop are also keen to post their involvement in the workshops.

RQ2: How do knowledge generation and KAM managerial actions contribute to the attainment of competitive advantage through the development of VRIO resources?

RQ2 looks at how knowledge is generated, and key account management (KAM) focused procedures, processes, and actions can contribute to the vital VRIO resources associated with a competitive advantage. Fundamentally underpinning this process is the knowledge transfer and assimilation into the SME. Thus, RQ2 investigates to what extent is the customer focussed managerial agency also a significant factor. Table 0.3 summarises the four tree nodes and the 19 associated daughter nodes.

Table 0-3 – Tree nodes associated with RQ2.

Daughter Node	Tree Node: Knowledge capabilities
18	Knowledge codification within the company
19	Knowledge integration
20	Knowledge sharing
21	Methods of Knowledge generation (external)
22	Methods of Knowledge generation (internal)
23	Prior knowledge
24	Tracking ideas
	Tree Node: Marketing capabilities and market positioning
25	Regular customer contact
26	Strong customer relationships
27	Market positioning & Market segment
28	Market share of distributor
29	Marketing strategy
	Tree Node: Reconfiguring internal resources for customer value
30	Ambidexterity in the firm
31	Speed of implementation
32	Strategy for change management
33	Unique value-added resources
	Tree Node: Seizing on external opportunities Value capture by the firm
34	Entrepreneurial activity of managers & owners
35	Leadership attributes of managers
36	Internal processes to capture value

3 Tree Node: Knowledge capabilities

All of the case-study SMEs alluded to the importance of gathering market knowledge as economically and swiftly as possible. These tree nodes consist of seven supporting daughter nodes on knowledge building capabilities, and through which the firm can create and capture value (Table 0.4).

Table 0-4 – Seizing of external opportunities attribute.

Daughter Node	Tree Node: Knowledge capabilities in SME
18	Knowledge codification within company
19	Knowledge integration
20	Knowledge sharing
21	Methods of Knowledge generation (external)
22	Methods of Knowledge generation (internal)
23	Prior knowledge
24	Tracking ideas

3.1 Daughter node 18: Knowledge codification within the company.

Many scholars regard knowledge gathering and integration as a critical aspect of capability and resource development, which adds value for the customer. External knowledge exists as a potential source for a firm to exercise its absorptive capacity to acquire external knowledge, assimilate it and create new knowledge (Zahra & George, 2002). The boundary agent offers a mediating influence over the transfer of knowledge into the firm. However, the codification of knowledge effectively in the firm depends on the KAM influenced managerial agency. A common factor with all of the distributors, regardless of size, is the importance placed on face-to-face meetings. PC3 (Holland), a larger SME, use a central repository for storage of customer, marketing, and product information. However, the effectiveness of key workers’ meeting is stressed:

“...It is by meetings together, and then we add important information to the database so that others who are in contact with that customer can see what history is there. When it concerns information and knowledge that might be important for opportunities that are then discussed in meetings, we would sometimes call especially. All of us will have an input, so from engineering, programming, financial and marketing to decide what to do. I suppose this is down to the individual manager. A good example is your visit here and the strategy discussions we will have later. All of our team will be there to see first-hand what you are saying...”

The practice is also trusted by PC4 (UK):

“...We have regular meetings where we share what we have got, and we know where we are at. We have found that is far more efficient than anything else we have tried, literally just face to face meetings...” (P5).

The face-to-face meeting allows contributions and opinions from co-workers, and it is a more efficient dissemination method of knowledge codification in the smaller SMEs. PC4 (UK) used meetings to encourage employee engagement:

“...we will identify something, look at how we are going to market it and will write a brief marketing plan and we will do it. It all comes from feedback from everybody. So yes, there is an internal process...” (P4).

PC9 (Belgium) regards the codification of knowledge as a big challenge facing the firm:

“...I cannot think of a specific way that we do that. I think for our company that is a big challenge to us. Yes, we have our server running here in our office where we have specific product support and other stuff on Genisys products and all the stuff what is happening around. We keep it in a place, but we do not really structure it much...” (P16).

The majority of the participant firms were all concerned with how effectively important knowledge gained through boundary spanning or KAM activities are efficiently codified in the firm. This appears to be an important area where potential value capture by the firm is being lost.

3.2 Daughter node 19: Knowledge integration.

Many scholars regard knowledge gathering and integration as a critical aspect of dynamic capability and resource development (cf: Alegre et al., 2013; Villar et al., 2014; Zahra & George, 2002). This tree node is related to the tree node “external scanning.” However, this node focuses specifically on knowledge gathering and the integration of that knowledge into the firm. The integration of knowledge into the company is grouped into three daughter nodes, namely external and internal generation and then the integration of this knowledge. In this section, knowledge gathering externally was discussed and how that knowledge is integrated into the firm. The boundary agent features prominently in ten of the thirteen of the case companies for transferring and codifying knowledge into the firm. PC1 (Ukraine) and PC12 (Croatia) invite them to special meetings to advise on strategic marketing plans:

“...We bring the sales manager and our pedagogical manager together so they can talk directly. The sales manager knows some good teachers we are starting to hire part-time [boundary agents], and they give feedback on what customers think of our products.....also improvements...” (P22).

PC12 recognise the importance of making use of knowledge gained, and in order to crystalise it in the firm, makes a point of employing part-time boundary agents that are good at engaging with their colleague customers. In all of the interviews conducted in this study, the part-time boundary agents were all present.

3.3 Daughter node 20: Knowledge sharing.

The process that underlines the sharing of knowledge is deemed very important, irrespective of the size of the firm. PC2 (Czech Republic) place a high premium on meetings between both of the senior managers:

“...This is extremely easy because we are a small company. There are basically only two people in it, me and Jacob, we work together day by day, so we have plenty of time to discuss things and if we want to teach something to one of our employees who is not a regular employee but is hired for part-time for specific jobs...” (P2).

PC1 (Ukraine), a large firm also acknowledge the importance of frequent meetings as facilitators of knowledge sharing:

“...This [knowledge sharing] is by meetings between different departments. It is usual that we have monthly meetings with everyone together....and then weekly meetings with smaller groups. For example, sales and marketing meet. They share what they need to share and then produce the marketing plan or catalogue..... When it is decided what to do, we have an internal newsletter that is sent by e-mail informing everyone of what is planned and also when it will happen. This is a pretty typical way...”(P1).

The utility of meetings is also emphasised by all the case-study firms, in particular, the larger distributors (Holland, Germany, and Turkey). Since all the case study firms were all SMEs with limited resources compared with larger rivals, regular face to face meetings to share knowledge was the most effective. It is at these meetings that decisions are taken on marketing strategies, product added value and how to ensure that the customers are provided with a personal high-value service. One of the key objectives of the case study firms was to ensure that when a customer is captured through superior value-added service, they are retained for life.

3.4 Daughter node 21: Methods of knowledge generation (external).

The use of boundary agent is given as one of the most important sources of external knowledge in 10 of the distributors. Knowledge may also emanate from their sales forces. All the distributors

confirmed that meeting customers face to face was an effective method of gathering important information and building relationships. The CEO of PC7 (Slovakia) specifically refers to:

“...Workshops, conferences and teachers’ meetings are the best way to gather information. I am a former teacher, so I still know many of the colleagues since I was going to such conferences as a teacher myself...” (P12).

The gathering of external information takes many forms and functions. Important information can be about pricing strategies of competitors, new product releases, or advance notice of future planned tenders. PC7 relies heavily on their “...great network of friendly customers in gymnasiums and universities...” to find out specific information about what their competitors are doing:

“...We can call these people, and someone will know what we are trying to find out. It is usually about pricing reductions or new products that we are interested in most of the time. I can tell my teacher consultants [boundary agents] to call the competitor for a quote or order a product so that I can see it...”(P12).

In a similar vein, PC8 (Turkey) use both their technical sales force to gather market intelligence, but find that there is a limit to what they can achieve:

“...We will ask our salespeople to find out. However, it depends on what that is. If it is a change in how the ministry might be working, we can ask some of the influential teachers we know or talk directly to the ministry. The workshops are great areas to find out what is going on and discussions are relaxed there with teachers and our demonstrators [boundary agents]...”

PC5 (Germany) use their external network of teachers and field salespeople to sequentially gather, codify and assemble external information so a coherent and structured marketing strategy can be developed over time:

“...We have several internal databases, prices, contacts, etc. Databases only for customer relationships and technical data in some databases.....We do research on contacts and learn about the specific topics that are interesting to us. If we find out something interesting to us, we will try and get the contact detail and build a knowledge database. We will then put it into our general database or specifically into the database for us. We will then e-mail them or send a catalogue...” (P6)

Despite Germany being a large market, the firm ensures that it remains a personal one. The distributor uses the market knowledge to carefully craft their newsletters and catalogues to be a hybrid between a useful resource containing using hints on experiments and a regular sales communication. Germany contains several large indigenous science supplies companies, many of which are deeply embedded in the school curricula, so a more creative methodology to communicate with customers in a value-added way is necessary to remain in the market.

3.5 Daughter node 22: Methods of knowledge generation (internal).

Generation of knowledge internally is a matter of using all the resources and capabilities of the SME at its disposal. The gathering and subsequent utility of the tacit knowledge are used to modify or create capabilities that develop into the resources that can become VRIO supporting the creation of value underpinning competitive advantage in the market. PC1 (Ukraine) describe how all knowledge is combined to make their product and customer service more attractive:

“...most effective way is through our regular face to face meetings..... we are more relaxed, and we discuss what has been discovered at....trade shows...alternatively, schools....by customers. We have made a culture to encourage information to be shared and that everyone will get the credit they deserve. So, it is in their own interests, and the company is in the same way. But if we can get our management software working and installed because we are relationship-building focussed...moreover, then build the product for the market...” (P1).

