Unmasking Organisational Agility: An Exploration of Characteristics and Influences

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Abstract

The essence of agility is how organisations can remain in tune with and respond to changes within the operating environment, but achieving these aims becomes more problematical when the environment is turbulent or fast moving. Whilst the origins of organisational agility lay within manufacturing, turbulent conditions are not restricted to that sector. Whilst definitions of agility are not hard to come by, just what makes an organisation agile is less clear. There is a consensus that agility is not homogenous but is situation-specific and comprises of a number of characteristics, with the importance of each, idiosyncratic to every organisation. A gap in the literature exists in that, whilst the defining characteristics may be unique to each firm, there is no agreement on what they might be, with virtually no attempts made to quantify how one organisation might be any more or less agile than its peers. The primary aim of this study is to devise a means of measuring agility and this is supported by a number of objectives which make a contribution to theory and practice.

Objective 1 – To examine the existence of factors determining organisational agility

The literature suggests agility is enabled by a range of hallmarks which are idiosyncratic to each organisation, but fails to ariculate what these might be. To bridge this gap, a survey was conducted to test the existence of agility characteristics drawn from the literature. Agility is contested (Bottani 2009) so the hallmarks identified in the literature were tested with industry practitioners using semi-structured interviews. Understanding the relative importance of agility factors addresses a gap in the literature but additionally has commercial appeal for organisations with agile ambitions.

Objective 2 – Explore ways in which organisational agility can be quantified by the development of a measurement tool

Although the literature does not specifiy the hallmarks of an agile organisation, it does suggest firms experience varying need to be agile and this makes the necessary characteristics heterogenous. Reviewing the literature highlighted virtually no attempts to quantify agility which would allow comparisons to be made across organisations from varying backgrounds. Having identified key characterisitcs of the agile firm in objective 1, the Corporate Agility Matrix (CAM) aims to quantify the importance. This

contributes to theory by addressing the absence of a dynamic measurement tool which allows comparisons to be made across organisations.

Objective 3 – Using data, verify the validity of the model

The CAM has been tested by means of a survey encapsulating the views of 40 practitioners across the management spectrum drawn from a range of UK service based organisations. A tested model addresses the issue of which agility characteristics might be most relevant to certain types of organisation. Morevoer, the CAM can be used as a diagnostic tool to identify 'quick-wins' and a means for managers to allocate resource to areas most likely to yield agile outcomes.

Objective 4 – Using exploratory methods, examine agility from the perspective of practitioners

Bottani (2009) highlights that agility is often considered through 'fuzzy logic' which is fully reflective of its contested nature. This study evolved into an abductive enquiry using follow-on interviews drawn from the participating organisations. This allows me to build an understanding of the primary capabilities *practitioners* felt were needed to be regarded as agile and to consider how consistent these were with the literature. Using exploratory methods such as interviews furthers the theoretical base by identifying emerging themes, with one in particular (risk tolerance) being highly relevant.

Objective 5 – Present a redefined model of agility to assist development of improved practice

Goldman, Nagel and Preiss (1995) are pioneers of agility, producing a landmark publication which has been widely cited by subsequent researchers. Their assertion that agility is constructed around four elements ('pillars') still appears relevant, but there is evidence of devergence from the original model which is not surprising given the significant changes in the competitive environment since 1995 when the work was published. This study aims to update and enhance that seminal work, furthering the theoretical base.

Whilst understanding the importance of agility factors has commercial application for industry, the CAM makes a contribution to knowledge by defining the component parts of agility and provides a means for measuring the relative importance of these. This sets

a platform for a longitundinal study and allows a means of comparison across organisations.

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Chapter One

Introduction

Development of concepts – the obsession with short-termism

Glenn (2009) regards agility as a key differentiator between organisations and draws on research by the Economist Intelligence Unit (2009) to highlight almost 90% of executives consider agile capability as essential for success in rapidly changing competitive environments. Moreover the paper also alludes to research by the Massachusetts Institute of Technology which identifies agile firms as growing revenue 37% faster and reporting profits 30% higher than firms without agile characteristics.

Hayes and Wheelwright (1979) suggest firms gain competitive advantage by aligning product and process life cycles and identify four elements (cost, quality, dependability and flexibility) as key drivers, but highlight trade-offs as inevitable between cost/dependability and quality/ flexibility, though Fliedner and Vokurka (1997) assert that the notion of trade-offs carries less relevance in today's dynamic environment. According to Vokurka and Fliedner (1998), the competitive environment has changed to one where markets are international in nature, constantly changing and customer driven. Customers have also changed with expectations of more variety, superior quality, more reliable service and rapid delivery. This combined with technological advancement have served to shorten product life cycles. Dove (2001) agrees that technological advancement has served to transform the business environment but furthers the argument by suggesting turbulence and uncertainty represent a new normality. Yaghoubi et al (2011) agree by acknowledgement that whilst change is not a new phenomenon, the rate of change has accelerated and the most effective way for firms to overcome the challenge of this altered landscape is to build agile capability.

A definition can be sourced from the Oxford English Dictionary (1990) which defines agility as follows:

Nimble, quick moving, lively

Cross referencing agility to a thesaurus subdivides the synonyms into two discrete sensory categories, nimbleness and acuteness. Nimbleness very much encapsulates the dictionary definitions of implying speed but acuteness further suggests alert and clever. Zaheer and Zaheer (1997:1497) define alertness as 'proactive attentiveness to information' in relation to private information or more colloquially 'having ones' antennae out'.

Vokurka and Fliedner (1998) define agility as the ability to deliver low cost, high quality products with short lead times in varying volumes. Moreover they support the view of Goldman, Nagel and Preiss (1995) that agility has aspirational dimensions and as a consequence the search for agility is in itself an endless quest. Hormozi (2001) positions agility as the latest period in a timeline which started with craft production followed by mass production and lean (Womack et al 1990). Kidd (1994) proposes a linkage between agility and innovation to the extent that innovative capability will become the primary source of competitive advantage for the agile organisation. Innovation is however more clearly defined and concerned with alteration, invention and transformation. Krishnamurthy and Yauch (2007) support the views of Bennis and O'Toole (1993) and Lawler (1997) that smaller organisations are generally more responsive and nimble than their larger counterparts so a valid question would be how large organisations might be able to capture the advantages associated with being diminutive. Kirby (2010) refers to a study by Benner (2010) which suggests financial analysts display nervousness around radical innovation but show a propensity to invest in firms which merely extend existing technology. This is also reinforced by the way analysts are rewarded, which tends to be based upon short term performance, thus they carry less personal risk by investing in known technology or line extensions than by the short term cost and risk associated with invention. A dichotomy seemingly exists in that the benefits of innovation often do not flow to the architect of change (Kay 1993), then it would seem incongruous for organisations to have ambitions in this area and even more unlikely for strategists to advocate such an approach.

Haneberg (2011) identifies five benefits flowing from agile capability, although none are quantified by the author:

- Improved competitiveness
- Higher revenues and superior results
- Heightened customer satisfaction

- Enhanced employee motivation
- Operational efficiencies

Dove (1995) questions whether the efficacy of agility should be evaluated in relation to outcomes, since actions that might be considered nimble would be futile if they caused long term endemic problems within the organisation. The relevance of this is that according to Johnston (2009), longevity for organisations is elusive. For example, 10% of US organisations fail every year and this is mirrored amongst large corporations worldwide – of the top 100 global companies in 1912, more than 80% had disappeared by 1995.

A high proportion of senior management teams around the world seem to have developed an infatuation with share price performance as a measure of success and this is very much focussed on the short-term, hardly surprising given that the average tenure of a Chief Executive in the west has reduced from ten years in 1995 to just six (Barton 2011). Moreover Govindarajan and Trimble (2011) argue most pressure is applied to CEOs by stock markets which seek earnings reliability. Measurement drives behaviours and a natural extension of this is that share price is how many CEOs are measured. Barton agrees with Ariely (2010) who suggests CEO performance should be evaluated using long term measures (e.g. innovation and efficiency) and a broader mix such as customer satisfaction or new patent pipeline.

In the next section I explain why agility is becoming so important for the modern organisation and why previous studies have failed to address a gap in the knowledge base.

Rationale for the research

Whilst there is commonality around the view that agility is concerned with an ability to scan and respond to the external environment (Jackson 1997), and that agility is composed of a collection of facets (Sarker et al 2009), there is no clarity on the precise composition of agility nor the relative importance of the component parts in diverse organisations. Zhang and Sharifi (2000) suggest that, even within the same sector, organisations face varying degrees of turbulence within operating environments, meaning agility drivers will vary. Moreover, the degree of agility required (agility need level) is commensurate with the prevailing level of change and thus the mix of competencies required is heterogeneous. As the environment becomes more

turbulent and product life cycles become shorter so the need for organisations to respond quickly intensifies but with it comes the need for measurement. The objective of the research is to build a testable proposition by gaining clarity around the facets of agility, to apportion a weighting system between these which will allow comparisons to be made across industries and understand why variances might occur.

Given that previous studies of Organisational agility are either sector specific (Engineering Youssef 1992), internationally focussed (Van Oosterhout et al 2006) or a specific element of the value chain (Sarker et al 2009) this provides the opportunity to consider agility in an international context and whether the widespread use in relation to manufacturing can be extended to service based enterprises. Whilst agility has been assessed in relation to manufacturing (Goldman et al 1995, Backhouse and Burns 1996, Fliedner and Vokurka 1997), contextually this carries less relevance for a service based economy such as the UK. This is because GDP has grown fourfold since 1949 (PWC 2009) in the UK but this belies a manufacturing base which, despite growing in absolute terms, has been in relative decline, accounting for only 14 % of economic output. This provides a useful context for the objectives of this research and means there is a need to redefine the key factors underlying organisational agility, to structure these so some sort of significance can be attached to them and to broaden the output measures to build a rich picture of agility. This can then be used as a basis for a longitudinal study to establish whether particular industries, sectors or types of organisation are more successful in cultivating the benefits of agility than others. Similarly the notion that smaller more embryonic companies anecdotally appear able to mobilise more rapidly than their larger, more mature brethren needs to be substantiated.

On reviewing the extant literature, it is apparent significant gaps exist to the extent that there appears to be incongruence around the behaviours or traits needed for a firm to be regarded as agile. Moreover the literature highlights a dearth of research suggesting agility could be measured numerically. By addressing these two issues, the fundamental aim of the study is the design of a tool which identifies and measures the various component parts of agility and provides an overall agility score, thus allowing comparisons to be made across industrial sectors and ultimately geographical boundaries. As a result of the study, I have designed and tested a model which captures and provides a means of measuring the main component parts of agility.

In the following paragraphs I aim to set out the research objectives and whilst I wished to retain the original integrity of the study (i.e. quantitative in nature), the study did naturally evolve into a mixed methods approach to data collection with the objective of building a better understanding of just what agility means to business and just what workers felt the hallmarks of an agile enterprise would be.

The exploratory framework

The most significant work in the field of Organisational Agility is Goldman et al (1995) who distil agility, which is aspirational in nature, into four main constructs – enriching the customer, organising to master change and uncertainty, co-operation and leveraging the impact of people and information. Goldman et al (*ibid*) present a model of agility which has become a landmark publication and which has been drawn upon by many subsequent researchers. However, it is evident the four pillars are supported by a number of agility characteristics which carry significance for organisations of varying backgrounds, with the exact level of importance idiosyncratic to each.

The basis of the work by Goldman et al (*ibid*) is an audit of agile capability within the manufacturing industry but I wanted to test the relevance within the service arena, and additionally whether the basic structure used remains relevant. Reliance on the Goldman model might imply that the scope for exploration of agility is in some way limited. Whilst using the Goldman work as a cornerstone for developing a measure for agility, I was cognisant that organisations operate in a very different competitive environment to that in 1995 when the work was published, meaning an objective of this study is to update and enhance that work, furthering the theoretical base. Whilst the positioning of agility around four pillars appears to hold congruence today, a dichotomy is evident that some views of the authors appear antiquated which is perhaps to be expected as a consequence of more up-to-date literature emerging. Nevertheless, using the Goldman work as a starting point for my research has the advantage of adopting a previously tested model, albeit in manufacturing, constructed by recognised subject matter experts and this allows me to test the facets of organisational agility and assess the relative importance of these.

Goldman et al suggest the context to organisational agility is one of two paradigms. The old paradigm is consistent with standardisation and mass production, typically being concerned with driving efficiencies. The new paradigm however suggests consumers are more concerned with high quality, low cost bespoke products. They contend that the

fundamental premise on which organisations exist has shifted, meaning functions such as management, production and distribution should be positioned around customer perceived value, or in essence, demand led. Their definition is partly reflective of this (a comprehensive response to the business challenges of profiting from rapidly changing, continually fragmenting, global markets for high-quality, high performance, customer configured goods and services). Whilst the definition does not explicitly spell out the need for affordability, this is very much the tenor of the research with the authors arguing an end to the traditional trade-off between quality and cost.