Similarly, PC8 (Turkey) use the knowledge gained from boundary agents to calibrate their marketing message and customer focus:

“...We try to work with the group of teachers we know at the Technical University in Ankara and some of the “Fen Liseleri” schools [private schools] where the standard is high. Here the teachers who are our friends tell us about interesting ways they have used our equipment. So this allows us to put this in our newsletters and the school and teacher also are mentioned...They like this...”(P15).

The importance of regular meetings to operationalise internal knowledge and competencies is emphasised by PC2 (Czech Rep) being a smaller SME:

“...P2 and I [P1] meet all the time. We work very closely together, so we always communicate all day. We discuss everything we hear and work out if we need to do something. In the case of the tenders, we will contact Ministry [of education] immediately and ask them to reconsider the specifications and try and make an argument as to why they make no sense. We will use our teacher colleagues [boundary agents] if we need to. When they get involved, we seem to have a better chance...”

The information from boundary spanning is decoded by P1 and P2, who are, themselves, technically competent salesperson and acted upon immediately if necessary. What this means, in practice, is that the firm can contest a public tender very early in the specifications stage. Challenging tenders under the EU Procurement Law is immeasurably easier before the official release of the tender than after it has been publicly advertised. PC8 (Turkey) also made references to the importance of knowing as early as possible practices adopted by a rival firm to gain a competitive advantage by influencing tender specifications to their advantage. Thus, an example of firms capturing value through valuable knowledge transfer is demonstrated. In specific cases discussed (especially by Czech, Estonia, Slovakia, Turkey and Ukraine), such information becomes an important resource in building competitive advantage. For reasons of confidentiality, the specifics surrounding the *modus operandi* and illegal practices cannot be revealed in this study.

3.6 Daughter node 23: Prior knowledge.

Possessing advanced knowledge of impending tenders or investments in the market is a critical aspect of competitive advantage in any industry (Dyer & Singh, 1998; Tallman et al., 2004). In markets that are tender driven and where corrupt practices are prevalent, prior knowledge and relationships are pivotal as stressed by PC8 (Turkey):

“...when we heard of the move for more than 200 schools in Turkey to switch to the IB curriculum we had to work out quickly what was involved...We saw an opportunity to arrange conferences inviting schools and then giving them the free information on how to teach the science element of the IB. This early advice was given by our part-time teachers [boundary agents], and that has allowed being first in the market [datalogging is mandatory in the IB science curriculum]...”
(P14).

The market intelligence can be freely available to any reasonably competent firm. However, it is the specific knowledge at the level and the Ministry of Education and the personal introductions that prove to be the critical factors. The Turkish distributor talks extensively about the network of influential educators that have been carefully built up over 30 or more years. They have become more friends than professional acquaintances. PC8 acknowledges that this level of relationship complexity is not easily copied by rivals, since the education community in the higher echelons of influence is very small. Hence, a source of competitive advantage that is sustainable over the long term is established. There were similar comments from the Slovakian and Finnish firms.

Prior knowledge of tender specifications is vital if the SME is to compete on an equal footing where there are risks of corruption:

“.... If we know that a tender is coming, we will have an opportunity to be there to be sure that the specifications are written fairly and not be for one of our competitors because of corruption...” (P12, Slovakia)

P12, during the second interview, several months later, discussed (in detail) the challenges he faced when a very large tender was released with specifications that were biased towards a rival firm. However, the specifications were sufficiently broad for P12 to submit a bid. The bid was rejected on the basis of false claims by the rival as the unsuitability of P12’s offering on technical grounds. P12 was able to rely on boundary spanning colleagues, whose reputation was such, that the objections of the rival under the false claims were rejected. It was an important intervention because the tender was about to be awarded to the rival. Since the tender was very large, the supply of the equipment covered more than 75% of all the schools in Slovakia. P12 was awarded the contract in full, so established a market dominance for many years ahead, because customers were now ‘locked-in’ to the platform. If it were not for the relationships built on trust and integrity borne out by P12’s customer-centric focus, a sustainable competitive advantage, against a much larger rival, would not have been achieved.

PC6 (Iceland), who also operate in an industrial market, also stress the importance of prior knowledge, but in a different way, of how their customers’ needs are evolving:

“...This [customer contact] is usually at the individual level. We have just a small number of employees, and each employee tends to be a specialist in their own areas. Our programmers and system engineers would seldom deal direct with the decision-makers in our customers, but they can have contact with customers when they go out to the customer's place to work. Our only salesperson is also an engineer so he can talk technical when he visits customers on training sessions. It is useful when your salesperson is also a technical person...” (P10).

The Icelandic firm has leveraged different resources from different parts of the organisation to try and gain a competitive advantage. Since tendering is now an integral part of doing business there, they need to be able to forward-thinking and innovative. The use of technically competent salespeople is their primary focus, backed up by a value-added KAM strategy. The firm has adapted its value-added offering through remote support platforms and systems they have set up for industrial customers. For example, P10 explained that their industrial division provides sensors to measure a wide range of applications for the Icelandic government – for example, the salinity of seas; temperature and humidity measurements; soil moisture in sports arenas, to name a few. They also collect and store the data over long periods and make this data available free to schools to integrate with their educational products. The reconfiguration of internal resources and organised in such a way that they create a valuable service for the school at no charge to the government. Their only rival in Iceland, exited the market shortly after the interview was collated. P10 is confident that the VRIO

resources created and given free to schools were an example of value creation and capture through customer loyalty and attainment of sustainable competitive advantage.

3.7 Daughter node 24: Tracking ideas.

The larger the SME, the more importance is placed on using the internal and externally sourced information to develop and operationalise ideas. PC5 (Germany) use their technical sales managers to access what information is important and where there are deficits in knowledge:

“...We do have an extensive knowledge of the market. Feedback from sub-distributors and teachers is a benchmark.....if we discover something that we thought we should have known.....or some information has taken us by surprise. It leads to meetings and consultations because we know we are deficient some way. It would be a worry to think that our competitor would have the better market intelligence or better customer relations. That would make us think about what we are doing...”(P6).

The approach is similar in PC3 (Holland):

“.... If there is a planning meeting, we will bring the relevant people to a meeting and discuss our plans for the next quarter. Each person is invited to speak and give an opinion. The best way we get lots of information is through meetings with the salespeople. When they are at our monthly meeting, we [managers] find out more information that we would normally about the market and what is happening....” (P4).

PC1 reflect the importance of developing capabilities at the level of the individual worker and then combining them in a relational way to build essential resources that are customer-focused. PC3 use cross-departmental meetings to collectively codify information brought back through the interactions between technical salespeople and the boundary spanners. A meeting such as these allows management to gather, firsthand, ideas that come through the company that might develop into VRIO resources that can lead to competitive advantage.

PC1 (Ukraine) takes a more inclusive role, actively encouraging co-workers to offer ideas and suggestions:

“.... We ask all employees to be not afraid to offer any ideas they have. We listen to all of them and not reduce them to nothing even if they are not sensible. We have to encourage every time.....we have an open culture that supports this. It is usual that the ideas and suggestions are passed to Valery or me. The outside teachers communicate with Valery [the technical salesperson] more than me. So, when ideas are given, we might ask for more details, and if they are useful we will pass it to the department who would be the most suitable. (P1).

Thus PC1 goes deeper into the organisation to allow anyone who wants to contribute an opportunity to do so. Giving ownership of the idea back to the co-worker who originally proposed the idea is regarded as important in PC1:

“...The person who passed the idea will always be involved in its progress...if we do not do that and they do not know what has happened.... they will not give more ideas...”(P1).

PC1 facilitates the free movement of knowledge and ideas through the whole firm. Workers are incentivised to put forward ideas and rewarded with allowing them to participate in their adoption is thus a rare opportunity in many firms. PC1 has established a strong position in the Ukrainian education market that can be traced back to their readiness to learn and re-configure, if necessary. Thus, resources within the firm are built on relational competence and hard to copy by a rival.

3.8 Tree-Node: Marketing capabilities and market positioning

Allied to the quality and fit for purpose is the marketing and market positioning of the product in each localised market. The questions addressed the specific market segments targeted by each distributor and the relative importance placed on the development of marketing capabilities and the correct market positioning. Also, the market positioning of the product was discussed as this was of critical importance as to the supporting important VRIO resources. The perceived market share enjoyed by each distributor was also discussed as this could provide a benchmark as to their relative success in their local markets and the extent to which the dynamic capabilities underpin and develop market share (Table 0.5).

Table 0-5 - Marketing & market positioning attribute.

Daughter Node	Marketing capabilities and market positioning
25	Regular customer contact
26	Strong customer relationships
27	Market positioning & Market segment
28	Market share of distributor
29	Marketing strategy

3.8.1.1 Daughter node 25: Regular customer contact.

PC5 rely on their network of boundary agents to maintain contact with customers on a face-to-face basis. German teachers are not easy to contact “.... unless you know them...” (PC5), and thus to maintain close contact and to meet new customers, the network is of critical importance:

“... [I] have a good network of teachers that I built up over the years I have been working in this industry. I am a former maths and economics teacher and worked with TI before I joined this

company. I am still involved with the large group of maths and science teachers who are a member of the TI-sponsored “T-cubed” group. This is the most important place where I received my sales leads where they recommend Genisys to other schools...” (P8).