The authors argue that whilst the definition suggests a 'comprehensive response' is predicated on four pillars, some supporting elements are clear hallmarks for the agile enterprise. They suggest the primary objective of the agile organisation should be to enrich the customer experience by offering solutions which satisfy diverse needs. This means that where the old paradigm was very much focussed upon product, the customer proposition should now encapsulate product, service, delivery and after-sales. They also offer an explicit view that providing solutions can only be achieved through co-operation, both internally and externally, on the basis that no organisation has all the necessary capabilities to service all clients and all elements of the value chain consistently. Inextrciably linked to solutions and inherent in the definition of agility is another central theme, mass customisation. Here Goldman et al (*ibid*) regard the ability to provide a range of quality products, adapted to varying customer demand, regardless of order size, a concept totally couter-intuitive to the old paradigm of mass production. Indeed the importance of this is not lost in the author's conviction to label the new paradigm as the 'mass-customisation' era.

The Goldman research considers the context for agility as being built around providing better customer outcomes but one of the enablers for achieving this is the way in which the organisation is structured. They point to a need to remove managerial layers if agile ambitions are to be realised, known as delayering. This has has resonance with the industrial revolution since structures have historically reflected the aims of the mass production era, however the authors point to agile manufacturing needing a structure supportive of customisation and rapid decision making. Indeed agility is best achieved by a decentralised organisational structure where decisions are made closer to the customer and business units can react speedily to changes in the environment. Passing decision making down the organisation in this way has a number of benefits such as improved motivation,

cultivating an ethos that satisfying customers is the responsibility of all within the organisation and allowing problems to be resolved rapidly and at source.

In addition to structure, Goldman et al (*ibid*) also point to people as being the hallmark of the agile firm. More specifically they highlight the need for motivation and although they do not explicitly single-out the importance of information, this is very much implied through the linkage to people. The authors regard the behaviour of employees as commensurate with the clarity given to them by managers around how their performance will be measured. Given the importance placed upon co-operation and the use of multi-function teams within agile organisations, performance measures need to reflect this. They continue that reward is an important part of creating an agile culture and this should include part of remuneration being contingent upon team performance or activity rather than that solely of the individual. The configuration of people and information and the subsequent impact these have on profitability, is a key consideration for the agile firm with Goldman et al going on to suggest an agile workforce is assembled from people who are 'knowledgeable, informed, flexible and empowered' which translates into a workforce able to rationalise what it is doing, can continually develop new skills and uses these to respond to changes in the environment.

This appears to be the essence of the agile firm – the interaction between changes in the environment and the efficacy with which the firm is able to make sense of change signals and respond accordingly. The authors however are unequivocal in their view that the real arbiter for whether a firm is agile or not it has the ability to respond to change of an unpredictable nature. Goldman et al (*ibid*: 99) see this as analogous with an emergency room where multi-functional teams are assembled from various areas within the business often at short notice, and then disbanded.

The essential elements of my study are to test the assertions made in 1995 by Goldman et al (*ibid*) to establish if the hallmarks of an agile firm are strictly correct, remain relevant and indeed if the foundations in manufacturing carry relevance to service based organisations since I feel the need to be agile is not confined purely to industrial sectors. In the next section I start to expand on this by looking at the research objectives in more detail.

An overview of the research objectives

The agility of an organisation refers to how efficiently it can respond to change. The continued development of agility carries an allure for corporations, particularly within the private sector, although this commercial perspective is becoming evident within the public sector. Developing an organisation that can respond to, or even anticipate, changes in the competitive landscape carries strategic importance. Sherehiy (2008) suggests many definitions of agility exist in the literature but the basic premise is one of being able to adapt to continuous and unpredictable change in the external environment. The purpose of the study is to address the research question which is to establish the key factors which determine agility and the importance placed upon these across various sectors. The limitations of previous studies into Organisational Agility provide the opportunity to consider agility in a wider context.

The aim of the research is to produce an assessment tool to allow comparability of agility across sectors and international boundaries as part of a longitudinal study. This is achieved by adapting an agility model, originally developed for the manufacturing industry, to test for efficacy within the service sector. In terms of providing a focal point, the research objectives are:

Objective 1 – To examine the existence of factors determining organisational agility
Objective 2 – Explore ways in which organisational agility can be quantified by the development of a measurement tool
Objective 3 – Using data, verify the validity of the model
Objective 4 – Using exploratory methods, examine agility from the perspective of practitioners
Objective 5 – Present a redefined model of agility to assist development of improved practice

The study aims to set the basis for a longitudinal international study by establishing a baseline which identifies the facets of agility, measures these in terms of importance and engages with a diverse range of organisations to provide an agility score, a process which can be repeated over time to build an understanding of the phenomenon. Integral to this is the design of an assessment tool which measures the relative importance of agility factors across participating organisations, drawn from a variety of industries and sizes.

In terms of structure, chapter two considers the literature in detail and provides context for the seminal work on organisation agility, used as the basis for this study. The work of Goldman et al (1995) was originally used as the basis for an audit of agile capability in the manufacturing industry but I aim to test the relevance within the service arena, and additionally whether the basic structure used remains relevant. The work of Goldman is structured around four basic constructs – customer, structure, co-operation and people, which I refer to as 'pillars' and I use these as a means of structuring and ordering the literature I reviewed, a basic theme I continue with in subsequent chapters. Within the literature it also becomes evident that agility is made up of a number of characteristics. The problem lies in that there appears to be no consensus on just what these are, and in any event they appear to be idiosyncratic to each organisation. Therefore within chapter two, I introduce those I feel are plausible, and catagorise these within the four pillars. This is important since it allows me to design a basic structure for the measurement tool, and subsequently test the importance of each trait amongst practitioners. Finally within this chapter I am able to provide an early theoretical model for agility from one of the pioneers of agility and whilst this is also focused on the manufacturing sector, it does allow a means for comparison against my own model, which appears in chapter six.

Chapter three looks at the methodology used and aims to provide insight into how the study evolved from purely quantitative in nature to a mixed methods approach. It also sets out the limitations of previous studies which have their origins within manufacturing with this bias remaining a prominent theme throughout the literature, so the chapter sets out my motives for testing the importance of agility on service based organisations, and just as importantly comparing agile capability across private and public sector organisations, which I can find no evidence of having been considered within the extant literature. It is also evident that very few attempts to quantify or measure agility exist, so chapter two aims to provide some detail about how I approached the design of a measurement tool and how this was piloted. One issue I experienced, in common with many researchers, was access, since the initial attempt to build a databank of participating organisations was undermined by a paltry response rate from my initial mailing. This was overcome by the use of purposive sampling in an attempt to build a 'balance' of participating organisations.

Within chapter four, I present the quantitative data and start to identify any areas of significance, particularly focusing on any differences between the private and public sectors. This chapter is also structured using the four pillars format, with the quantitative

data presented consistently within each pillar along three dimensions. The first is establishing which agility characteristics were perceived to be important, drawing on the importance scores from the questionnaires. The second element is the 'difference between variables', where I test the contrast in perceived importance of agility traits between various populations, the most notable being the private and public sectors, but additionally whether perceptions differ across managerial strata. The third dimension is the 'relationship between variables' where I aim to establish which agility characteristics are correlated. The second element of the chapter is to present the key outcomes from the qualitative work by highlighting the most commonly cited characteristics which practitioners, drawn from various organisations and managerial bands, feel provide the hallmarks of an agile organisation. Within the follow-on interviews there are a number of traits which participants feel are necessary in order for a firm to be regarded as agile, but for reasons of brevity, I consider the four most commonly emerging. In addition I reveal an emerging theme, one which was felt to be an important determinant of agility, but which was not considered within the Goldman et al (*ibid)* model, nor the wider literature. Chapter four also provides additional insight from one organisation in particular (Midland Heart) which had a stated ambition to become more agile and the difficulties associated with making this a reality. This forms part of the qualitative data by way of an interview with the Head of Change and Transformation.

The discussion and analysis of the findings is examined in chapter five and here I am able to articulate the outcomes from the measurement tool. The chapter retains the structure evident throughout the study with discussion segmented within each of the four pillars and within each individual agility trait. In respect of the four pillars I am particularly interested in which have the greatest influence on agile outcomes, an area the Goldman et al (*ibid)* study fails to consider, but additionally how each organisation perceives its achievement against the four pillars. When considering each agility trait in more depth, the aim is to identify which elements assumed the greatest importance within the survey but additionally I consider whether issues such as firm size have any impact on agile characteristics. By moving through each of the agility traits identified within the literature in this systematic way, I am able to better evaluate their relevance and this allows me to refine the corporate agility matrix (CAM).

Finally in chapter six, I bring my findings to a conclusion. This chapter starts with a recap of the research objectives and provides an assessment of how I believe these have been met. I then take the opportunity to advance a redefined model of organisational agility, which I believe makes a contribution to learning since it is

predicated on input from a cross-section of modern service based organisations. The chapter concludes with my final thoughts and the difficulty of reconciling the inconsistencies I experienced from the quantitative and qualitative phases of the study.

Chapter Two

Literature Review

Introduction to the chapter

The seminal work in the field of Organisational Agility by Goldman et al (*ibid*) identifies four main dimensions to agility – enriching the customer, organising to master change and uncertainty, co-operation and leveraging the impact of people and information. For the purposes of this study, these are distilled into – customer, structure, co-operation and people, although within each of these there are several components. Given the importance of this much cited and seminal work, this will form the basis for the analysis of literature. Chapter 2 starts by explaining how previous researchers define agility and here many of the inconsistencies evident in my own study start to emerge. I then consider each of the agility characteristics I identified as being relevant to the modern organisation. These are drawn from the original Goldman study where the authors make specific reference to it but augmented where the body of literature highlights a relevant issue that was overlooked by or supersedes the Goldman study. The chapter is structured using the four pillars identified from the Goldman work, starting with customer related agility issues. This is an important starting point as the authors explicitly regard agility as being a means to better serve customers. I then describe literature realting to structure which assumes prominence within my study and incorporates configurational theory as a basis for agile capability. The chapter then explains the issues around cooperation which Goldman et al (*ibid*) also regard as important, on the basis that no organisation has all the requisite skills and information to meet the demands of all customers. I conclude with the final pillar, which considers the extent to which an organisation can ever be truly agile without the necessary people related attributes.

Defining agility – understanding the terrain

The origins of organisational agility can be traced back to the Iaccoca Institute, Leigh University in 1991 (Hallgen and Olhager 2009) but whilst there appears to be some agreement on definition (Sarker et al 2009), what constitutes an agile organisation is more nebulous but Greene et al (2008) relate this to indentifying and responding to customer need, improving time to market and the ability to prosper in rapidly changing markets. Kotter (2012) regards agility as the ability to seize opportunity and

simultaneously avoid threats 'with speed and assurance'. The CIPD (2011) suggest agility is the state of being 'change-ready' with an ethos of being prepared to keep moving, changing and adapting. Whilst the CIPD regard all levels of the organisation as being responsible for developing this capability, their view on agility makes no reference to response capability which contrasts with the views of Overby et al (2006) and Shalit and Yaniv (2011). Sarker et al (2009) suggest the term agility was first used within manufacturing industries but this has become prevalent across a range of disciplines such as supply chain and information technology (IT). The authors suggest that whilst there might be agreement on the wider definition, agility is not homogenous and is in fact an amalgamation of a number of dimensions, or facets. Dove (2001: 9) agrees by suggesting 'agility does not come in a can. One size does not fit all. There are no five common steps to achievement', mirroring the views of Haneberg (2011:50) who suggests agility 'is not simply a state of mind: it is a way of working' and continues by asserting that rather than being a singular trait, agility is systems based.

The lack of consensus around composition of agile characteristics is endorsed by Shalit and Yaniv (2011) who point to a dearth of research on the factors which enable firms to be agile but the authors are unequivocal in their view that agility flows from a combination of effectiveness (strategic decisions) and efficiency (rapid change) and that three primary elements affect this – firm size, hierarchy and age. Whilst the Shalit and Yaniv study identifies the gap in the knowledge base as being what nurtures agility (p29) and attempts to isolate this, there is a heavy reliance upon older research to substantiate this with over 70% of references greater than ten years old and several landmark authors (for example Dove, Fliedner and Vokurka, Gunasekaran, Kidd, Sambamurthy, Van Hoek) omitted. Jackson and Johansson (2003) regard agility not as an outcome but as a means for competing effectively in environments characterised by change and uncertainty.

Sherehiy (2008) positions the importance of agility but acknowledges the attributes of workforce agility is under-researched, with an even lesser understanding around organisation characteristics which bring about agile performance in the workplace. The author does however offer a view that agility is contingent upon two basic capabilities – speed and response to change, a view shared by Hormozi (2001) who postulates that organisational agility relates to an ability to embrace change and adapt 'rapidly and easily' and thus benefit from changes in the environment. Sambamurthy et al (2003) agree with the views of Smith and DeGregorio (2001) by referring to entrepreneurialism in an agility context, such that entrepreneurial firms are characterised by an ability to

integrate existing knowledge with results of experimentation and interpretation of the external environment, detecting opportunities and responding to these. These sensing and responding capabilities mirror those identified in the agile firm (Overby et al 2006). Zaheer and Zaheer (1997) qualify this by relating entrepreneurialism to performance through access to and use of information but contend value is derived from use of information from network ties rather than entrepreneurialism in isolation.