Both PC4 (UK) and PC6 (Iceland) rely more on traditional methods of keeping in regular contact with customers, such as direct mail, newsletters and on-site visits. Both firms share a similar product organisational structure where they operate in an industrial market in addition to the education market. Their reliance on “traditional” marketing and customer contact rather than boundary agents and networking is related to the antecedents in the firms, according to P11:

“.... For industrial market, we would send out regular mailers in the post and e-mailed newsletters. There are also site visits from our salesman or service calls from our engineers. Sometimes the engineers can gain more information from the customer than the salesman. In these cases, the engineer would call the office if it was urgent or wait until they come back and ask for a meeting...” (PC6, Iceland).

The smaller firm tends more towards direct customer contact and emphasises the “partnership in education” between supplier and customer. The unique marketing approach is highlighted by PC7 (Slovakia):

“...Our customers have learned to trust in our company. This is because of the way we communicate with them. That means we talk to them as equals. We do not present our products by emphasising the technical parts of the LabQuest and how much better it is than others, we talk about the pedagogical advantages instead....”(P12).

PC1 (Ukraine) use direct customer contact to reinforce and build new strong relationships by offering added value wherever possible. The use of their own directly employed boundary agents are used to provide the extra added value after the sales of goods have been completed:

“...Most of the people in the company would be in contact in some way with customers. For sure.....the salespeople and our pedagogical team.... but also the engineers who install our computer networks and interactive whiteboards (IWB) make time to talk to the customer and ask if everything is all right and how we can improve for them. It is a culture here that we want to generate. I also visit schools and turn up at workshops....” (P1).

The general theme pervading 12 of the 13 participant firms was the strong customer-centric approach. Again 12 of the 13 regarded customer retentions as the most critical objective. Their rationale was that customer churn can be minimised if the level of service and perceived added value from a customer cannot be matched by competitors. Hence, ten out of the thirteen companies focussed more on retaining profitable customers, rather than competing with rivals on slim margins. Since the

participant firms regarded their products as being of superior quality with superior added value and service, there was no need to seek out only price-conscious customers.

3.9 Daughter node 26: Strong customer relationships.

The importance of healthy customer relationships is emphasised through referrals and advocacy on behalf of the distributor. Boundary agents can also be effective mediators when offering advice to colleagues:

“...It is mostly from referrals from other teachers. A teacher will say that I was at a workshop meeting, and there was a workshop using your equipment, or a school near me uses it, and I went over to see it. I guess some might come from the marketing efforts as well, but I think mostly from referrals...” (PC5, P6).

Where there is a potential for larger contracts, the smaller SME can be at a distinct disadvantage. In markets where corruption is ubiquitous, the relationship with influential customers and boundary agents can mean success or failure in many instances:

“...There is then trust between us and helps to bring us accurate market information because they see us, colleagues, still. When we hear of something that is developing, we will then be able to identify the person who is the project manager for the tender. If the specifications of the equipment have been written to exclude all competitors (including us) we normally know someone who is influential to help change this situation and make the tender fair and open to all. The risk of having unfair tenders do increase as with the size of the contract. That is normal...” (PC7, Slovakia).

PC8 (Turkey) emphasise the importance of building solid customer relationships over many years that is achieved by adding value, support, and trust:

“...We have our sales managers in their areas and the customer like to call them personally and tell them what they want to buy..... they [customers] also send them e-mails sometimes if they cannot get our managers. The sales managers have a good relationship with customers and visit them many times during the year. Then there is the technical help that we give.....customers value this....so we appear to be a valuable part of Genisys in Turkey....not just a mover of boxes. Our own educators [former teachers now working for the firm] build good relationships with customers through the technical help they give over the telephone...” (P13).

3.10 Daughter node 27: Market positioning & market segment.

Without exception, all distributors position the product at the premium and quality market positions. In some cases, the price reflects this position, and in other cases, the pricing strategy is extremely competitive. Since this is not directly relevant to the RBV and VRIO resource building, the findings

are not reported here. The reason being that the price at which the good is supplied to the case-study SMEs are beyond their control. Hence, they all focus on the quality and innovation of the products instead of a cost leadership strategy.

3.11 Daughter node 28: Market share.

All of the distributors find it difficult to accurately measure the market share. PC3 (Holland) being the largest of our distributors, employ a more structured approach rather than the usual best guess from all the other distributors:

“... Of course I am also doing my market research.....for example...I am looking at the financial position of our competitors using D&B...We have to keep a lookout for even companies outside of Holland and watch to see the expansion plans that will affect us here. This is all relevant to our market intelligence.....it is not just our customers we have to know more about.” (P4).

The difficulty in accessing the market share in each territory is summarised by the distributors:

“...Our market share is very difficult to say. It would be very good to know our market share, but it is very, very difficult to say because that is really something we do not know. It would be interesting to see precisely what technology schools are using, what is available, how it is used but that is something we do not know. For the schools who are our customers with us, we keep track very much of how they use it and how excited they are and these results very good always...” (PC9, Belgium)

“...We have no hard data, but my estimation is, and I do not know if A agrees with me, my estimation is that the most important companies are Genisys and Competitor X, and we are 50/50 or 60/40 or something like that. It is not 10/90...” (PC2, Czech Rep)

3.12 Daughter node 29: Marketing strategy.

In the SME, it is important that the marketing message is highly specific and focuses closely on the needs of the customer and the unique selling proposition of the supplier. The newsletter is used to significant effect in the UK, Belgium, Finland, Estonia, Czech Republic, Ukraine, and Slovakia:

“...It is not easy to be sure, but if we hear from a new customer that they read our newsletters after being sent it by one of their colleagues, then it is easy to see how that has worked. Of course, if a teacher calls us after reading the newsletter then that is also easy to track. I do believe it is very effective because we continue to grow our sales and it continues to bring credibility between our customers and us. Why? Because we do not include all advertising, we only include interesting information about interesting experiments and useful hints and tips to experiments for the curriculum

in Slovakia. We will list the component they need to conduct the experiments, but that is only added for convenience and because teachers have asked us to do this...” (PC7, Slovakia).

In a similar approach, PC1 (Ukraine) use the salient features of the product in marketing that are specific to the needs of the customer. In keeping the message clear and unambiguous, they describe their marketing approach:

“...Our marketing plan then must be clear, and it must explain how data logging can be so useful. Then we have to arrange workshops, so teachers can come and see how it works. Then, hopefully..... they will tell other colleagues, and so we build from there. The other owner of this company is also a teacher, and so he has experience of working in a classroom, so he knows how to explain the technology to our customers. Of course, the other customer we have is the regional ministry of education. We must also convince them of our solution and make sure they see the benefit of it for classrooms...” (P1).

All of the participant firms used newsletters as one of the primary tools to stay in contact with the customer. The newsletters were peppered with useful hints on using the equipment, plus interested and innovative experiment to enthuse the students. The quirky experiments added value to the teaching practice and made the teacher ‘look good in front of the class’ (PC3). Additionally, several of the participants made a point of including experiments that are topical for the time of year, for example, springtime, or Halloween. The newsletters were used to resonate with the teachers, to break down barriers and to be more as colleagues than suppliers.

4 Tree Node: Reconfiguring internal resources.

The daughter nodes “Reconfiguring internal resources” tree node is shown in Table 0.6 follows.

Table 0-6 – Reconfiguring resources attributes

Daughter Nodes	Reconfiguring internal resources
30	Ambidexterity in the firm
31	Speed of implementation
32	Strategy for change management
33	Unique VRIO

4.1 Daughter node 30: Ambidexterity in the firm.

All of the interviewees confirmed the need for the firm to be flexible enough to maintain its market share while simultaneously sensing and seizing new opportunities. All of the dealers recognised that they have to be vigilant at all times and be aware of changes in technology and to curriculum designs. However, all distributors reiterated their reliance on the manufacturer to develop new and pertinent technologies, so the case-study firms are free to concentrate on the changes necessary in their capabilities. The ambidexterity of the case-study firms is facilitated through their close partnership with the close relationship between the manufacturer and its distributors.

The need to be able to exploit new markets outside of their traditional industrial market was alluded to by PC6 (Iceland) who “... *have a strong technical base in our [their] company...*” The CEO acknowledges the new organisational resources needed to move from Industrial to Educational markets:

“...I feel confident that we have the ability to transfer that to schools as well. If we can get some of the teachers on board, and the technical support we can back them up with, will be a strong value offering to the teachers of Iceland. It gives us a significant advantage because our main competitor is just a general office supplier that supplies everything and anything...” (P9)

Ambidexterity in SMEs is considered to be an important factor in recognising new opportunities while simultaneously maintaining a competitive edge in their day-to-day businesses. None of the participant firms consciously sought out to plan for new opportunities, with the exception of PC3 (Holland) who was by far the largest of the case-study firms. In fact, the size of the company only just qualified them in the SME category. In the case of PC3, they are open planned and sought new opportunities through company acquisitions, joint ventures and recruitment of highly skilled workers. Ambidexterity in the remaining firms was influenced through opportunism mediated through knowledge gained by bounding spanning activities. Ambidextrous practices were seen as being risk-laden, and often opportunities were not considered if they were too far from their target markets. Whereas PC3 had the financial resources to diversify away from their core markets, the smaller case study firms were able to maintain a competitive advantage in their niche markets.