Kidd (1994) refers to agility in the context of the manufacturing sector but highlights three primary constructs for the agile enterprise:

1. Identifying a change in the competitive environment
2. Response capability
3. Integrating technology with highly knowledgeable, empowered and motivated people

Whilst Kidd (*ibid*) is much cited in the field of organisational agility and one of the early pioneers, his work is focussed upon the manufacturing sector with a significant part of his research dedicated to technology and systems configuration but given the exponential change witnessed within this sector since 1994, many of the concepts seem antiquated and largely redundant although several of his more fundamental principles, such as concurrency do still appear relevant.

Perhaps the most influential writers on the issue of agility are Goldman et al (1995), who are extensively cited. They identify four key components of agility, though implementation of these would appear to be context specific with Mason-Jones et al (2000) highlighting the fast paced and volatile fashion industry where the polarities of stock shortages and excess inventory are punitive:

1. Enriching the customer (customer) – understanding the idiosyncratic needs of customers and responding to these through solutions rather than products in isolation
2. Co-operation – on the premise that one organisation in isolation rarely has all the requisite skills and competences to service customer need, forming alliances both internal and external to the organisation
3. Organising to master change (structure) – to cope with the unpredictable nature of changes, organisations need to structure optimally, using cross-functional

teams and delayering where possible, configuring product development concurrently rather than sequentially

4. Leveraging the impact of people and information (people) – placing an emphasis on education, development and empowering staff to make decisions nearer the customer

Goldman et al suggest the context to organisational agility is one of two paradigms. The old paradigm is consistent with standardisation and mass production where organisations developed or adopted systems such as 'lean' to further efficiency and eliminate costs according to Vokurka and Fliedner (1998). As these were concerned with improving the efficacy of pre-existing processes, by making them more efficient or defect-free, they should be regarded as an antithesis of agility. The new paradigm however suggests consumers are more concerned with high quality, low cost bespoke products and the Goldman et al (1995:4) definition of agility would appear to be the embodiment of this – 'a comprehensive response to the business challenges of profiting from rapidly changing, continually fragmenting, global markets for high-quality, high performance, customer configured goods and services'. Vokurka and Fliedner (1998: 165) appear more granular in their definition which is 'to produce and market successfully a broad range of low cost, high quality products with short lead times in varying lot sizes, which provide enhanced value to individual customers through customisation' meaning the historic trade-off between cost and quality (Thompson et al (1978)) is largely redundant.

Sherehiy (2008) refers to agility strategy which consists of four dimensions and suggests these are demonstrable sub-sets of agility. There are very clear commonalities between these and the agility characteristics postulated by Goldman et al (1995):

Sherehiy	Goldman et al
Product related agility	Enriching the customer
Cooperation related agility	Cooperation
Organisation related agility	Structure
People and knowledge related agility	People

Table 1 Comparison of the structure of the Sherehiy and Goldman studies

The only significant variation appears to be product related agility which Goldman et al consider too narrow, emphasising that enriching the customer is concerned with

solutions rather than simply product(s). Sherehiy asserts that agility strategy impacts on workforce agility but this is regulated by work organisation with the relationships configured as follows:

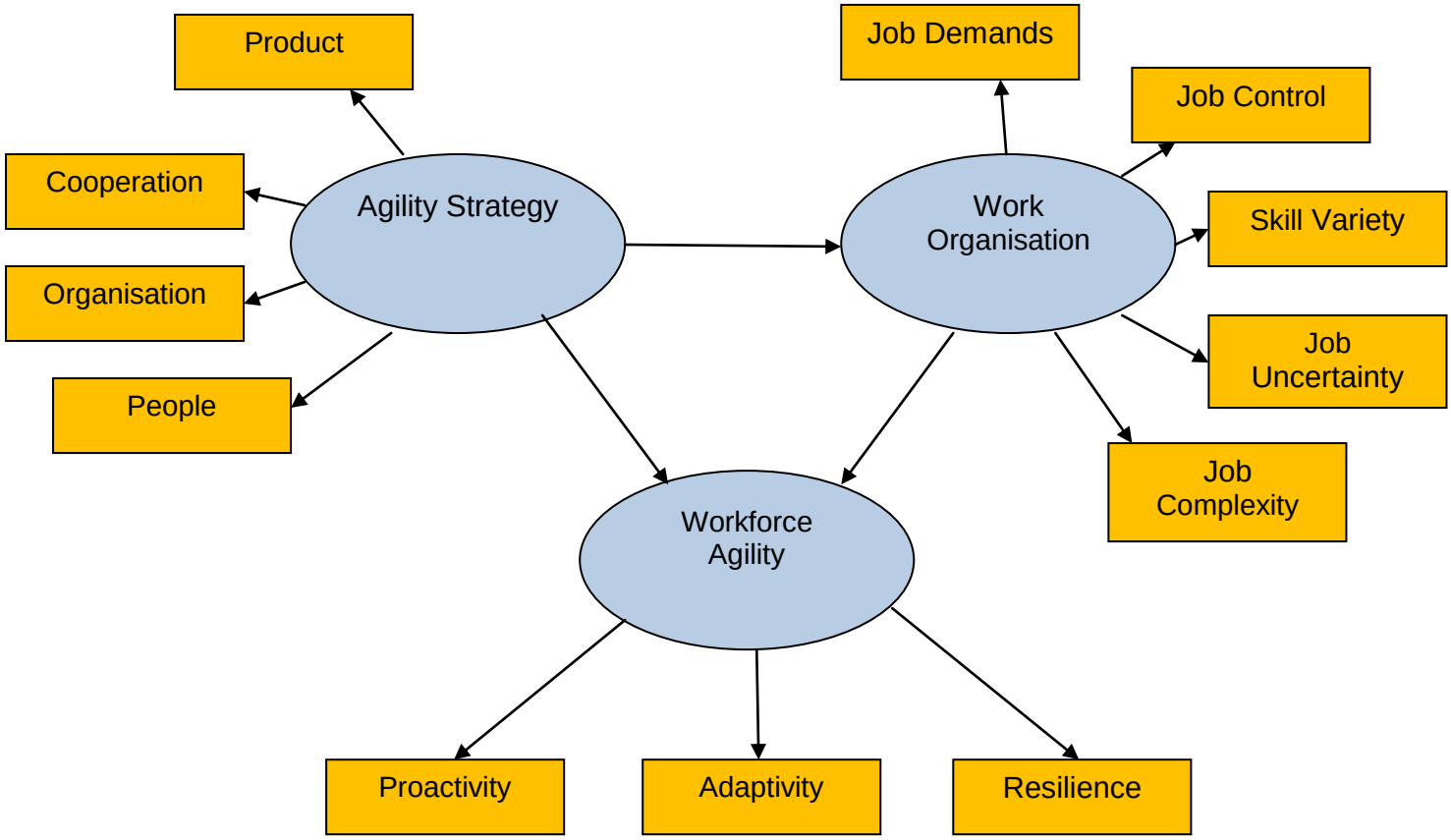


Illustration 1 Human – Work Organisation Model in Agile Enterprise (Sherehiy (2008:95)

Sambamurthy et al (2003) echo this view, regarding agility as the overarching concept which encompasses an organisation's interactions with customers, coordination of internal operations and leveraging its network of business partners. This is distilled to three distinct agility characteristics:

1. Customer agility – is concerns the key role customers play in opportunities for innovation and this manifests itself in three ways – as a source of creativity, as co-creator of design and development and as a test bed for innovation
2. Partnering agility – is the use of alliances and joint ventures to further the opportunities for innovation and competitive actions and this involves the ability to modify the network to secure access to new assets or competence

3. Operational agility – reflects the ability of processes to facilitate innovation at speed whilst delivering cost and quality benefits and allowing the firm to meet the demands of rapidly altering environments

Whilst there are commonalities with Goldman et al, the authors say little about the involvement of people in delivery of agile outcomes. Sambamurthy et al (*ibid*) do however add two extra dimensions – exploration and exploitation, with exploration being experimentation concerned with generation of knowledge about unknown opportunity and exploitation the leverage of known information to refine and extend competencies.

Lampel and Mintzberg (1996) suggest the drive to standardisation is demand driven, with common tastes permitting standard design and ultimately production and distribution. The authors also sound a cautionary note that standardisation and customisation are not in themselves alternative strategies but represent two polarities. The danger for organisations is that substituting standardisation with customisation merely serves to replace one extreme with another. Allee (2009) suggests the drive toward standardisation can have an unexpected consequence of stifling agility. Gunasekaran (1998:1223), despite relating the issue to manufacturing, does encapsulate the change element and the customer focus with a definition being 'the capability to survive and prosper in a competitive environment of continuous and unpredictable change, by reacting quickly and effectively to changing markets, driven by customer designed products and services'. Whilst the work of Goldman et al (1995) and Gunasekaran (1998) in introducing the concept of agility is significant and commonly cited, the practicalities on how to cultivate the necessary capabilities are less clear. Sherehiy (2008) alludes to a study by Yusuf and Adeleye (2002) which reports a high correlation between agile characteristics and performance outputs. This supports the findings of Glenn (2009) who suggests an outperformance when compared to lean companies but Vazquez-Bustelo et al (2007) suggest a dearth of evidence to suggest agility translates into superior business performance.

According to Van Hoek et al (2001), the relevance of agility depends upon the operating environment. Functional products with a predictability of demand benefit from efficiency within the supply chain, very much in keeping with the mass production ethos. Innovative products conversely require supply chains that are responsive and flexible, the implication being that agility carries less relevance for some industries. Shalit and Yaniv (2011) suggest agility has resource implications since organisations need adequate resource to scan and respond to the environment

and paucity in this area will inhibit response capability. The corollary to this is presented by Overby et al (2006) who further suggest agile capability could be a wasted resource in relatively stable environments, a view mirrored by Shalit and Yaniv. This appears to contradict the views of Yaghoubi et al (2011) who posit that an agile organisation can bring about reduced costs. According to Vazquez-Bustelo et al *(*2007*)*, case studies related to organisational agility are in short supply, particularly in Spain where their own research (on manufacturing – see illustration 2) is conducted. Nevertheless, they suggest agility can be distilled into three basic elements:

1. Agility drivers – turbulence in the environment, incorporating continuous and disruptive agents, which acts as a catalyst for change
2. Agility enablers – the means by which change within the organisation is facilitated. Agility is achieved by optimising five basic elements within the firm:
    a. Agile human resources
    b. Agile technologies
    c. Value chain integration
    d. Concurrent engineering
    e. Knowledge management
3. Outcomes – there is a statistical evidence from the study to support the view that agility traits impact positively on manufacturing strength which in turn drives better performance

McCann et al (2009) define turbulence around two key dimensions – the pace of change within the operating environment, along with the level of disruption incurred by the change but the authors are explicit in their view that rapid change can be managed by organisations by building capability to understand product innovations and business cycles within the industry. Yauch (2011:384) suggests agility is the firm's ability to succeed in a turbulent environment and subsequently defines turbulence as an environment 'characterised as one with high levels of uncertainty', though the research is squarely centred on the manufacturing industry and appears in a manufacturing journal. Turbulence has a negative impact on firm competitiveness since it undermines response capability and the ability to recover from adversity but it is not homogenous since the capacity for managing this varies across organisations and sectors. This would appear consistent with the capability to deal with turbulence in the form of agile traits being firm and situation-specific (Dove 2001, Haneberg 2011, Shalit and Yaniv 2011).

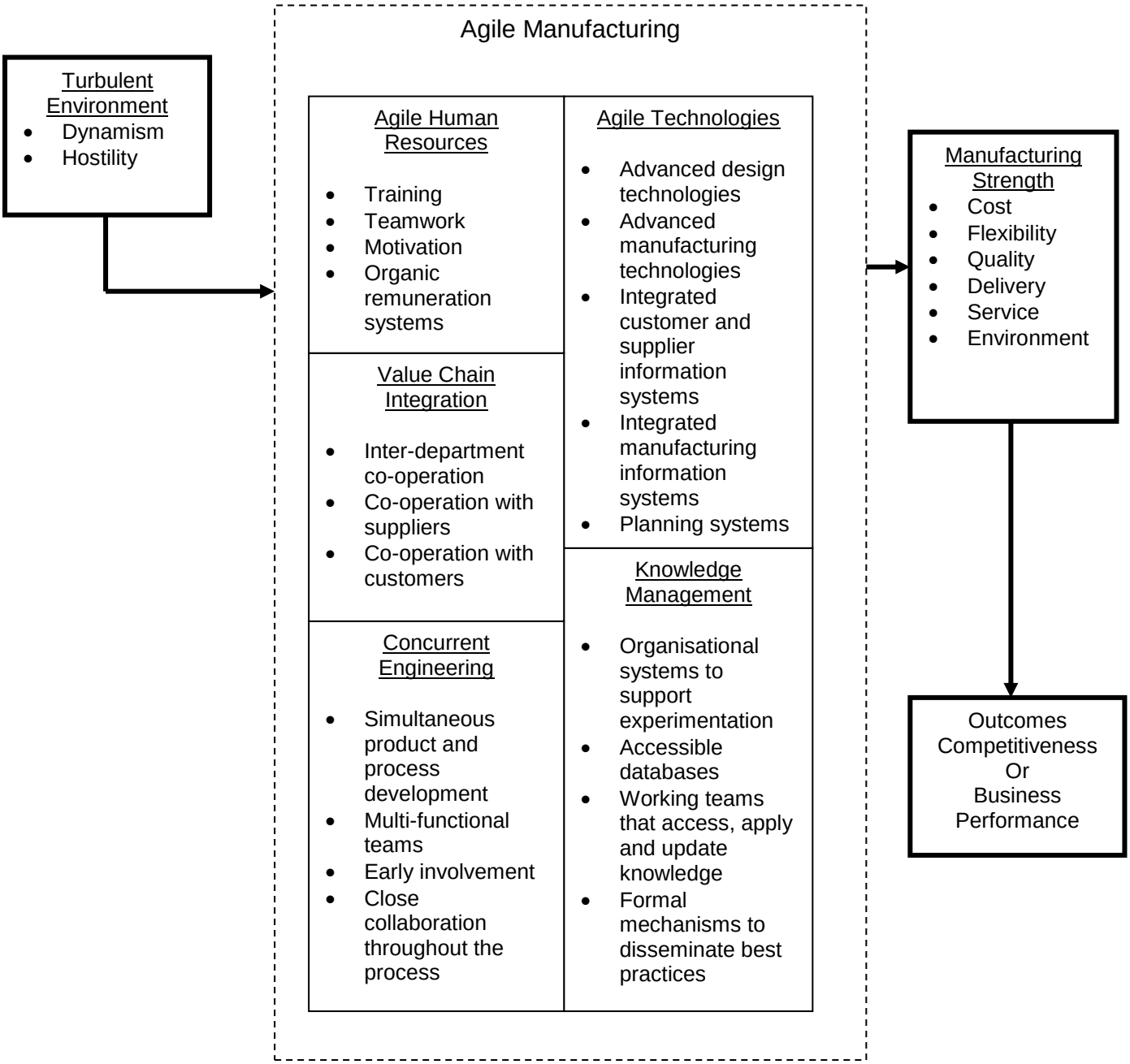


Illustration 2 Agile Manufacturing conceptual; model (Vazquez-Bustelo et al (2007:1313)

Limitations of existing research

A gap exists in the literature to the extent that organisational agility has been considered extensively in manufacturing (Goldman et al) but the relevance to service sectors has not been tested to any great extent and international studies are narrowly focussed (Van Oosterhout et al 2006). Damanpour (1996) suggests there are fundamental differences between manufacturing and service based firms with the latter more varied and more likely to experience simultaneous production and consumption of outputs. This contrasts with manufacturing where there is often a lag between production and consumption. Kay (2012) suggests the importance of manufacturing is engrained in the human psyche but looking at the typical value chain within manufacturing reveals that most is service related (such as design, marketing) and this highlights the importance of this study.

Previous studies of Organisational Agility are either sector specific (Engineering Youssef 1992), internationally focussed (Van Oosterhout et al 2006, Vazquez-Bustelo et al 2007) or a specific element of the value chain (Sarker et al 2009) providing the opportunity to consider agility in a wider context. Fliedner and Vokurka (1997) suggest the changing competitive landscape drives the need for agility, but this carries relevance for manufacturing and service industries and this appears incongruent with the paucity of research into the latter. The research does not explicitly relate to the manufacturing sector though this is the implication since it appears in an industrial journal. Yusuf et al (2003) consider agility from a quantitative perspective, with analysis drawn from a diverse industry base, but this relates only to UK companies, with feedback sought only from chief executives, which creates a potential bias.

Agility would appear to be context specific, according to Vokurka and Fliedner (1998) and this might explain why the authors highlight an absence of measurement for the phenomenon. Yauch (2011) refers to Tsourveloudis and Valavanis (2002) who state that the vagaries and ‘multidimensionality’ of agility naturally make metrics problematical. Erande and Verma (2008) have developed a ‘Comprehensive Agility Measurement Tool’ (CAMT) but, in keeping with previous studies, this is focussed on manufacturing and suggests lean has to be achieved before moving to agility, whereas much literature (Lampel and Mintzberg 1996, Greene et al 2008) suggests the co-existence of lean and agility rather than a transition. In addition, despite citing the importance of Goldman et al (1995), the number of agility traits considered in the model

is limited to ten which appears too narrow. Yauch (2011) does refer to a 'key agility index' which measures the ratio between the time taken to complete isolated tasks within a project and the entire project length. Whilst it is acknowledged this has a limitation in efficacy confined to comparing projects within the same firm or similar sectors, since different sectors experience varying degrees of turbulence, it also overlooks a crucial point that agility represents a far broader concept than simply speeding up processes.

These limitations create a need to redefine the key factors underlying organisational agility, to structure these so some sort of significance can be attached to them and to broaden the output measures to build a rich picture of agility. This can then be used as a basis for a longitudinal study to establish whether particular industries, sectors or types of organisation are more successful in cultivating the benefits of agility than others. Similarly the notion that smaller more embryonic companies are able to outperform their larger, more mature brethren needs to be substantiated. In an international context the study will be developed to examine whether this transcends cultural boundaries.

In the following pages I consider the four pillars of agility (Goldman et al) and aim to examine the literature relevant to each in turn, starting with 'customer' and more specifically the need to develop solutions rather than products which is a key differentiator for the agile firm, according to the authors.

Customer

Solutions not products

Rigby et al (2000) and Goldman et al (1995) agree that the primary objective of the agile organisation should be to enrich the customer experience by offering solutions which satisfy diverse needs. Whereas the old paradigm (Goldman et al (*ibid*)) was very much focussed upon product, adding value now encapsulates product, service, delivery and after-sales. Ettenson et al (2013) regard the importance of solutions sufficiently highly to advocate a reconfiguration of the marketing mix (four Ps) to include a focus on solutions rather than product. Van Hoek et al (2001) regard agility as being concerned with mastering turbulence in the environment, but in addition, it is about being able to shorten customer response times. This echoes the view of Maskell (2001) who believes that agility is a demand-side issue with customers expecting shorter

development and delivery times with greater variety of products (Goldman et al 1995). Moreover Maskell suggests the continual upgrading of product features and delivery of total solutions is equally as important as product in isolation. According to Sambamurthy et al (2003) there is a clear link between strategy and posit that strategic positioning and the efficacy of execution through a system of activities determines firm performance where positioning establishes the uniqueness and value in the proposition, with activities informing the effectiveness of executing and generating economic rents (Kay 2006 p161). Glenn (2009) also identifies three traits of the agile organisation – innovation leadership to improve customer experience, turning knowledge into value and consistency in execution all of which are underpinned by customer centricity.

Goldman et al (1995) are unequivocal in their view that this can only be achieved through co-operation to enhance competitive positioning and cite the use of virtual organisations drawing on the complementary skills of participating organisations to extend beyond the capability of any single entity. This is consistent with the concept of networks highlighted by Johnston (2007), where a group of firms, which may be independent or autonomous subsidiaries, pursue a common goal thus displaying the characteristics of a single organisation, although in reality, networks often rely upon one dominant member to act as a focal point. Martinez-Sanchez et al (2007) also identify this potential failing and assert it should be a collective undertaking of the network not to seek firm-centric improvements at the expense of the network and that collectively agreed goals help to instil a model of unilateral contribution.

Johnston (2007) extends the theme to ‘dynamic networks’ where responsiveness is necessary to meet the demands of rapidly changing or evolving markets, such as fashion. In this instance the role of the dominant firm is exaggerated to that of an ‘integrator’ which identifies and assembles assets owned by other organisations on a ‘best of breed’ basis. Whilst the ambition to be customer-focussed is laudable, Han et al (1998) point out an over reliance on this can belie failings in other aspects of strategy, such as competitor strategies and this serves to make the organisation reactive rather than proactive. The authors do acknowledge that over-emphasis on competitors is similarly undesirable and therefore customer and competitor orientation should be conjoined if competitive advantage is to be realised. MacMillan and McGrath (1997) indicate an organisational propensity to focus on product or service but this means opportunities to differentiate at various customer touch-points are missed. The authors introduce the notion of the ‘consumption chain’ as a way for organisations to establish less conventional ways to differentiate themselves. Kotter (2008) suggests successful

organisations are those which cultivate feedback from workers closest to the customer, employees which collect customer and competitor data as part of their day-to-day activity. Van Hoek (2000) refers to postponement in relation to fulfilling customer orders. Although the concept has been in existence since the 1960s, there is growing evidence of its use in the modern enterprise. Postponement is where organisations defer supply chain activity until receipt of orders rather than in advance, this being conducive to agility in the following ways:

- Allows customisation of orders
- Sharing of customer information along the supply chain
- Supports integration of functional activity aligned to customer

Damanpour (1996) identifies several differences between manufacturing and service firms, the foremost being the fact that manufacturing often experiences a lag between production and subsequent consumption. This is less evident in service based firms which experience simultaneous production and consumption. From a customer perspective, the author also identifies a key differentiator with production and the customer being more remote in manufacturing. This contrasts with service companies where the customer is more integrated in the delivery of output and this means workers in service organisations generally need greater autonomy than their manufacturing counterparts. Firms should meet this challenge through structure such that manufacturing firms seek vertical structure and seek economies of scale but service firms are typically disaggregated into smaller units and positioned closer to customers.

Based upon the outputs of the interviews, innovation is seen as a key component of what defines an agile organisation, so the next section examines the literature relating to this.

Design and innovation

The Oxford English Dictionary (1990) defines innovation as:

To bring in new methods/ ideas, to make changes

Cepeda-Carrion et al (2012) suggest innovation is increasingly becoming acknowledged as a primary component in assuring a firm's long-term success given the competitive nature of the business environment, supporting the view of CIPD

(2011) on sustainability. In a rapidly changing environment, innovation is sustained by an ability to regenerate its knowledge base. The authors identify a linkage to agility to the extent that organisations with innovation capability will be more adept at responding rapidly to changes in the environment than their non-innovative counterparts. Tether (2005) uses the 1996 Eurostat Report produced by the Office for Economic Co-operation and Development (OECD) to illustrate the difficulty in measuring innovation but he does make a significant distinction between innovation within manufacturing and service based industries and posits that understanding in relation to innovation, in common with agility, has tended to be grounded upon manufacturing industry. Tether (*ibid*) also identifies this phenomenon but uses it to highlight the disparate change patterns prevalent in the manufacturing and service arenas, with the latter more usually attuned to continuous change. The difference is exaggerated because service outputs lack tangibility and as a consequence innovations tend to lack visibility and are hard to quantify. Manufacturing tends to be characterised by the 'innovation staircase' which is in keeping with the punctuated equilibrium model advanced by Romanelli and Tushman (1994) whereby periods of stability are interrupted by step-change innovation. This contrasts with services where a set of activities, which individually might be subtle but collectively serve as innovation, although in the case of services, because they are often process driven, ascribing innovation to 'product innovation' or 'process innovation' (or both) is often ambiguous. Damanpour (1996) relates the findings of Romanelli and Tushman to innovation to the extent that transformational innovation is consistent with period of discontinuous change which contrasts with incremental innovation, associated with periods of adaptation.

There are two issues here which suggest the innovation element of agility is transposable from manufacturing to services, the first being activities which bring about innovation can vary between customers, referred to by Tether as 'performances' but this has commonality with mass customisation, a key dimension of agility, according to Goldman et al (1995). The second is the mix of activity can bring about different outcomes with each 'performance' and this makes imitation more challenging for competitors and mirrors the theory of causal ambiguity advanced by Reed and DeFillippi (1990). In a corollary to this, Tether asserts that innovation within services is often based upon technology which is equally available to competitors, leading to convergence and ultimately competitive positioning based upon price. Whilst Tether's research is highly relevant to the agility discussion, it is predicated on organisations within the European Union and significantly does not

consider the US and in addition was a targeted at one top-level executive in each organisation only. The research does however identify that more than half of manufacturers focus their innovation efforts on production process in contrast to less than a quarter of service companies, but these ratios are reversed for innovation efforts channelled into organisation changes with more than one third of service firms confirming this as their only innovation effort.

Sambamurthy et al (2003) position innovation as the arbiter for the high performing organisation since competitive advantage built upon positioning alone is undermined by market disruption, which allows rivals or new entrants to build superior market knowledge to usurp existing incumbents. This creates the need for firms to continuously innovate product, services or channels to maintain competitive advantage. Drucker (1980) considers innovation in relation to rapidly changing environments and acknowledges innovation carries risk, but points to organisations such as Procter & Gamble and 3M where success is built upon innovation and who measure innovation efforts against expectations. They also use feedback mechanisms to gauge success, mirroring the view of Ohmae (1988). According to Dove (2001) innovation is characterised by new knowledge being used to effect change, a theme continued by Khalifa et al (2008) who suggest innovation is often defined as a knowledge-based capability which incorporates three phases – discovery, experimentation and development in relation to new products, services, technologies or structures. The rationale for the link between innovativeness and performance is grounded upon innovation addressing uncertainties present in the firm's operating environment. Damanpour (1996) agrees that innovation consists of three phases (generation, development and implementation) but contextually this can be seen at industry, firm or individual level and is concerned with the introduction of new products or services to meet a need within an external market. Moreover, innovation can be seen as a response to changes in the external environment or pre-emptive actions that can shape or influence the landscape, this being along two dimensions.