4.2 Daughter node 31: The speed of implementation.

The ‘agility’ necessary to compete effectively with much larger rivals was evident from all of the respondents. PC12 (Croatia) confirms:

“...We have to react quickly because Croatia is a small market and what we do will be found out by our competitor quickly, so we must implement our innovative ideas and complete them quickly...” (P22)

Feedback from boundary agents can instigate a quick rapid response to swiftly gain a competitive advantage against their rivals. The CEO refers to an incidence at a workshop where:

“...some teachers at a workshop told us that they required some quick and easy experiments in the Croatian language. So, we asked one of our teachers [boundary agents] to design them with help from Genisys for screenshots, etc. Also, we translated some of the training videos from the Genisys website with our own language subtitles.....this proved to be a key factor in sales increase...” (P19).

While ambidextrous practices in larger organisations are regarded in the literature as being a key determinant in attaining competitive advantage (Jurksiene, Pundziene, Svensson, & Pehrsson, 2016; Kowalczyk & Buxmann, 2015; Kumar, 2012; O’Reilly & Tushman, 2008), the findings of this study suggest that is not necessarily the cases in SMEs. However, speed and agility, when necessary, can make a significant difference, as commented on by P19 from Croatia. There is no doubt that the Croatian firm continued to build more innovations from the initial one to maintain an edge in value-added customer focus.

During interviews with other case study firms, there were numerous examples of small stepped innovative changes made to the products and customer service. All of the case study firms acknowledged that valuable information was shared at international dealers’ meetings, so value-added activities that had been successful in some markets were transposed to other markets. For example, the UK offered free live training webinars to all teachers, whether customers or not, that was then implemented in other markets. Other measures included marketing promotions that included free sensors, exchange of competitors’ equipment as a trade-in against the Genisys brand, and the creation and delivery of a free quarterly science magazine to all customers and non-customers. The foregoing are all examples of value-added activities that were operationalised rapidly after managers returned to the firms after international meetings.

4.3 Daughter node 32: Strategy for change management.

The need for agility and culture for change is also emphasised by PC3 (Holland):

“...We have a culture of change here.....we take everything we are told seriously by our sales people. It was one of them who told us about the current possibility in Germany...so we acted upon it with any delay....and here we are...I do think we are very agile for our size ...it is probably due to our culture and small layers of management (P4).

All of the respondents reference the requirement to change quickly. PC8 (Turkey) sums up their approach well:

“...It is usually me or P14 [company director] who will be in contact with our teacher [boundary agent] and will bring this information quickly to a meeting. We discuss what information we have been given, then make contact with some expert or contact that we will have in the ministry or whatever..... The important feedbacks we get really influences what we do and how to support teachers in schools. It is up to the individual managers to make use of the information we get to design our new products or to modify what we do for our customers...” (P15).

Change management is not only confined to management and leadership, but to the necessary tweaking of practical value-added activities that contribute to the attainment of competitive advantage. In comparison, all of the participants recognised that the managerial structure and culture must have congruity with the resources and capabilities required for change. Particularly, in the case of PC3 (Holland), PC8 (Turkey), PC12 (Croatia) and PC1 (Ukraine), the managers emphasised that the minimalist managerial structure was such that decisions are made quickly to support innovative change and firm agility.

4.4 Daughter node 33: VRIO processes.

SMEs who have to compete with much larger rivals need processes that are unique and offer added value to their selling proposition in a cost-effective way. All of the respondents emphasised their own unique selling propositions which have evolved to suit their local markets. The CEO of PC4 (UK) is aware of the importance of having a USP; ours is that it *“... gives a unique product attribute which is not a product benefit.... but a value-added benefit...” (P5).*

Added value is seen by P18 (Poland) as being pivotal and a key signature process by providing free training on the equipment even before purchase:

“...I also offer training even at the beginning [before they buy] to convince them that they will not be by themselves after buying the product, so they know that the training is possible.” (P18).

All respondents except for Iceland and UK use workshops as an important element of their product promotion. Czech offers a free sensor to schools that attend the workshops, creating a higher value in the mind of the customer. PC7 (Slovakia) uses a pedagogical-based approach to the promotion of data logging that has thrived over many years and built a higher level of trust:

“...Our customers have learned to trust in our company. This is because of the way we communicate with them. That means we talk to them as equals.....we talk about the pedagogical advantages instead. This is the first step in making the sales to the school. You need to convince them that the product is useful and that is not as difficult to use as they imagine...” (P12).

All the respondents were implicit in their belief that a strong customer focus and only putting their most technically salespersons when selling technical products in direct contact with customers was critically important. As P18(Poland) put it: "... there is little point in building resources and capabilities over many years if you then sent out a "...bałwański..." [idiot] to meet the teachers.." As has been discussed in the previous discussions, development of VRIO resources is hugely relational and depends much more than slick company practices. What is essential is that the VRIO processes are carried through and are consistent right up to the customer interface with the teacher.

The foregoing discussions have highlighted the importance of workshops in gathering information mediated using boundary-spanning activities. Again, all of the firms were careful to select their technically competent salespeople to attend the workshops. This is because, on occasion, the boundary agent may run into a technical issue and required the assistance of the firm's salesperson to assist and allow the workshop to continue. All of the case study firms were aware of the fact that their firm had to appear as they were as knowledgeable as the boundary agent.

5 Tree-Node: Seizing on external opportunities.

This tree node builds around the ability of the firm to sense and then seize opportunities quickly, and proficiently as a key dynamic capability, according to Teece (2000). The ability to take the opportunity is equally important regardless of the firm's size. The literature on dynamic capabilities is an adjunct to the RBV Theory that informs and guides this study. The seizing of opportunity required that specific VRIO resources and capabilities are deployed in the most agile manner possible. This involves certain novelties that are intrinsic to the causal ambiguity that is difficult for rivals to disaggregate and hence imitate. Due to the highly confidential nature of some of the specific processes put in place by the case-study firms, requests of utmost confidentiality have been respected, and the following discussion in this daughter node will proceed through a generalised summary.

Table 0-7 – Seizing of external opportunities attribute.

Daughter Node	Seizing on external opportunities
34	Entrepreneurial activity of managers & owners
35	Leadership attributes of managers
36	Internal processes to seize opportunities

5.1 Daughter node 34: Entrepreneurial activity of managers & owners.

While static routines (such as operational routines) are extremely useful in the firm and can be a source of sustainable competitive advantage, for a while at least, it is the dynamic capabilities that

underpin the competitive advantages at the enterprise and entrepreneurial levels (Teece, 2009). Dynamic capability theory is concerned with markets that are in a state of ‘high-velocity’ change. The dynamic capability is deficient in what it means by a “high-velocity” change and when does a “high-velocity” change stop and revert to a ‘normal’ level of growth. Additionally, markets can move from a normal change level to a high-velocity level and then back again to some state in-between. Although a discussion involving the dynamic capability paradigm is necessary, it is grounded through the lens of the RBV.

Thus, reflecting the consensus in the literature, the entrepreneurial, managerial agency from both perspectives (that is, DC and RBV theories) is confirmed by PC12’s (Croatia) view on the importance of inspired entrepreneurial change:

“...For daily activities, yes we are encouraged to be our own businesspeople [entrepreneurial] as much as we can. I get more confidence as time goes by..... it is good to have an open relationship with P19 [CEO]....we work together well...”

The importance of promptly seizing an opportunity was described by P3 (GM) of PC3 (Holland), which has led to a significant strategic opportunity:

“.... Our decision to take over the market in Holland was from an informal discussion in a bar after the distributors meeting in Cambridge..... It was clear that a key man was unhappy with the recent takeover.....so we seized on that possibility.....and now we will shortly become the distributor in the Netherlands as well as Germany.... but of course...we had to move swiftly to achieve this situation.so, we have a much bigger opportunity in our lap...once more we embraced this possibility, and it will be very good for us...suddenly we have a new market presence in all of the science supplies markets...”

The researcher was party to the discussion in the bar, as described above. The ability of PC3 (Holland) to swiftly act upon an opportunity was made possible by their prior network of boundary agents who were in contact with the key man before the sale of the business. PC3 were therefore in possession of critical knowledge that allowed them to prepare VRIO resources for a possible entry into the market. PC3 already had in place a sales force that was comprised entirely of retired headteachers (in various subject disciplines), and scarce resource not possessed by any other competitor in Holland. The knowledge and connections allowed PC3 to rapidly access the likelihood of a successful takeover of the smaller rival. Since acquisitions were not new to PC3, they had expertise in finance, management and operations, to ensure that a quick and successful takeover with a high probability of success. Building on the organisational resources already in place, and the rarity and inimitability of its sales and support infrastructure, the firm was able to rapidly develop value-laden activities to the customer base to ensure it remained loyal after the transition. With the financial

resources and the cumulative managerial experience, PC3 was able to wait for a return on their investment through values captured back from the customer.

In Turkey (PC8), who are also manufacturers of traditional physics teaching equipment, decided to integrate the data-loggers into their own range. The result of that is described by the CEO:

“... We decided that the data logging technology could solve many problems of accurate data collection on some of our own equipment.....it was an instant success, and we now integrate many more of our apparatus...”

PC8 is unique amongst the case-study firms in that they are also manufacturers of more traditional physics teaching equipment. The CEO of PC8 (Turkey) released that by integrating the data-logging technologies, the firm could substantially increase its market scale and scope. Thus, in one example of seizing an opportunity, the firm was able to commence with the creation of a new set of VRIO resources and capabilities that would allow them to gain a competitive advantage through a seamless configuration of the old and new technologies offering a hitherto products not available before. Since many teachers struggle with integrating new technologies into their teaching of experiments, PC8 delivered the solution in a single product. PC8's CEO admitted that if it had not been for input from boundary agents and prior VRIO resources, the idea of combining both sets of equipment would not have happened.