Radical innovation delivers fundamental change, representing a marked departure from existing operations which means perhaps not surprisingly, it is less frequently used. This contrasts with incremental innovation which results in more measured departure. Han et al (1998) suggest marketing literature relates innovation to product related developments and this explains why firms' efforts are often product centric. Eisenhardt et al (1995) agree and highlight that many organisations regard product

innovation as the primary response to changes in the external environment. Although the research is restricted to the computer industry, which was specifically chosen due to the rapid change cycles associated with that sector, this does still hold relevance since the ability to adapt at speed has become pivotal in product innovation, which is consistent with the views of Hallgren and Olhager (2008) and Cole (2010). Han et al however suggest a market orientation strategy should be predicated not solely upon product but administration, meaning innovation needs to be regarded though a broader lens. This is substantiated in the author's research into the banking sector, which is service based and where administrative innovation assumes greater importance than in manufacturing. This poses an interesting parallel with organisational agility and raises the question of whether the relative importance of agility facets could be markedly different within service firms. Carneiro (2000) considers the influence of the environment with the notion that, even when innovation is not possible, an improved knowledge of the environment and competitive landscape can provide a platform for competitive moves.

Damanpour (1996) suggests innovation is complex and theories predicated on limited variables lack predictive quality. The author illustrates two major relationships – the association of innovation with structural complexity and that of organisational size (Bennis and O'Toole 1993). Damanpour offers complexity as a positive influence on innovativeness since complex (and large) organisations contain a diversity of specialist skills which can be leveraged for generating new ideas. Moreover there appears to be a direct linkage between complexity and innovation within the organisation and the external environment to the extent that under conditions of stability, organisations need to be neither complex nor innovative. Conversely, as environmental uncertainty accelerates, corresponding increases in complexity and innovativeness are necessary. This would appear to be consistent with the views of Gonin et al (2011) who regard innovation as particularly pertinent in times of crisis, with innovation being product or service related.

Sambamurthy et al (2003) regard innovation as being influenced by two characteristics – the number of competitive actions and the complexity of 'action repertoire'. Whilst the number of actions can include new product, service, channel or segmentation, complexity is concerned with the variety and sophistication of the competitive actions. This ranges from firms which follow thematic patterns (e.g. repeated new products) known as repertoire simplicity to a broad variety of actions, representing repertoire complexity. This complexity exaggerates the disruptive nature

of the action and elongates the competitive 'window' for the initiating firm before competitors can fabricate a response. Damanpour refers to research by Duncan (1976) which refers to 'ambidextrous' models of innovation such that complex firms initiate innovation whilst low complexity allows implementation. This can be remedied in large firms with the adoption of flexible structures and subdivision into smaller units. Damanpour does balance this argument by pointing out large firms built around rigid management structures lead not only to inertia and a natural aversion to innovation, but importantly, a lack of flexibility to meet unpredictability at customer level. It is argued that the same complexity which facilitates creativity acts as a barrier to implementation because typically large firms often struggle for consensus. Han et al (1998) consider initiation and implementation in relation to a timeframe, and drawing on research within the banking sector, conclude that service firms display more agile characteristics than their manufacturing counterparts with implementation and this has an important parallel with the concept to cash principle advocated by Goldman et al (1995). It should be noted however the research is predicated on a single service sector, (banking) where it was felt monetary considerations drive rapid implementation, therefore this cannot be generalised to the wider service sector. The authors do however refer to analysis by Gupta et al (1986) and Weiss and Heide (1993) to conclude innovation as an effective means of overcoming the demands of environmental turbulence.

Christensen and Overdorf (2000) also regard innovation as a two-fold concept, the first being sustaining innovation, which tends to be evolutionary and relates to ways in which organisations improve existing products. The second is disruptive innovation which involves the creation of a new market due to the development of a radically new product or service. Sustaining innovation, typically product extensions or enhancements to existing technologies, tends to be dominated by existing industry leaders, who often demonstrate difficulty in embracing disruptive or radically new innovation. This is fully consistent with the views of Von Hippel et al (1999) who highlight a managerial desire for transformational innovation, for example setting goals demanding a certain percentage of sales be derived from new products, but the reality invariably lies with incremental enhancement to existing products and services. This is because ground-breaking innovation incurs cost and time, whereas organisations compete, and top management is rewarded, based upon short term criteria (Govindarajan and Trimble 2011, Kirby 2010). Whilst the findings represent accumulated knowledge and thus are valid, contextually they are grounded only on the experiences within one organisation (3M). Vesey (1991) identifies pervasive

change, driven by ambition to develop new products or extended product lines, which can only be achieved by substituting sequential with simultaneous activities, referred to by Goldman et al as concurrency. Roper et al (2010) disagrees, suggesting pursuit of innovation on multiple fronts is a recipe for mediocrity and this inevitably leads to trade-offs (Porter 1996). This echoes the views of Miller (1986) who highlights the potential for resource depletion by being over-ambitious and pursuing too many innovation developments simultaneously. Kay (1993) argues that despite innovation being a more obvious source of capability it is generally one that is not sustainable as innovation attracts imitation. Innovation is best supported by another distinctive capability such as architecture or reputation. Kay (ibid) highlights that companies that exhibit high degrees of innovation, have an architecture that facilitates a continuum of innovation. Kanter (1999) disagrees, suggesting firms that innovate build a deep understanding of new markets and that perennial innovators build a reputation for problem-solving and are thus able to secure the advantages of 'first-mover' status. This, Kanter argues, is why innovators typically spend heavily on research and development to bring solutions to unmet needs or problems.

Khalifa et al (2008) ascribe innovation to two dimensions with administrative innovation driving efficiencies and technical improving competitiveness. Damanpour (1996) regards process type innovations as less obvious and with a perception of being less transformational as these are related to delivery of outcomes rather than outcomes per se. This appears incongruous with the effort needed in implementation – process innovations are generally more problematical as efficacy is contingent upon more wide ranging alterations to structure for example. The author also refers to research by Daft (1992) which suggests product or technical innovations tend to be 'industry specific' and thus benchmarked against industry leaders, leading to imitation and convergence whereas process or administrative innovations are more difficult to imitate and therefore organisation specific, mirroring the concept of causal ambiguity (Reed and DeFillippi ibid). Eisenhardt et al (1995) refer to product design through 'prototyping' where multiple iterations of design not only improve the chances of success but in addition allow the organisation to shift more efficiently on receipt of new information and avoid the risk of workers becoming too attached to one design concept.

Hargadon and Sutton (2000) suggest the importance of innovation lies in its relationship with organisational learning, to the extent that lack of innovative capability hampers learning and the ability to evaluate new ideas. In addition the

notion that innovation is driven by a few key individuals is fatuous but instead has internal and external influences. O'Connor et al (2009) highlight the issue that whilst many organisations are innovative, this is achieved despite mismanaging innovation talent, a consequence of seconding high potential staff onto 'projects' but without any form of continuity. Hargadon and Sutton continue that large organisations traditionally lack the control processes that allow individuals and teams to have visibility around innovation efforts in other parts of the company. Roper et al (2010) agrees that whilst innovative capability is contingent upon internal capabilities, there is also a requirement to develop external knowledge through innovation systems and networks, thus reflecting the views of Johnston (2007).

Within the interviews, there was a strong emphasis on innovation but this was closely associated with being a 'first mover'. Whilst the design of the measurement tool initially treated the two issues in unison, this was later reversed, with innovation measured separately. In the following paragraphs I consider the literature associated with frst mover status.

First-mover

Zhang and Sharifi (2001) suggest agility is about responding to changing customer requirements but is also inextricably linked with a drive to seek out new markets and this reinforces the views of Vokurka and Fliedner (1998). Christopher et al (2004) refer to 'quick response' or 'QR' which is particularly pertinent to fast-paced industries and involves delivering a diverse range of quality products and the desired quantities, to meet real-time demand, completely aligning with the views of Goldman et al (1995). The authors conclude that QR differs from traditional supply-chain dynamics because stocks are replenished based upon real-time information (rather than forecasts) and this helps to mitigate the effects of excess inventory and eventual price mark-downs. Kay (1993) however sounds a more cautious note by suggesting that poineering, whist a prominent capability, is less sustainable since innovation attracts imitation and this often means poineers fail to appropriate benefits. Hormozi (2001) considers first mover advantage in relation to national performance, to the extent that countries shown to embrace new paradigms early tend to build competitive advantage and highlights the tardiness of the US and Europe in adopting lean, which led to erosion of market share. Suarez and Lanzolla (2005) suggest a common misconception within the business community that early entry to a market is seen as providing a 'head-start' but the authors point out that pioneers are just as

likely to fail as succeed. Two factors are seen as important determinants of whether 'first-mover' proves advantageous:

- Rate of technological advancement in the product category
- The rate of expansion of the market segment

Hamel and Prahalad (1994) suggest organisations are too often viewed as a collection of business units and use the example of Canon (p90) to illustrate that innovation can be confined to existing business know-how (in Canon's case, photocopiers, cameras, printers). Operating in this 'silo' mentality, creates a myopia which means opportunities to gain a foothold in previously unserved segments is lost.

Both innovation and first mover are linked to agility through the ability to sense impending change in the environment meaning access to and processing of information are vital and this is considered in the following paragraphs.

Information (assimilation)

Eisenhardt (1989) in a study related to the IT industry considers the ability to react quickly in conjunction with use of real-time information. The research considers a narrow sample of only eight microprocessor companies and in addition, it predates most of the earliest literature on agility (Iaccoca Institute 1991) but some key elements would appear to hold relevance for organisational agility. One of the significant conclusions drawn from the research is that the use of real time information, particularly relating to the competitive environment is directly proportional to the ability to reach strategic decisions quickly. The author draws on research conducted by Hayes (1981) and Simon (1987) which suggests executive intuition is developed through continuous exposure to real-time information. Kidd (1994) supports the view of Ashby (1956) in considering the use of control mechanisms in responding to environmental changes, suggesting the variety of responses must be at least equal to the environmental variety to which it is exposed. Eisenhardt (*ibid*) concludes that the ability to make strategic decisions at speed improves organisational performance in high-velocity markets. The second significant finding is that management confronted by more strategic alternatives demonstrate a greater propensity to make faster decisions. This would appear to be counter-intuitive but management teams with fewer alternatives tend to evaluate them sequentially rather than concurrently.

Schoemaker and Day (2009) suggest fewer than 20% of global companies have capacity to interpret and respond to early signals of impending change. This is due to individual biases which manifest themselves by managers reshaping information to fit their preconceived view, this being particularly prevalent with contradictory or incomplete information. This is referred to as selective perception where signals individuals notice is determined by what they might expect to see and information which is inconsistent with engrained mental models becomes distorted, rather than individuals challenging their own value-base. This is consistent with the views of Seymour and McCabe (2007) in relation to acceptance of 'stories about' carrying resonance with past experiences.

Scanning for weak signals	Sense-making	Probing and acting
Actively surface weak signals	**Amplify interesting weak signals**	**Probe further and clarify**
Tap local intelligence	Test multiple hypotheses	Confront reality
Leverage extended networks	Canvass the wisdom of the crowd	Encourage constructive conflict
Mobilise search parties	Develop diverse scenarios	Trust seasoned intuition

Table 2 Finding a Purpose of Sense (Schoemaker and Day 2009:84)

Schoemaker and Day (2009) also identify organisational biases, in the form of 'groupthink' which similarly impede sensing capability, whereby an organisation places increased credence upon consensus rather than individual assessment. Overcoming these biases enables an organisation to better interpret early (or weak) change signals and a model for attaining this is shown in table 2.

The use of up to date and real-time information is also necessary to provide customised solutions, a theme emerging from the interviews, but mass customisation was also considered pivotal to the agile organisation and literature related to this is examined in the next section.

Mass customisation

Sherehiy (2008) supports the views of Sanchez and Nagi (2001) that lean is a collection of operational techniques focussed on productive use of resources and reflects the view

of Hormozi (2001) that lean is so called as it utilises less of all production factors. This contrasts with agility which is more strategic in nature. Mason-Jones et al (2000) suggest that whilst agility is using knowledge and cooperating to benefit from volatility, lean aims to eliminate waste as a platform for 'a level schedule'. Krishnamurthy and Yauch (2007) identify one failing of lean lies in its rigidity which mirrors the view of Kidd (1994) who suggests lean is a short term measure associated with closing a competitive gap. This contrasts with agility which deals with uncontrollable events and very much aligned with unpredictability (Van Oosterhout et al 2006). Vazquez-Bustelo et al (2007) agree that lean is more associated with stable environments, with agility more appropriate for turbulence. They also differentiate lean which tends to be tactical in nature and thus used in isolation, with agility being a more holistic concept. This is quantified by Meredith and Francis (2000:137) who highlight six attributes characterising an agile organisation, although the focus of the study is on the manufacturing industry:

1. Produces to order
2. Meets customer needs
3. Achieves speed and flexibility
4. Manages knowledge to support agile strategy
5. Receptive to new operating practices
6. Utilises alliances and virtual structures to enhance capability

Greene et al (2008) suggest the elimination of waste helps to reduce delivery time to customers, fulfilling the requirement for speed but this is agnostic of the competitiveness within the industry. Christopher and Towill (2000) acknowledge quality, service and lead-time as important functions of lean but the decisive factor for the lean enterprise is cost. This is considered in relation to agile, where cost is a function but competitive advantage is predicated upon service. Agility is negatively associated with cost leadership (Hormozi 2001) to the extent that organisations pursuing this strategy will proactively avoid agile characteristics. Agile organisations are therefore driven by competitive intensity and differentiation strategies, a view shared by Glenn (2009) who identifies CEOs regarding agility as a differentiator.

Vazquez-Bustelo et al (2007) assert that lean organisations primarily focus on efficiency and subordinate responsiveness. This contrasts with agile firms, which place an equal importance on the two. However, the extensive use of lean in the car industry (Womack et al 1990) is in direct response to seeking competitive advantage,

meaning the notion of a compromise between lean and competitive clarity is flawed. Hallgren and Olhager (2008) contrast this with agility which is concerned with using insight to benefit from volatile markets. This enables organisations to configure operations to allow development of new, customised products in an efficient manner, fully consistent with the 'time to market' concept (Goldman et al) and equips organisations to withstand an intense competitive environment.

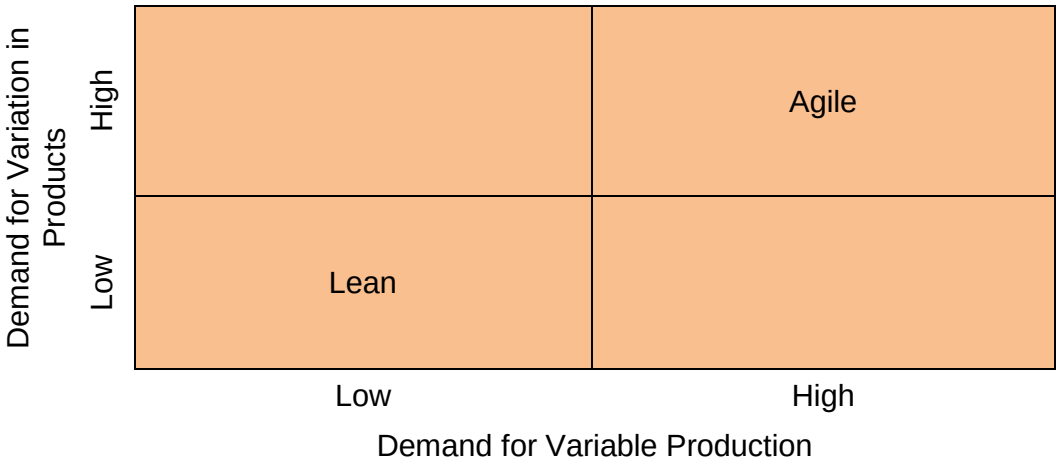


Table 3 Lean and Agile Relationship based on Demand (Greene et al 2008:219)

Proponents of 'leagility' suggest lean and agility can co-exist within the same industry or value chain (Krishnamurthy and Yauch 2007). Greene et al (2008) argue they should be combined where lean characteristics are used upstream and agility downstream, nearer to the customer (Mason-Jones et al 2000, Bruce et al 2004, Greene et al *ibid*). An example of this would be Dell, where the customer facing representative assists at point of sale with a customised specification. Each computer is then custom-built, using parts-inventory, tested and dispatched, usually within five days. This concurs with the view of the CIPD (2011) who regards employees as the 'early warning system' for identifying early change signals within the customer base along with any opportunities and threats. Given that agility is measured by responsiveness and service levels and lean by cost benefit, a symbiotic relationship could ultimately serve to conflate the competitive strategy.

Krishnamurthy and Yauch (2007) highlight research by Katayama and Bennett (1999) around adaptability, which is the ability to adapt to demand by adjusting the cost structure. Given there is commonality between lean, adaptability and agility, the authors view these as 'mutually supporting concepts'. The Krishnamurthy and Yauch research is focussed on the value chain and is limited to just one case study but in

common with Greene et al (2008) considers lean and agile manufacturers in the same value chain, separated by a 'decoupling point'. The importance of this lies in identifying inventory, with lean producers typically carrying some pre-made stock whilst agile producers are able to produce to variations in demand. One important element is that the decoupling point is moveable (Mason-Jones et al 2000). For example changes in the external environment might lead to an increased variety of products which would effectively shift the decoupling point upstream making the supply chain more agile. Conversely a more stable external environment with reduced product mix would have the opposite effect, making the chain more lean. Christopher and Towill (2000) continue this theme by suggesting a shift in the decoupling point upstream (making the supply chain more agile) requires generic inventory formed of components or semi-assembled platform goods. Conversely a downstream decoupling point (lean supply chain) necessitates inventory of finished product though this would appear to subvert the basic premise of mass customisation.

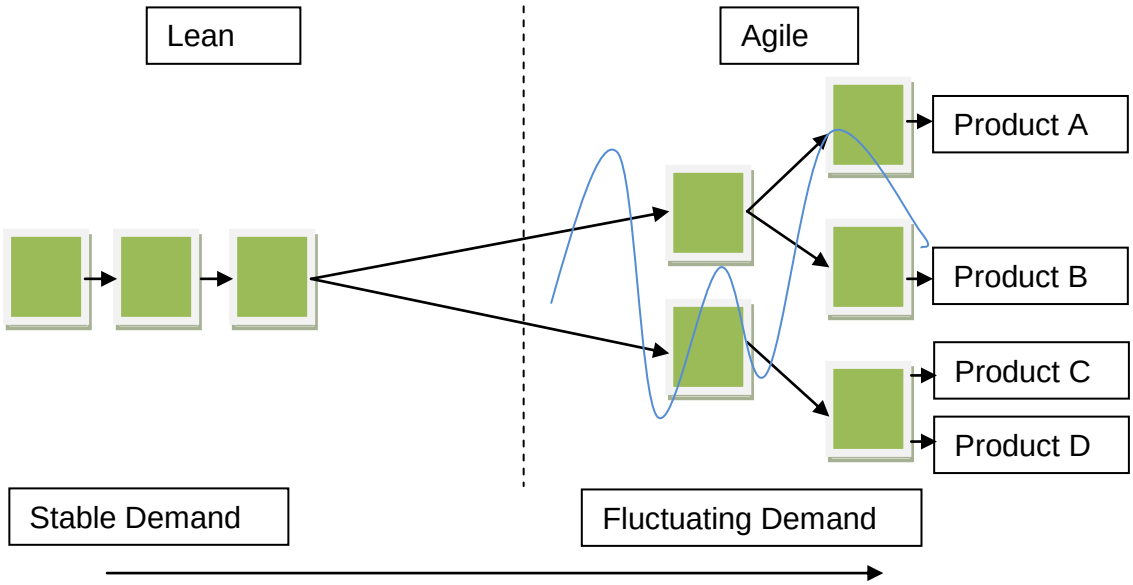


Illustration 3 Lean and Agile decoupling (Greene et al 2008:219)

A leagile supply chain, with a correctly positioned decoupling point, will optimise profits on the basis that lean eliminates waste (and therefore cost) in upstream activity, whilst agility focuses on meeting customer need, thus maximising revenue. Lampel and Mintzberg (1996) suggestion that standardisation and customisation represent polarities gives rise to the notion that firms configure their value chains based upon the nature of customer need. Thus they choose to customise part of the value chain, with the

remainder standardised. Given that customisation incurs a cost, the authors advocate prioritisation in customising downstream functions before working back through the value chain with lean processes upstream of the decoupling point.

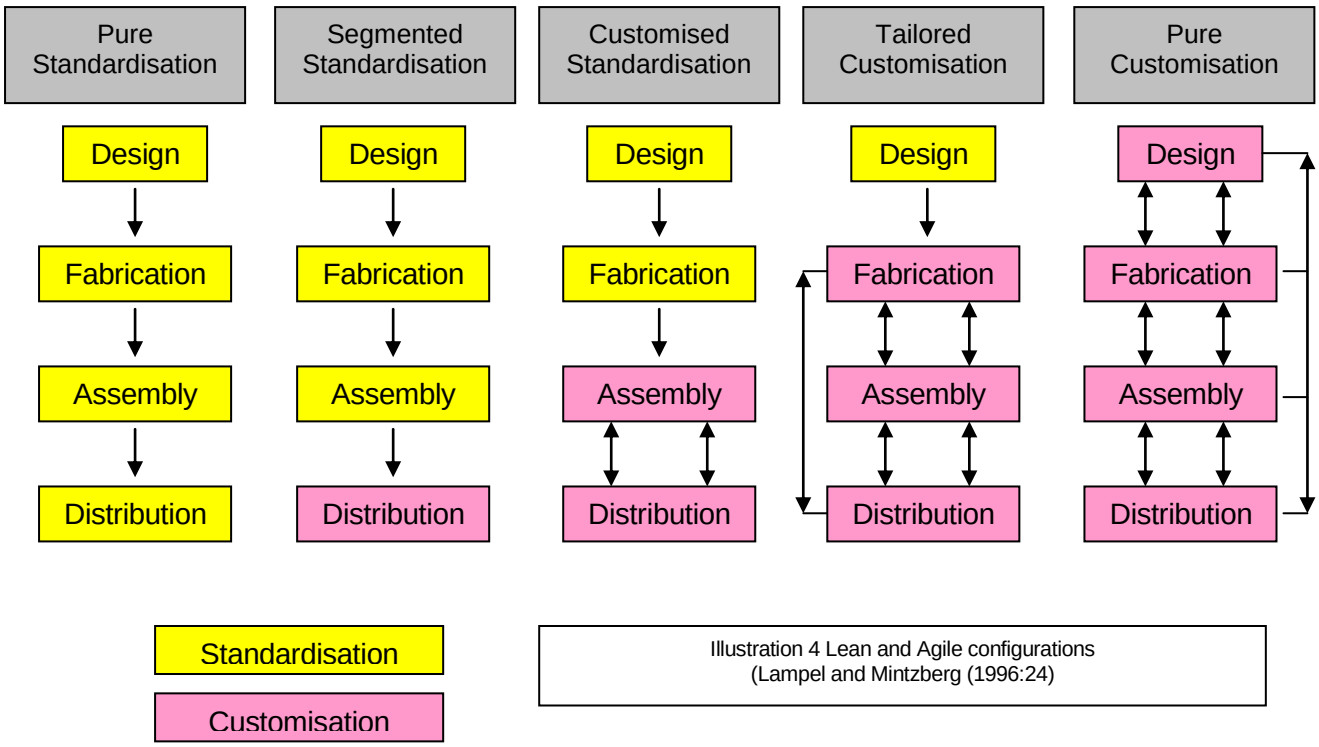


Illustration 4 Lean and Agile configurations
(Lampel and Mintzberg (1996:24)

Compression of elements of the value chain which are standardised and those which allow customisation leads onto an important collective component of the agile organisation and that is the way in which structure supports agile characteristics.

Structure

Configurational theory

According to Kidd (1994:135) one of the issues with the design of agile manufacturing is the lack of clarity around theoretical framework but this is qualified (p188) with the assertion that enterprise design is a key consideration for organisations with agile ambitions. Miller (1987) suggests configurations are clusters of characteristics relating to a firm's strategy, structure or processes. He highlights that a number of forces, known as imperatives, which determine configurations and in particular focuses on four imperatives – Environment, Structure, Leadership and Strategy. Each plays a part in shaping the configuration (the effect) and there does

appear to be some commonality with the four agile traits established by Goldman et al. Miller (1996) compares the impact of configuration with the resource based view (RBV) of the firm in achieving competitive advantage. He suggests RBV considers only elements of strategy which is in contrast to quantifying successful configurations which might encompass a more holistic view of strategy, culture, systems and structure. He continues that competitive advantage as defined by RBV, based upon distinctive capability, can be replicated or purchased by others but is instead derived from 'integrative mechanisms' and their associated complementarity. This raises the issue on complexity and would appear to be reflective of 'causal ambiguity' as a source of competitive advantage posited by Reed and DeFillippi (1990).

The environmental imperative asserts that the competitive landscape (external influence) imposes constraints around the viability of certain structures and strategic options. Miller (1987) draws on research conducted within the electronics industry by Burns and Stalker (1961) to illustrate firm structure is configured to aid innovation as this is necessary for survival in rapidly changing markets, this being consistent with the views of Cole (2010). The author warns the potential downside of this approach is 'industry conformity' where an ability to scan the environment is translated into convergence with competitors, an issue highlighted by Porter (1996). Eisenhardt et al (1995) describe how organisations facing stable environments are best suited to hierarchical structures, with those operating in highly uncertain conditions, needing to be more flexible and adaptive. Miller and Friesen (1984) suggest agility in relation to size may be transitory in nature and governed by configurational theory to the extent that as large bureaucratic organisations become more responsive to the environment, the embedded structure will have a restraining influence and lead to more pedestrian rates of transition than would be the case under just the environmental imperative. Miller (1987) also points to the salience of the environmental imperative relative to firm size (Bennis and O'Toole 1993) with small firms holding limited resources in competitive settings, highly exposed to changes in the landscape, reducing product differentiation. This contrasts with resource-endowed firms in dominant positions less influenced. Damanpour (1996) however suggests that whilst large firms might have greater control over the environment, they lack flexibility and responsiveness.