5.2 Daughter node 35: Leadership attributes of managers.

The importance of competent managers is emphasised by Ambrosini & Bowman (2009) for showing leadership in the reconfiguration of processes necessary by leverage existing resources. The importance of competence is reiterated by PC8 (Turkey):

“...Without the specific product managers and sales managers, any new ideas cannot get put into action. These are important positions for our company because we generally employ people here that are at least graduates in some science subject. It is better if they have been a science teacher themselves because they can understand better what feedback comes from the customers...” (P14).

Not only does the competent leader build last relationships with boundary agents, but are able to make sensible and rational decisions when presented with market knowledge:

“... here is also a good relationship that develops between managers and outside teachers [boundary agents] and they can talk freely and not be concerned that they are really talking about a company. The role of the manager is important because they have the authority to make things happen with what they are told. The manager is important because they can decide if the information is important or not to take some actions...” (CEO, PC8).

The CEO of PC4 (UK) advocated relational competence building, where staff members share tasks to gain a better understanding of how the firm operates:

“...We seem to share and help out really. There are roles and responsibilities for each person, but the lines seem to be pushed a little bit because of we all muck in and share what we need...”

5.3 Daughter node 36: Internal processes to seize opportunities.

All distributors report that an internal meeting is the most effective and efficient method to discuss potential opportunities and formulate plans to seize them. The smaller SMEs depend on their agility and flexibility in reconfiguring resources and their strong customer relationships. The CEO of PC9 (Belgium) reiterates:

“...Our Company is very much like an all-in-one printer; we are a small group we can have formal discussions and small meetings to point out new developments in the market....”

The larger distributor employs a more structured approach. In a similar vein, they accord the need to be agile and flexible as the most decisive factors is seizing opportunities. The technical and entrepreneurial competencies of the key managers are also emphasised as pivotal. Where public procurement contracts are susceptible to corruption, the SME relies heavily on their boundary agent contacts to help open channels of discussion to ensure that the tender process is transparent and fair:

“...We always try through official channels first. You have to be careful because you cannot interfere with the tender process because you..... could get disqualified. This is where a close relationship is so important..... with ministry officials. Our competitor has that relationship, and we are jealous because we do not. Our competitor is also jealous of us because of our relationship with teachers [customers]...” (CEO, PC2).

RQ3: Where is the value created and captured by the firm?

RQ3 presents the findings from the final group of daughter nodes whose common theme was the delineation of the SME's VRIO resources and (where applicable) dynamic capabilities that were perceived as being that which contribute towards the building of VRIO resources and capabilities necessary for competitive advantage.

6 Tree-Node: The firm's VRIO resources

This Tree-node table exemplifies the sources of the creation of the VRIO resources. As would be expected, the methods through which KM and KAM source and disseminate the knowledge to build VRIO resources is part of a highly relational system (Table 0.8).

Table 0-8- Foundations of VRIO attributes.

Daughter Nodes	Tree Node: The firm's VRIO resources
33	Business model selection
34	Strategic VRIO configurations
35	Managerial Agency
36	Networking skills
37	Relationship with supplier
38	Adding value for the customer
39	Antecedents
40	Division of responsibility within firm
41	Educational background of workers

6.1 Daughter node 37: Business model selection.

The findings show that the case-study companies' primary focus is on the customers, and to a lesser extent on their competitors. The approach to the market by the different distributors shares remarkable similarities. PC7 offers a unique perspective since the CEO was also the owner of a larger SME and now owns a smaller enterprise:

"...I ...used to have a larger company with nearly 100 employees... When business was down, I would not pay myself.... So, it was a hard time...When we are small, we can be very light on our feet and make changes very quickly if there is a need. We are always easy to contact for our customers who get a relationship with us. It is nicer being a smaller company..." (P12).

In Turkey and all countries (except Germany), the model is to supply direct to schools only. Direct contact with customers is regarded as pivotal in recognising the microfoundations necessary for dynamism (P9):

PC8 (Turkey): We had five salespeople who covered all of Turkey for us, and they still work for us. They live in the major cities outside of Ankara to be close to the local ministries, the schools and universities. We have 48 persons working in PC8 and we occupy three separate locations in Ankara (P13).

In Germany, due to its large territorial size, the business model operates both directly and through sub-distributors:

“...We have a two-model approach in Germany. One is to try and sell more and more directly to schools, and the other is through sub-distributors. I visit our sub-distributors on a regular basis to see for myself what is going on and discuss any issues. Because these distributors sell to the schools, I am removed from the customer, and that is difficult. So, our plan is to sell more and more directly....” (P8).

The case study firms chose the business model that was most appropriate to their needs. In all but Germany, the firms had a direct relationship with the schools and teachers. Thus, their approach was a direct relationship with the end-user. Reflecting the more traditional approach of business in Germany, the dealer adopted a model that is based on selling through specialist re-sellers. The re-sellers then developed the relationship with the schools and teachers. The rationale was that Germany was too big geographically and in economic terms that regionally located re-sellers (or sub-dealers) reflect the most efficient route to market. Germany, being a Federal State, operates different curricula in each of the Federal regions. Therefore, it is impossible for a centrally located SME to adequately engage with each different Federal State. In order to develop the resources and capabilities to enjoy a competitive advantage, the VRIO resources necessary to support, market, localise and offer training is resident in the case-study firm (the dealer for Germany). The necessary VRIO resources are then developed individually by each of the sub-dealers to address the specific needs of the different Federal States. Therefore, unexpectedly, the VRIO resources are shared and combined between dealer and sub-dealer to ensure that a valued-added customer focus is maintained. The model has confirmed that the brand of equipment is securely embedded with the curriculum of each of the Federal States, so that transference to another supplier’s brand is all but impossible, while that particular curriculum remains in place. In short, the firm enjoys a competitive advantage with the return of value from the customer in the form of superior profits and assurance of continued sales in the immediate future.

6.2 Daughter node 38: Strategic VRIO resource configurations

For smaller SMEs to effectively compete with their much larger rivals, the findings show that they need to possess VRIO resources (and possibly, unique dynamic capabilities) that are not easily imitated by competitors. The relationship is key, according to PC8’s (Turkey) P14: *“...The relationship with our customers is always first in our minds. If we act correctly through support and delivering good products, we bond with them, and they help us to keep delivering the correct service that keeps us ahead of our competitors...”*

PC3 (Holland) also emphasise relationship building, value-adding and competency development between employees:

“...They really understand the technical aspects of the products and can be confident in dealing with science teachers. I am not sure if they are former teachers or not, but they are technical... It is really knowledge...knowledge of our customers...knowledge of our products...knowledge of the curriculum We can add a big value if we can support them with salespeople who were former teacher themselves for, they can give the right advice...which is valuable... We prefer people who are in direct contact with teachers to have been teachers themselves first. Even in senior positions and who have retired from teaching. We find these people effective... We are good at building relationships with customers and developing services and products with the help of our customers.....we have a wide skill base of well qualified and highly experienced people...” (P3).

PC9 (Belgium) regard a rapid technical response to any customer related problems as of pivotal importance:

“...I think because sometimes when teachers ask questions specific about analysis, it is important for them to have someone who has an answer the question and not ignore the question and talk about other things...” (P16).

Leveraging their network of contacts is emphasised by PC2 (Czech Rep):

“...Yes, I think it helps us that we sit on the Department of Physics Education Board, and I think Competitor A is jealous of this. What is very important is if some teacher is to buy our equipment...and they have a problem they know the person will ask for help, and now after a few years we develop our market it is also important that there be a really big community of teachers and schools who use our equipment so it is really easy for us to send an email to almost every city in the country and I can tell them that next to you is two schools who have this - you can go there and try it, talk to these people and this really works...” (P2).

A common goal, although not achieved by all participants, was a strategy that embedded their products into the local curriculum. What that means is that, if the science curriculum is devised such that the procedures are similar to the methods used to gather data by a particular product, then that is the only method many teachers are likely to follow. The reasons are three-fold: (i) purely for reasons of convenience, (ii) the final State examinations will likely use questions based on that method, and (iii) the textbook publishers will only use the same methods.

Of the case-study companies, 12 singled out the need to be embedded in the curriculum standards. Once that has been achieved, the textbook publishers will only write their materials around the methods adopted by that particular manufacturer. Since textbooks are ubiquitous with teachers and students, the scale and scope of the reach are greatly magnified. Moreover, it is not uncommon for the publishers to request images of the products showing them in operation to be used extensively

throughout the textbook. The textbook publishers commission teachers to write the materials for them. As the Slovakian and Czech dealers pointed out earlier, these teachers are prime targets to be employed as boundary agents because of their networks and influence.

6.3 Daughter node 39: Managerial agency.

Managers (or key individuals) represent a primary source of advantage if they offer superior skills that do not present in competing firms. The literature recognises that it is these skills and resources that confer the ability of the firm to outperform its competitors (Day, 1994). The findings show that the role of managers is considered critical in seizing opportunities quickly.

PC3 (Holland): "...We have sales, marketing, technical support, product development, shipping and accounts. The responsibility of management is to coordinate all of the roles and help with the direction and strategy of what we can do as a company. The salespeople work closely with the sales manager and the general manager. This is always a busy group because they are always coming with suggestions from customers, or trade shows and competitors. The role of management is to try and gather this information and use it properly..." (P4).

6.4 Daughter node 40: Networking skills.

The power of networking with former colleagues and associates in the Ministry of Education is evident in Slovakia, where a successful challenge resulted in a large contract being awarded to PC7:

"...They [networked contacts] have been vital in helping me understand what I needed to do, and also being able to understand the arguments I was proposing. The relationship I have built up over the years, teacher to teacher [referring to himself as a teacher] has been an important reason for this success. When physics professor declares she supported Genisys after the presentation I was thrilled because I have felt that we had engaged on a professional level – former educator and me as well. The competitor company only sent a salesperson, who knew the technical aspects of the product but nothing pedagogically. This was an important advantage for me..." (P12).