The structural imperative suggests that whilst hierarchical and formal structures confer advantages in the form of efficiency and control, structural rigidity can stifle innovation and consign the organisation to predictability. This will often be witnessed

in monopolistic industries or where firms possess adequate resources to insulate them from externalities but rigidities of structure can be exposed if performance starts to decline and the firm is forced towards an another alternative, mirroring punctuated equilibrium (Romanelli and Tushman 1994). Miller (1987) suggests other configurations where structure is a central theme and here flexible, collegiate working is evident, with power evenly distributed across an autonomous workforce and this is entirely consistent with the decentralised and delayered organisation advocated by Goldman et al (1995) and adhocracies (Mintzberg in Grant 1991). Shalit and Yaniv (2011) however point to one consequence of delayering within organisations being the number of direct reports showing a tendency to increase as managerial layers are removed but the authors assert this is a necessary enabler if agile ambitions are to be realised, also reinforcing the views of Goldman et al. Kotter (2012) however in a later study suggests delayering has limitations, because fewer layers, less bureaucracy and more autonomy will still not support rapid change since the simplified structure will still be risk-averse and change resistant. Kotter suggests a dual operating system where the traditional hierarchy remains the gatekeeper of more gradual change with more dynamic strategic work the province of networks. The problem with Kotter's view is the assumption the two can run independently of each other but in reality there would be inter-dependencies and this would be dysfunctional.

The leadership imperative considers the influence the CEO can have upon the organisation with forces such as behaviour, talent, emotion and drive having a defined impact on configuration, though here too there is salience to the size of the organisation, with influence greatest in smaller firms or where decision is centralised. In stable environments, CEO influence may be viable if there is a close linkage between CEO and decision makers, but this can become dysfunctional when changes to the environment exert the need for delegation. Dove (2001) however argues that core competence in leadership becomes redundant in environments of seismic change.

The final imperative is strategic, which suggests the organisation must, over the long run, select it's environment based upon resources and competencies and this has direct relevance to configuration since functionally based firms might struggle to assimilate diversification, this being better served by a divisional structure with formal controls. Moreover the competitive strategy will inform structure since innovation and customer focus can lead organisations into new competitive space whereas cost

leaders will seek out stable markets where they can leverage a centralised and bureaucratic structure, and extract value from markets where customers demand homogeneity. Eisenhardt et al (1995) challenge this by suggesting strategic decision makers place reduced importance on planning when the environment lacks predictability. Miller (1987) concludes that although one imperative may prevail and ultimately shape structure, some will be influenced by several imperatives, particularly firms in transition. For example an embryonic firm, dominated by the founder will be shaped by the leadership imperative but may be more influenced by the environmental imperative as it matures which in turn becomes more structural as growth stagnates. Miller qualifies this by suggesting organisations do change whilst within an imperative, but gravitate closer to that norm, for example adaptive firms strive to become more adaptive and this would appear to be consistent with the notion of rigidities proposed by Leonard-Barton (1992). Whilst the work of Miller (1987) predates the earliest work on agility, there appear to be clear parallels (environmental influence, structure) and raises the issue of whether agile organisations ultimately become more agile.

McCarthy and Tsinopoulos (2003) suggest manufacturing systems are complex adaptive systems (Palmberg 2009) and that configurations evolve to support the prevailing environment, for example with mass production, the use of lean. Thus the driving forces for organisational change such as competition and innovation, serve to shape varying configurations. This has commonality with the views of Goldman et al (1995) because since the industrial revolution, configurations have reflected the aims of the mass production era, for example automation and standardisation. This has been superseded by the agile manufacturing configuration which is needed to support the demand for variety and this is analogous with there being no universal formula for agility, and helps to support the views of Sarker et al (2009) in relation to the heterogeneity of agile facets.

Configurational theory holds that organisations are complex yet the machinations cannot be understood by decomposing the structure since each unit is in itself a complex structure which operates independently of central governance. This means understanding of any one unit holds limited ecological validity (Gill and Johnson 1997:128) since findings cannot be extrapolated to the entire enterprise. Lim et al (2006), posit that in reality only a few credible configurations exist since the environment is highly effective at eliminating strategies lacking viability or sustainability and firms are naturally attracted to configurations known to be effective.

Moreover, since change occurs incrementally or in radical phases, many hybrid configurations are not deployed, meaning those used represent only a fraction of the possible permutations the complexity of the environment permits. Miller (1986) further suggests that viable configurations tend to be established rapidly in pronounced fashion but thereafter remain stable for longer periods, fully mirroring the concept of punctuated equilibrium proposed by Romanelli and Tushman (1994) and this calls into question the relevance of configurational theory in relation to agility given shorter life cycles and the disruptive nature of change. Given the diversity within the debate of whether configuration determines the ability for a firm to be agile, it seems a logical step to take a closer look at the way in which the hierarchy of the organisation influences this.

Control and hierarchy

Shalit and Yaniv (2011) refer to research by Burns et al (1990) which suggests traditional hierarchies were formed as a platform for senior executives to elicit power, with Bolden (2011) being more pointed in his view that the leader-centric approach which has been so prevalent is 'no longer fit for purpose'. This would appear to echo the views of Thorpe et al (2011) who, in relation to distributed leadership, suggest the past 50 years has seen a preoccupation with hierarchical models of leadership, where knowledge is cascaded down from the apex of the organisation. Blenko et al (2010) raise the issue of organisational structure and the preoccupation of top management with linking this with financial performance. The authors point out that almost half of CEOs instigate restructure within two years of being appointed but also use a study by Bains and Co carried out between 2000-2006, to highlight that fewer than one third contribute any meaningful improvement in performance.

Trompenaars and Hampden-Turner (1997) highlight how contingency theory links structure with the level of environmental turbulence, showing that hierarchical structures can survive in stable conditions but as the environment becomes more unpredictable, flatter structure becomes more profitable. The authors dispute this, citing the survival of Japanese corporations with steep hierarchies but this belies the poor performance of Japanese corporations since the 1990s (Black and Morrison 2010). Kidd (1994) contradicts the view of Trompenaars and Hampden-Turner, asserting that the traditional organisational structure configured around function and hierarchy will not support the agile enterprise and as such organisations need to form around networks. Thorpe et al (2011) support this view, suggesting the rapid pace of

change, both operational and technological, produces a requirement for expeditious response capability and this has heralded organisational forms which are flatter, built around networks and have exposed the traditional hierarchies as cumbersome. Shalit and Yaniv (2011) additionally refer to Huber et al (1990) who suggest turbulent environments put pressure on firms to change rapidly, with a key requirement that information about the environment is processed efficiently, with steep hierarchies creating potential delays at each vertical step in the structure.

According to Van Assen et al (2000) agile aspirations are best met by a decentralised organisation structure where decisions are made closer to the customer and business units can react speedily to changes in the environment, appearing to echo the views of Goldman et al. This contrasts with an organisation with lean characteristics, where stability between the organisation, suppliers and customers is important, eliminating the need for decentralised decision making. Bennis and O'Toole (1993) highlight the issue of organisational size, with small to medium enterprises traditionally being regarded as more agile, since they carry less hierarchy and decisions made closer to the customer. The issue of organisation size, whilst relevant to the agility discussion raises the question as to how size can be defined with Shalit and Yaniv (2011) identifying two possible routes – evaluation of assets or complexity such as staff numbers. The corresponding downside of being diminutive is one of scale economies which mean they are often not able to support concurrency and often lack the diverse skills base of their larger counterparts which restricts sensing capability. The issue for larger organisations therefore is how they can simultaneously reap benefits of scale whilst emulating the qualities associated with being small. Shalit and Yaniv (*ibid*) support Bennis and O'Toole (1993) and posit that size is correlated with inertia and it is *inertia* which is inconsistent with agility. Glenn (2009) however appears to contradict this view and uses the findings in the Economist Intelligence Report 2009 which suggests the majority of CEOs (44% of those included in the research) feel mid-size organisations outperform both their smaller and larger brethren since they possess the duality of responsiveness and entrepreneurial capability. Glenn feels the combination of flatter structure and resources serve to enhance rapid decision making and access to and flow of information.

Ryall (2009) suggests it is incumbent upon managers not to manage with deterministic precision but to set a collaborative framework which drives organisational effort in the desired direction and allows subordinates to judge which

activities are completed. Walsh et al (2002) refer to this as 'open-book' management, which is augmented with communication of current position and seamless flow of information. The research by Walsh et al into twelve private sector firms and three public sector bodies in New Zealand reveals widespread use of flat structures, cross functional teams and autonomy, though the public sector does tend towards greater hierarchy, with the private sector seen as more autonomous. Richardson (2012:62) however stresses the significant role leaders have to play in agile outcomes, suggesting 'agility is a higher order challenge'. Crocitto and Youseff (2003) suggest organizational agility is the culmination of blending organizational processes and characteristics with technological advances. This in turn provides a platform for the provision of high quality products and services and is, therefore, a prerequisite to maintaining a competitive position. Whilst the authors focus on the interplay between organisational traits and technology, it is suggested these connections are based upon leadership, culture, and reward systems within the organisation providing a foundation. Inclusive decision making, providing enrichment and training along with a workable reward system, also help to stimulate an agile organisation, the authors suggest.

Srivastava and Frankwick (2011) highlight the stewardship of top management, along with the level of environmental change as having a significant influence on organisational learning, consistent with the 'top-down' view of leadership highlighted by Thorpe et al (2011). This would appear to be consistent with the leadership imperative within configurational theory which considers the influence the CEO has upon the organisation where the level of influence is contingent upon organisational size. Srivastava and Frankwick (2011) suggest a symbiotic relationship between management attitude, environmental turbulence and organisational learning to the extent that a positive attitude in isolation in rapidly changing conditions might not be sufficient to drive learning.

Speed of Response

Guillen and Garcia-Canal (2010) use case studies in considering the global success of Spanish companies and conclude that speed is a key attribute but this is closely linked with architecture. Burdett (1993) sees a more obvious link to learning in the sense that, not only do organisations have to develop skills and competencies, they need to achieve this rapidly. Hormozi (2001) agrees that whilst speed is an integral component within the agile organisation, attempts at changing too rapidly carries risk.

Zaheer and Zaheer (1997) consider alertness and responsiveness as prerequisites for organisations in rapidly changing environments, relating this to the resource based view of the firm and network theory and assert that firms which are able to achieve this tend to have a more significant influence on the industry. Whilst the research was conducted in 1997, it does carry relevance to the agility discussion since it focuses on the global currency trading industry which is fast-moving by nature, though it needs to be recognised that industry characteristics might be idiosyncratic. The authors conclude that firms able to lead in response to information will gain relative to those which are tardy, and in fast-paced environments, 'catch the wave'. The result of alertness and responsiveness manifest themselves in 'uncertain imitability' making replication by competitors difficult, reflective of causal ambiguity posited by Reed and DeFillippi (1990) and Ryall (2009). Eisenhardt et al (1995) assert there is no single formula for improving speed but it is multiple combinations of factors.

Davis and Atkinson (2010) make the differentiation between strategic and operational speed, with many organisations conflating the two. Operational speed can be illusory since there is often a quality compromise and this contrasts with strategic speed, which reduces the time to deliver value. Whilst providing an interesting insight, and based upon 343 organisations, the research contains no meaningful information on measurement criteria and is developed by a consultancy firm. Martin (2010) offers a contrary view that a demarcation between strategy and execution is pointless and damaging to the organisation and those within the firm have a collective responsibility towards choosing (strategy) and doing (execution). This view is predicated on top management creating a vision which steers decision making further down the organisation.

Guillen and Garcia-Canal (2010) use the retailers Zara and Pronovias as bell-weathers for strategic speed, suggesting it is the vertical integration of the groups which reduces time from design to market, fully consistent with the concept to cash model of Goldman et al (1995). De Treville and Trigeorgis (2010) use a case study involving a Swiss company, Flexcell, to illustrate the difficulties facing organisations embarking on a global strategy where risks are mitigated by placing functions such as design and manufacturing in the same location. Whilst demand can still be difficult to anticipate, this configuration allows enhanced responsiveness and customisation. This is consistent with the views of Darr et al (1995) who relate proximity to knowledge transfer to the extent that efficient knowledge transfer between units in

the same corporation improves productivity. Of course structure and optimisation within the firm may seem obvious but the wider consideration is configuration of the supply chain which facilitates the customer proposition and this has equally far-reaching implications for the agile firm and this issue is discussed next.