For PC2 (Czech Rep) the benefit of networking in their own University results in establishing a pool of highly qualified specialists:

"...most of the people are physics teachers, but we try to find also colleagues from other branches, for example in Charles' University so we have specialists for this, and we train specialists for this..." (P3)

The CEO of PC4 (UK) held the position of Chairman of the Science Suppliers Committee of the British Educational Suppliers Association (BESA) for three years. The knowledge, networking and insight gained in the science market changed his attitude towards the industry:

“...When I first took over as Chairman, I was full of enthusiasm to change perceptions of science learning at Government level. I attended the House of Commons and presented at select committees on numerous occasions...The general mood of the BERA members was downbeat and anxious.... they all reported tough market conditions and a gradual slide in sales and profitability. From this involvement, I make some alliances with suppliers who were not competitive to us, but were complementary to our own products....it has helped establish an even bigger network, and we see the benefits slowing maturing...” (P5).

6.5 Daughter node 41: Relationship with the supplier.

Relationship with the supplier is shown to be of central importance to have a sense of security and to be prepared to invest in the brand locally. All of the distributors alluded to this important relationship feeling part of a global “family”. The desire for a continued and closer relationship was evident in the interview findings, for example, the CEO of PC6 (Iceland):

“...We are grateful for your help and the relationship we have with you. We know that that will be a big factor in our success...” (P9).

Similarly, in the early days of their association with Genisys, PC2 (Czech) were grateful for the advice given to them:

“...it is good for us if we know things in advance with plenty of pictures in good quality. Sometimes sharing your experiences would be good for us for example, if we were thinking of giving [sensors] for free you advised us not to do this because it doesn't work simply and we now agree with you, so this is good, and the great thing is if we have some marketing idea like borrowing or lending [sensors] to schools you assist us to give it with some price reduction, this is very good...” (P3).

6.6 Tree Node: Absorptive capacity & competitive advantage factors

This section will examine the findings from the tree node of absorptive capacity & competitive advantage factors (Table 5.32 below). The previous discussion has discussed the utility for strategic alliances (supplier, boundary agents, and commercial partners) to develop absorptive knowledge capabilities. The inter-connections of factors of competitive advantage perceived by the case study respondents will now be discussed (Table 0.9).

Table 0-9 – Competitive advantage factors tree node.

Daughter Node	Absorptive capacity & competitive advantage factors
46	Assistance from Genisys
47	Feedback from the distributor to Genisys
48	Innovative products suitable for the local market
49	Local office support
50	Perceived Factors necessary for Competitive Advantage
51	Quality and “fit for purpose” of products
52	Tacit skills sets within the firm

6.7 Daughter node 42: Assistance from manufacturer.

All distributors cited assistance in terms of marketing materials, technical support, prompt deliveries and advance notice of new product developments as being the key issues in the development of their absorptive capabilities. A closer working relationship between supplier and distributor is emphasised by PC1 (Ukraine) as it helped to understand better what the local market was telling them:

“...If I could say something that would improveto tell us earlier about new product releases. Now we do not get too much notice, and so it is a panic to produce advertising materials. This should be improved to be better...” (P1).

The CEO of PC11 (Poland) stresses the need for closer marketing and operational ties to compensate for knowledge deficiencies in his organisation:

“... it would be good to have more help with how to promote the products better. This is not my area.....I am more of an engineer....yes.....it would be excellent to work more closely (P18).

6.8 Daughter node 43: Feedback from the distributor to manufacturer.

Regular dialogue and communication with the manufacturer are stressed by all case-SMEs. In particular, PC13 (Estonia) regular feedback received from boundary agents about new product ideas and modifications to existing products. The CEO criticised the supplier for not taking suggestions more seriously for localisation and not assisting more in developing a joint marketing approach. The CEO of PC12 (Croatia) however, espouses the close relationship with the supplier and shared experiences can help with his firm’s absorptive capabilities:

“.... This also builds our strength because it shows that a big company is also our close partner. We are really delighted when Genisys sends someone who has been a teacher before because they can share experiences in other countries. This is really important...” (P23).

6.9 Daughter node 44: Innovative products suitable for local market.

Innovation and the first to make new unique products are cited amongst the strongest factors for competitive advantage. The GM of PC3 (Holland) explains why innovation is important:

“...It is always useful. If you have something that is innovative or new, the salespeople love to go to customers and show them these new cool products. It is like refreshing the salespeople. It is also good for the company because it gives us a head start on the competitorsthe new sensors.... allow us to take advantage of the iPADS and Android tablets in schools and start to generate a new market even though the school may already have a competitor's products. Yes, it is important...” (P4).

6.10 Daughter node 45: Local office support.

The support of a competent local office is regarded as a key area to absorptive capabilities, which lead to the development of important dynamic capabilities for success. The security for the customer is that there is a local language specialist to assist in matters of technical and quality issues. After-sales service and training are a necessity to establish a good reputation with customers:

“...Yes [training] is definitely added value. The fact that we offer training support with it as well which is far better training support than anybody else out there, I think that really helps as well...that is the feedback that we get back. They are looking for a solution that is going to work every time, and they get backup from people who know what they are talking about...” (CEO, PC4)

A view that is shared by PC13 (Estonia):

“...Yes, training is very important. So, it is OK teachers will get the device but what will happen after more from this device and I think training is very important, and we offer it when we make an offer to a school. If it is a new school for us, then I offer always training, so I will go and do onsite training...” (P23).

In addition, the advantage of local office support also extends to the localisation of pedagogical material, and all distributors as important sources of competitive advantage see the translation of software.

6.11 Daughter node 46: Factors necessary for competitive advantage.

This was an area of rich discussion with all distributors expressing specific factors for their regions. All respondents acknowledged that the firm must have highly developed knowledge absorptive capabilities. Without these capabilities (that must, in the main, be VRIO), a competitive advantage against larger rivals becomes a difficult task. The factors deemed necessary for competitive

advantage are arranged in two groups in Table 5.33 (below). The first group describes the factors common to all case companies, while the second group refers to specific factors for each region. The discussion contained references to product quality and fit for purpose, which is outside of the focus of this research but is worthy of a mention.

Eight of the case-SMEs referred to the need to develop absorptive knowledge capabilities that were difficult to imitate by rivals. Examples are given included holding specialised webinars, specialised workshops and partnerships in EU projects and with textbook publishers. The CEO (P14) of PC2 (Czech) cites their ability to produce and demonstrate novelty experiments as a means to generate feedback from customers regarded as being a particular VRIO absorptive capability:

“...we try to go to all the important conferences for teachers, we are there as teachers, so we always try to have some papers and to try and talk about experiments - not just 'buy Genisys', but 'hey guys here is a good experiment for you, you can use Genisys'”(P2).

Table 5.14 acts as a concise summary of the discussion of the preceding nodes 42-46. As the summary table in 5.14 shows, the factors considered necessary that confer a position of competitive advantage are many and varied. The general factors are outlined, in no particular order, as they were all considered to be critical to one degree or another. The VRIO factors are then representative of some collection of various individual factors. The VRIO factors listed in Table 5.14 are not individual and distinct, and general aggregate factors to become VRIO resources. Hence, the general factors on their own are unstable and not sufficient (in most instances) to allow competitive advantage to occur.

Table 5.14 summarises the important value-added activities carried out by the case-study firms. The individual factor varies from ensuring that the products are of a high enough quality, and they perform the tasks necessary to the local curriculum needs. This is further reinforced by the local supplier's efforts to make sure that the front-end software is translated into the local language, and moreover, that the technical terminology is accurate. Such an important factor of translation ensured that there is consistency between the curriculum textbooks and the data logger device. The firms all worked hard at building a solid reputation based not only on product localisations but on customer-centric engagement and support wherever it was needed. The combination of these factors appears to the customer that an imported product to be a local product. Only firms that can entirely focus their efforts on a niche market can create a VRIO resource that is hard to imitate.

Encouraging customers to form groups geographically dispersed around the country helped the firm also establish a broad group of boundary spanners. The effect is to create an extension of the firm's technical sales and support staff, providing a resource that is rare compared to the larger rivals.

Strategic alignments with complimentary suppliers, such as textbook publishers, is one of the several instances where sustained competitive advantage can be achieved. In aligning with publishers and supporting their written materials, the brand becomes associated through illustrations in the textbooks of experiments being conducted with a particular brand. Teachers, therefore, consider the brand as the one that is recommended by the government and hence purchase it over other alternatives.

The associated VRIO factors that are developed, such as the building of relational competencies and capabilities, originate quite often in the form of important knowledge gained through boundary-spanning. The developed KM and KAM skills of the firm, create the resources that particularly valued by the customer. However, this is an iterative process and one that is not always perfected immediately. As Table 0.10 the generation and/or reconfiguration of VRIO resources are dependent on many factors that are all highly relational.

Table 0-10 – Factors of competitive advantage

	Individual Factors.	VRIO Factors.
INDIVIDUAL FACTORS COMMON IN CASE STUDY FORMS	Quality products (fit for purpose).	
	Boundary spanning activities.	
	Excellent customer support and training.	
	Firm reputation.	• Boundary agent and spanning activities.
	Localisation of pedagogical materials.	• Antecedent factors which include firm reputation and signature processes.
	Localisation of products.	• The localisation of products and curriculum adoption.
	Embedding in local curriculum.	• Customer-focused philosophy and credible technical sales staff.
	Frequent newsletters with helpful information.	• Relational competence building and inclusion.
	Strategic partnerships (e.g., Textbook Publishers).	• Managerial agency in facilitating change rapidly.
	High-quality education support materials.	• Integration of KM capabilities with a dynamic KAM approach.
	Innovative products.	• Regular and close contact with the customer through practitioner-focused workshops and newsletters laden with useful teaching hints and tips.
	Local office and technical support.	• Strategic alliances with textbook publishers.
	Exclusivity of the commercial relationship with the supplier.	
	The relationship between supplier and distributor built on trust.	
	Knowledge exchanges with fellow dealers.	
	Networking – locally and internationally.	
	Flexibility and ease of use of technology.	
	Knowledge codification and knowledge sharing	
Competitive pricing.		
USD currency fluctuations.		

Absorptive capabilities confer on the firm the ability to listen to what the customers are telling them; good or bad. The CEO of PC4 (UK) stressed the importance of the firm's reputation to listen and hence to give the customer what they need in that cost is not the determinant in the decision to purchase data-logging, but more to the quality and reputation of the firm:

".... up to date equipment with the knowledge base to back it up effectively is what we need. Schools who invest in hi-tech computers have to make sure that we are at the forefront of that.....Price is not as important as people think it is. People will pay a little bit more. Its value they are looking for and confidence that what they are buying they can use, and they get the backup to help them use it..." (P5).

6.12 Daughter node 47: Skillset within the firm.

This daughter node relates to the "local office support" node. All the case companies agree that technical competence and marketing knowledge capabilities are necessary antecedents gathered through absorptive capabilities. All the case-companies regarded a high level and quality of customer care and contact as being of pivotal importance because of the technical nature of the product.

PC2 (Czech Rep) recognise the importance of local, high-quality technical support which is reflected in their unusually high level of sales:

"...I think what is very important is our technical support and not only our but also the support from Genisys in the US or Ireland cause if some teacher asks something to me so I give the answer immediately, and it is great for them..." (P2)

The advantages of being a former physics teacher help with the development of absorptive capabilities honed through many years of relationship-building is recognised by the CEO of PC10 (Finland):

"...I have teachers from middle schools so that I can discuss with them things about the market and things like that. They are not in the company, but I use them for workshops...the benefit of my background is clear in sales communication with teachers. I have the first-hand experience of many products and can tell how they can be used most efficiently in classroom..."

In summary, the key skill attributes for the development of absorptive capabilities in the case companies are technical knowledge capability; managerial competencies; marketing knowledge capabilities; experience of teaching; and, use of boundary agents.

7 Tree node: Foundations of Competitive Advantage

This tree node examines differences and similarities between each of the case companies in the creation of the foundations of competitive advantage through resources and capabilities considered to satisfy the conditions of VRIO in the case-study firms were not exclusive to one particular area within the business but pervade many different areas building on capabilities elsewhere and were influential in the development of competitive advantage. Accordingly, the division of responsibilities within the firm provided unique insights into the mechanism whereby the small firm must build and reconfigure its VRIO resources and capabilities (Table 0.11).

Table 0-11- Foundations of Competitive Advantage

Daughter Node	Foundations of Competitive Advantage
48	Adding value for the customer
49	Antecedents
50	Asset and resource orchestration
51	Division of responsibility in the firm
52	Educational background of the workers
53	Interrelationships between workers
54	Path dependency
55	Strategic alliances

7.1 Daughter node 48: Adding value for the customer.

All of the case firms recognised the need for added value as a key success factor in their ability to exploit opportunities. The central theme was clearly established that added value must be seen by the customer as such. P4 of PC3 (Holland) suggests that internal knowledge and technical capabilities underpin their value-added proposition for the customer:

“...It is really knowledge.... knowledge of our customers...knowledge of our products...knowledge of the curriculum We are able to add a big value if we can support them with sales people who were former teacher themselves for they can give the right advice...which is valuable...”

Value-added services also extend to offer advice and knowledge concerning forthcoming curriculum changes:

“...STEM is starting to become popular in Holland [PC3] ...but our customers are not really sure what is all about...there is no guidance from the government. As a major supplier in Holland...we see it as our duty to help fill in this gap...” (P4).

The Dutch dealer recognised that teachers were being asked to teach STEM subjects without any curriculum to guide them or any training from the government. Understandably, a stressful situation for teachers, and one that PC3 was able to fully understand and empathise with given that its entire salesforce is composed of former headteachers. PC3, although was an established supplier of educational equipment in Holland – mostly kindergarten – the opportunity to provide a free textbook to help and guide stressed customers (and potential teachers) quickly propelled them towards a strong position in the market. PC3 admitted that it was with the help of boundary agents that this rapid response was possible.

PC6 (Iceland) also view competent technical support as being of significant added value. P9, the CEO believed that a holistic approach to sales in a small market such as Iceland is vital. The technical competence of the firm allows them to offer and solve technical problems that are not directly related to the specific products they are selling. A particular example given was where the data-logging software required was installed on the school’s computer server, a technical task that is not straightforward given the complications in assigning IP addresses to each data logging device:

“...It is very important. You have to give the service that is required...the customer needs technical help; then you must give it... This is the case in our industrial division where all the products are technical... It gives us a significant advantage because our main competitor is just a general office supplier that supplies everything and anything. Therefore, they have no technical ability, so if a school researches themselves a product they carry, that is the only way that sale will be made...” (P9).

Customer service is recognised by PC7 (Slovakia) as a significant added value by the customer when competitors do not offer an equal level of value. The CEO was forceful in his belief that adequate, value-added support in the form of training for the life of the product has to be made available. The simple maxim is that customers must be confident in using the equipment because it will be used, and other potential customers will see that and be inspired.

“...The competitors are mostly focused on just winning large orders through tenders and do not care about the teacher who has to use the equipment. We are different because we start with the teacher and visit schools as often as we can to do training and make sure they are happy with the equipment.... The best advert for our equipment is to see it be used on a day to day basis by teachers who are not yet customers...” (P7).

The attention to customer needs and support has led to a strong bond:

“...Our customers have learned to trust in our company. This is because of the way we communicate with them. That means we talk to them as equals. We do not present our products by emphasising the technical parts of the LabQuest and how much better it is than others, we talk about the pedagogical advantages instead. This is the first step in making the sales to the school...” (PC7)

PC1 (Ukraine) were quick to recognise that their home market was not the most sophisticated in terms of technology in school, so it needed a specific approach. This involved making a copy of the supplier’s website, thus giving the initial impression that the products are established in Ukraine. The manufacturer based in the USA is synonymous with an unrivalled level of teacher support; therefore, it was necessary for the local dealer to mimic the same in Ukraine. It was a level of service never before experienced in the education industry.

“...The value added is put on the product in the form of support [technical and pedagogical] to the teacher. We have tried to make a copy of the Genisys website in Ukrainian, where we have put all the training videos with subtitles on there also. It is important..... for customers to know we are able to help them. We really take the American product and make into a Ukrainian version...” (P1)

Underpinning this immense effort has been carefully selected, boundary agents and internal specialist salespeople.

7.2 Daughter node 49: Antecedents.

The case companies all have a strong tradition in the education market, except for PC6 (Iceland) and PC4 (UK). The smaller SMEs have established their businesses on a network of contacts established from their previous careers as educators. The larger SMEs are a second or third generation of ownership and still retain their focus on the education market. Both groups of distributors have established warehousing and distribution facilities, repair facilities, pedagogical capabilities, localisation resources and workshop/training competencies (summarised in Table 0.12

Table 0-12 – Summary of antecedents in case companies

Case SME	Location	Employees	Use boundary agents	Science degree(s) holders in the firm	Generation of ownership	Product range
PC1	UKR	30	Yes	5	1st	Mixed
PC2	CZE	5	Yes	5	1st	Science only
PC3	NLD	54	Yes	1	3rd	Mixed
PC4	GBR	8	No	0	1st	Mixed
PC5	DEU	18	Yes	3	2nd	Science only
PC6	ISL	12	No	0	2nd	Mixed
PC 7	SVK	3	Yes	2	1st	Science only

Case SME	Location	Employees	Use boundary agents	Science degree(s) holders in the firm	Generation of ownership	Product range
PC8	TUR	48	Yes	12	2nd	Science only
PC 9	BEL	14	Yes	3	2nd	Science only
PC10	FIN	3	Yes	2	1st	Science only
PC11	POL	2	Yes	0	1st	Science only
PC12	HRV	12	Yes	0	1st	Mixed
PC13	EST	10	Yes	2	1st	Science only

7.3 Daughter node 50: Asset and resource orchestration.

All case companies emphasised the need to have flexible workers able to multitask to enable the firm to remain agile in the face of competition. This point is emphasised by PC12's CEO (Croatia):

"...We are a small company, so each person will be aware of what is needed. Each person has their own role, and they work well and help each other. This is so important for a small company..." (P20).

The importance of organising limited resources in SMEs to maximise their collective impact is explained by CEO PC1 (Ukraine) as asset orchestration in the firm:

"...The pedagogical managers can sometimes take a sales role. They can go to school and perform workshops.....but they are really selling! They can also build relationships with customers and ministry workers. This is also the job for the sales manager.....but she has to cover all of Ukraine.....so she must sometimes concentrate on larger projects.....this can be computer systems for a school or district. This takes time, so...for the more technical products, the pedagogical workers [who were former teachers] are happy to help.....they are still secret teachers."(P1).

When the competencies do not exist in the firm, the option is to buy a smaller rival and integrate those capabilities with the new firm as the GM of PC3 (Holland) explained:

"...Employee A from Competitor A to say he is unhappy with the new regime who have bought the company, and if we take on Genisys, he will move to us. In this way, we will acquire that company and also assimilated the expertise that we do not have currently. They are quite strong in the secondary school science market, so it will be good for us. We will use the expertise of the key personnel and integrate them into our own company..."

A similar approach is adopted in Turkey by PC8, except instead of purchasing a company their strategy to develop their own capabilities by employing more boundary agents with the specific skills they are lacking:

“...We are very weak in Biology and Chemistry (but not so much), so we need to use this same business model to find and work with teachers whom we can employ as consultants to help us. You has been expanding the range into these science areas, and we understand that we are missing a big part of the market by not having these markets. We have always been physics focussed and also, but smaller, engineering products. Being a physicist myself, I used the network of teachers and professors I have known personally to help with product development and curriculum materials, or suggestions on what to produce. In the past, the physics department in the University would just call me and ask me to come and see them...We need to change now and use more and younger generation teachers as we focus more on secondary schools than universities...” (P13).

7.4 Daughter node 51: Division of responsibility within the firm.

Building on previous findings, SMEs require a flexible workforce. Therefore, it was not unexpected that the findings would emphasise the need for the firm to continue to build and re-configure capabilities in the firm. The need for specialised employees such as software engineers to also assist in sales functions was referenced by the P9 of PC6 (Iceland):

“...We have 12 persons working here. They are split between engineers and programmers mostly. So, they would have a technical educational background. We then have a marketing manager and a sales manager. They would all be technical in some respect...”

The approach in a larger SME is similar, except engagement between employees are handled at a departmental level. However, the engagement with boundary agents carries a greater emphasis on how the company plans its marketing and strategy, according to P4 of PC3 (Holland):

“...Marketing will always ask the person who is a specialist in a particular area to help layout the catalogue. So, employee “X” [a former teacher and now full-time employee] will oversee everything to do with Genisys – catalogues, newsletters, exhibitions. We also plan to have one specialist in each area; science may have more than one because physics is very different to biology. These people will be here to support the salespeople. The salesperson will go to a school and see if there is an interest in, say, data logging. If there is, the specialist [who will be an ex-teacher] will follow up and go there if necessary and do a demonstration of the product...”

7.5 Daughter node 52: Educational background of workers.

In 12 of the 13 dealers, employees who were in contact with customers possessed a university degree in some scientific discipline. The smaller SMEs relied heavily on a small number of employees with higher degrees and appeared to be more specialised in specific areas of science. The larger SMEs employed graduates with teaching backgrounds, but not necessarily from science backgrounds. Where there existed a gap in the firm’s competencies in science, boundary agents were more

frequently used. For example, PC12's CEO (Croatia) explained his firm's reliance on boundary agents:

"...I was a secondary school maths and economics teacher, so all my contacts and my understanding of the teachers and the curriculum is here..." (P19).

In Germany, PC5 uses its specialist staff to support the field sales personnel. The requirement is that each salesperson was once a teacher in any discipline, discussing at a lower-level data logging in the school. If there is a subsequent interest, a specialist employee (or boundary agent) will then take over:

"...Yes, all of our salespeople, in Holland have all been full-time teachers at some stage of their career. Our only requirement is that they have been a teacher once, the subjects they have taught has been not so important. This is because the range of products we sell (except Genisys) does not need to be technical. However, not that is different – because of these new developments...." (P6).

Building on the literature review in KAM and specialist salespeople, in all of the 11 of the 13 case study companies the importance of the technically competent sales agent in front of the customer was evident. Also, the practices of the 'hard-sell' were especially frowned upon. The relationships between the technical salespeople and the boundary agents were also highlighted as being a strong foundation for effective knowledge transfer and VRIO resource development.

7.6 Daughter node 53: Interrelationships between workers.

Developing a customer-focused culture rather than product-focused was the preferred option for 10 of the case-companies. The remaining firms used a dual focus approach because of their more significant market positions. The implications for developing human resources as a source of sustained competitive advantage has some basis in previous studies (For example, Wright, Dunford, & Snell, 2001; Wright, McMahan, & McWilliams, 1994).

The CEO of PC3 (Holland) refers to a multi-skills approach:

"...We have changed around departments and employees according to the needs... We try and make sure that in certain areas or groups that as many people are as flexible as possible and can share each other's jobs. With Genisys.... we have for the first time a product that is totally different to what we are used to..." (P3).

The Dutch firm relied heavily on a dynamic relational approach, harvesting the skills base first to enter the market as a new entrant, and then, to address the concerns of teachers having to teach STEM will no curriculum or training provided by the Dutch Authorities. The Ukraine dealer also leveraged

the diverse skills base with the firm and complement shortages through boundary-spanning activities. This was a common response from 11 of the 13 case-study firms, where they would consciously build their capabilities on knowledge and expertise from boundary agents.

7.7 Daughter node 54: Path dependency.

Having an established reputation in the science education market was cited as a key factor of success by all case-study companies. Experience and technical expertise, built and developed over the years were also regarded as a capability that satisfied all of the requirements of VRIO. However, having a background in a different industry was not regarded by the CEO (P9) of PC6 (Iceland) as an impediment to future success in science education. With a core business of collecting, storing and analysing data on behalf of a worldwide network of industrial clients, the firm regarded the data collection in schools to be a natural extension. Although there are no formally educated scientists in the firm, P9 is confident that the skills of his engineers can be transferable to the education market with the correct guidance:

“...We have a strong technical base in our company. I feel confident that we have the ability to transfer that to schools as well. If we can get some of the teachers on board, and the technical support we can back them up with, will be a strong value offering to the teachers of Iceland...”

In contrast, PC8 (Turkey) has been in the education business for many years and have established a strong reputation based on quality and service. They have traditionally manufactured “traditional” equipment and have only been a distributor of data logging for a relatively short period. Their established practices of working closely with customers from a solutions point of view have been transferred to the promotion of data logging equipment.

PC2 (Czech Rep), PC7 (Slovakia), PC12 (Croatia), PC10 (Finland), PC11 (Poland) and PC13 (Estonia) has all been founded by individuals who were once full-time teaching professional in science-based subjects (except PC12). These firms are smaller SMEs and fundamentally understand the needs of the science practitioner. Their preoccupation with technical support, training and pedagogical materials is reflective in their approach to marketing and sales.

7.8 Daughter node 55: Strategic Alliances.

Strategic alliances were an alternative method of gaining essential knowledge from the market for 8 of the case-study companies. In this context, strategic alliances refer to “partnerships” with third parties such as trade and educational associates and MNC tech companies.

Three of the case companies (PC3, PC4 and PC13) stressed the benefits of strategic alliances. In the UK, PC4 work closely with the Institute of Physics (IoP), Royal Society of Chemistry (RSC) and the

Association of Science Teachers (ASE) as a method to exploitative learning. The firm also encourages collaboration with selected high-profile schools (For example, Charterhouse and Harrow), where educators are happy to test new products and write reviews for education journals. The CEO of PC4 views such alliances as being a higher priority than engagement with boundary agents. A similar alliance is employed in Estonia (PC13), where the firm supports a teaching support centre that serves all of the country based at the University of Tartú in the use of data logging equipment.

PC7 forges a unique alliance in Slovakia, where a local publisher of science textbooks uses the resources and imagery supplied by the firm. The CEO (P12) describes the relationship:

“...We have worked since last year with a publisher of textbooks here, and they came to us to ask if we could help with the experiments in the book. In the end, they used the local Genisys experiments and the images we gave them on setting up data logging.... we get requests from schools when they are curious about what they are.....it has been a good relationship...”

PC3's P3 (Holland) regards their relationship with the supplier as more of an alliance because the brand brings them certain credibility as they try to enter a new market segment. Similarly, strategic partnerships with companies such as Philips, who have a vested interest in the promotion of science in Dutch schools, bring mutual benefit to both organisations:

“...It is nice, and we feel we are part of something bigger ...and it allows us to build a different reputation in the market and with our customers. Until now we are just the same as our competitors ...except maybe.... we are bigger and can carry more stocks and ship quicker...but apart from that ...no big difference. With having an innovative and market-leading innovative product.... we are feeding off your innovation and just reflecting it to our customers. This the huge benefit to us...and helps establish links with some of our bigger industry partners....”

In summary, the central themes (Table 5.17) that have dominated the discussion with the distributors have been the importance of boundary agents and the effectiveness of conducting workshops as part of a sales and marketing strategy. Also, information gleaned from conducting workshops, and other activities carried out by boundary agents, are also crucial in assimilating essential knowledge for the firm and contributing to the creation of VRIO resources that customers perceive as having value. The exception is the UK distributor, who still values the contribution of workshop activities, but relies more on traditional marketing activities and support from the exporting company

Table 0-13 – Main themes from research.

Theme	Main Themes (Tree nodes)
1	The importance of using teachers as boundary agents (spanners) is a highly successful method of selling, especially is combined with specialist salespeople through a customer focusses strategy.
2	The firm has greater credibility in the market if they employ teachers (part-time or full-time) as boundary agents (spanners) and are a primary source of information.
3	The localisation of products in the host market is of critical importance, especially if the mother tongue is not English, although not as important in English speaking countries.
4	Boundary agents can have significant input into the localisation of product and for VRIO capability building in the case-study firms.
5	Boundary agents can have a positive effect on the relationships between the exporter and localised distributor through information exchange.
6	Adding value that satisfies the conditions of VRIO better positions the firm to bring value back in the form of superior profits than rivals, much less customer churn, and temporary or sustained competitive advantage.