Value and Supply chains

Christopher et al (2004) refer to research by Harrison et al (1999) which posits that an agile supply chain displays a number of characteristics:

- It is market sensitive to the extent that it can identify consumer trends
- Making use of virtual connections to gather and share information with supply chain partners
- It leverages the capability of specialist firms to form networks
- There is a high degree of connectivity between members of the network

In addition, the authors use the fashion industry as the epitome of agility since it typically displays the following characteristics:

- Short life cycles
- High volatility
- Lacking predictability

The implications for the supply chain are significant since the traditional methods of meeting demand are forecast-based, resulting in a shortage of or surplus inventory with the latter leading to increased cost. This issue is exacerbated by the trend of sourcing from overseas and where the range of suppliers is diverse. When life cycles are short, Christopher et al (*ibid*) regard the ability to identify trends and respond to these by translating them rapidly into products, as being imperative, analogous with the concept to cash principle advocated by Goldman et al.

Backhouse and Burns (1999) consider agility in relation to the value chain, highlighting that organisations have shown a distinct shift to focussing on core activity (a shift up the value chain) and this has implications for suppliers. This is consistent with the findings of Womack et al (1990) who contrast the shift away from mass-production, where producers used many suppliers of common components, to

supplier firms reconfigured in tiers, each feeding completed inventory into the next stage of the process. Whilst the drive for efficiency highlighted by Womack et al (*ibid*) seeks to eliminate excess inventory, McCann (2004) suggests this was actively used to provide flexibility in the mass-production era. Dove (2001) argues that one unintended consequence of this was the impact on suppliers, since car makers seek to reduce inventory and configure production based upon real-time sales data, this has places enormous pressure on suppliers who have to be proficient at production variation or suffer additional cost of inventory themselves. Whilst providing useful insight into the reconfiguration of the value chain and the effect this had on performance improvement in the Japanese car industry, the Womack et al (1990) research relates to a halcyon period for Japanese industry. Since 1990, the Japanese economy has performed poorly with industry caught in a competitive spiral of convergence (Porter 1996). Black and Morrison (2010) quantify this performance in terms of share of revenues amongst Fortune 500 companies, with 141 entrants on the list delivering 35% of total revenues during the mid-1990s, reducing to 21% by 2000 and just 68 companies generating 11% by 2009.

Christopher (2002) in contrast does point to the quality of supplier relationship as an important supply chain element for achieving agile outcomes. Drayton and Budinich (2010) refer to the concept of the 'hybrid value chain' which allows collaborating firms to engineer the value chain in an optimal way which is just not possible when organisations think and act independently. The views of Drayton and Budinich (*ibid*) are consistent with those of Christopher (*ibid*) who identifies two key characteristics of an agile supply chain. First, suppliers need to be market-sensitive and able to share information with other elements of the supply chain and second should be part of a network which acts as a supply chain to compete with other chains.

The research by Backhouse and Burns (1999), although limited to the value chain of a single organisation does consider the efficacy of measurement systems in driving agility with the suggestion that agile value chains will be elusive if individual constituents do not have measures aligned to the overall objective. Wheelen and Hunger (2000) refer to this as sub-optimization where one division or functional department views itself as independent and this lack of unity has negative implications for the entire organisation or value chain. The CIPD (2011) refers to 'shared purpose' which connects the organisation's raison d'etre to a purpose shared by the workforce, with leadership and engagement being hugely influential but with efficacy undermined by conflicting or competing goals (sub-optimisation). Christopher

and Towill (2000) regard reduction in lead-time as a prerequisite for the agile enterprise since a slow and cumbersome supply chain will not be able to support volatile and unpredictable demand. An agile supply chain needs to be market sensitive or demand driven which is the ability to scan and respond to demand. This contrasts with the traditional value chain which due to a paucity of customer information, becomes forecast driven, using historic sales data to build inventory.

Mason-Jones et al (2000) identify the need to 'compress information time'. Since traditional supply chains operate with customer information being held exclusively by the unit closest to the customer and then passed upstream, there is a risk of distortion with each successive linkage. Mason-Jones et al (*ibid*) advocate an 'information enriched supply chain' which is desirable in a lean chain, but essential in the agile chain (Christopher and Towill 2000). McCann (2004) highlights the issue of 'system theory' which considers individual, group and organisational idiosyncrasies as one value system. This means changes in one or more parts of the organisation can have implications for another, an issue often overlooked in change programmes. The next two sections consider two distinct change patterns, starting with that of a more disruptive nature, followed by change of a more incremental nature.

Change Management

Zhang and Sharifi (2001) support the view of Hayen (1988) around the concept of change being nothing new but taking place at an unprecedented rate, creating turbulence and unpredictability within the business environment. In contrast to proponents of change, Alas (2007) draws on research by Porras and Robertson (1983) which illustrates that fewer than 40% of change initiatives actually yield positive outcomes and this often flounders as a consequence of ineffective employee participation. Adapting to relentless change has become inevitable for the modern organisation, according to Branson (2008) and lack of change capability will likely consign firms to failure. Branson defines change as 'new environmental forces' impacting the firm and these include technological advances, globalisation, uncertainty, unpredictability, volatility turbulence and discontinuity. Dunphy and Stance (1988) consider change in the context of a contrast between incremental and evolutionary with transformative and revolutionary. Incremental change occurs in relatively stable environments and in instances when the organisation is in-step with the current external environment and there is a high degree of predictability. Transformation conversely occurs where the fit between the organisation and its

environment lacks compatibility or in crisis type situations where survival of the firm can only be achieved through transformation. Kidd (1994) refers to morphostatic change which suggests change is incremental in nature and as a consequence, the established order is preserved since change is implemented through minor adjustments. This contrasts with morphogenic change whereby information gathered highlights inadequacies in established practices leading to change that creates a fundamentally different order, consistent with the punctuated equilibrium model posited by Romanelli and Tushman (1994).

Traditional response mechanisms have tended to be downsizing, mergers or restructuring which have met with limited success (Blenko et al 2010, Christensen et al 2011). Branson (2008) furthers the argument by suggesting such profound change has a detrimental impact on organisational effectiveness due to the adverse social, physical or emotional effect on individuals residing within the firm. McCann et al (2009) link change management techniques to agility by identifying two key elements – a readiness to change, supporting the views of CIPD (2011) and rapid execution, this being consistent with the scanning and responding capabilities identified by Dove (2001) and Sambamurthy et al (2003). McCann et al (ibid) suggest success in this respect can entail the organisation dismantling traditional cultural and structural barriers but argue resilience, which deals with 'robustness', is a fundamental realignment of the collective identity, purpose and beliefs around minimising the impacts of change within the environment. The authors are explicit in their view that agility and resilience are unachievable unless these characteristics are manifest within individuals and teams across the organisation.

Haneberg (2011) contrasts agility to change management with the latter being a collective term for facilitating individual changes. Agility is a less prosaic term which is concerned with day-to-day activities and attitudes allowing the firm to be adaptable. There does though appear to be a more ominous parallel between the wider change management term and agility since agility is predicated on attitudinal traits which have historically acted as a barrier to successful change programmes (Alas 2007).

Shalit and Yaniv (2011) suggest younger firms are more likely to embrace marked organisational change but the corresponding trade-off is that with maturity, organisations build experience of more varieties of change, which tends to

support the theory of absorptive capacity advanced by Cohen and Levinthal (1990). Shalit and Yaniv refer to Lewin's force field theory which states the driving forces for change must exceed forces resisting change as a prerequisite for successful implementation. This would appear to reflect the views of Dyer and Shafer (1998) that firms lose competitiveness when the environment evolves more rapidly than the capability for change develops within the organisation. The implication for the modern firm is that to withstand the dynamic environment, survival means repeatedly applying Lewin's force field theory, with agile capability conferred to those able to respond easily when needed. Shalit and Yaniv (2011) conclude that agility is associated with frequency of change which contradicts the views of Van Oosterhout et al (2006) and Dove (1995) that agility is a response to unpredictability.

Huy and Mintzberg (2003) suggest change centres around three themes. The authors conclude that no one change paradigm is successful in isolation and organisations should be balanced across one or more of the other change themes.
Dramatic refers to change imposed by the top hierarchy of the organisation, usually in response to crisis or opportunity. Systemic change is more gradual and sequenced in nature and often imported into the organisation, often by catalysts such as consultants. Organic change arises without formal structure but evolves from the body of the organisation and it is the latter, more progressive change patterns I consider next.

Adaptive strategies

Romanelli and Tushman (1994) refer to the phenomenon of punctuated equilibrium which suggests organizations experience periods of often protracted stability interspersed with shorter periods of profound change. These radical bursts of change, which impact most parts of the organisation are necessary to loosen inherent inertia but subsequently become the basis for renewed stability. The stimuli for discontinuous change are often themselves discontinuous in nature, for example major changes in the external environment or changes in key top management personnel. This contrasts with more linear change initiatives which incrementally do not result in business transformation.

Grant (1991) refers to industry evolution as setting the tone for adaptive strategy and it is incumbent on organisations to shift their strategies as the key success factors for that industry change. This appears to echo the views of McCann et al (2009) who regard turbulence as debilitating for organisations with insufficient adaptive capability, but the corollary is adaptive capacity becomes a moderator of turbulence. This enables organisations with high levels of adaptive skill to gain competitive advantage over their less endowed peers. Brown and Eisenhardt (1997) agree that whilst punctuated equilibrium is concerned with periods of stability and alternate bursts of radical change, in industries such as retail or IT, change is less episodic with organisations having to meet the challenges of short product life cycles and high velocity markets through continuous rapid change. Kotter (2008) views a shift from episodic to continual change and this means a culture of urgency will become a permanent requirement for organisations, as opposed to periodically. The essence of adaptation according to Eisenhardt et al (1995) is a consistent flow of new products that over time serve to reposition and reshape the organisation but firms need the requisite capabilities to effect adaption efficiently to meet the demands of fast-paced environmental change.

Rohrbeck (2010) highlights the relevance of two distinct change patterns as companies need contrasting capabilities - the ability to adapt incrementally in periods of gradual change and radically to meet the demands of discontinuous change. McCann and Selsky (2003) draw a distinction between agility and resilience. The challenge for organisations is no longer coping with the pace of change, but the extent of disruption inherent in the changing environment. The authors conclude that agility is concerned with managing rapid change and resilience the disruptive nature but in a later study McCann et al (2009) regard adaptive capability as a composite of the aforementioned characteristics – agility and resilience. Given the nature of agility is being able to respond to unpredictable changes (Van Oosterhout et al 2006, Dove 1995) organisations must first demonstrate competence in managing predictable change meaning adaptive capability is the prerequisite for a firm with agile aspirations.

Co-operation

Alliances and networks

The demand for customised solutions has brought with it a need for organisations to co-operate both internally, removing silos, and externally, according to Maskell (2001). This is predicated on no organisation possessing all the requisite skills to deliver the full customer proposition (Kidd (1994), Van Hoek et al (2001)). Hormozi (2001) provides an international context to this by illustrating Japan is foremost in the use of alliances. Often alliances are based on no formal legal basis, consume limited capital resource but are formulated and dissolved rapidly, a phenomenon referred to by Kidd (*ibid*) as 'virtual corporations'. Whereas Goldman et al (1995) refer to 'virtual organisations', Brown and Eisenhardt (1997) suggest organisations with the hallmarks of structure and chaotic elements and this duality is referred to as a 'semi-structure'. From an internal perspective, Grant (1991) supports the view of Mintzberg who refers to 'Adhocracies' which are flexible organisations designed to collaborate around problem-solving or tasks not deemed routine.

Goldman et al (1995) regard co-operation both within and among companies as a key gateway to the competitive advantage derived from agility. Branson (2008) highlights a natural aversion to co-operation since this often entails a personal cost in the form of time, effort or resource, meaning self-interest predominates. Martinez-Sanchez et al (2007) suggest the level of co-operation is determined by the competitive strategy of the organisation, to the extent that cost leaders will actively seek purchasing and outsourcing agreements to procure cost benefit and enhance competitiveness but the issue with differentiators is less definitive with outsourcing still relevant however, since the basis of differentiation lies within the firm, care is needed not to outsource functions which provide the very basis for differentiation. The authors are however unequivocal that inter-organisational co-operation can lead to unique combinations of resources, fully consistent with the notion of causal ambiguity (Reed and DeFillippi (1990)).

Zaheer and Zaheer (1997) relate information gathering and competitive advantage to network theory which asserts two approaches for seeking information from a network. Alertness requires that organisations are 'plugged in' to information networks and the position a firm holds within its network holds significance, yet positioning is not passive

or serendipitous but strategically driven. The first approach is ‘multiple weak ties’ which are defined by the contact frequency within a network and holds that multiplicity increases the opportunity for exposure to information which might not be derived from a narrow or industry centric network. The second is ‘bridging structural holes’ that might exist between unconnected players in a network. On the basis that less connected operators in a narrow network might suffer a dearth of information, value is delivered when bridging occurs with firms associated with alternative information networks.

Bennis and O’Toole (1993) consider ways in which large organisations can display characteristics more traditionally associated with more diminutive counterparts, known as federalism. Here, many small enterprises cooperate, often transcending global boundaries to achieve a common purpose. Srivastava and Frankwick (2011) regard the fundamental basis for alliances being cross-organisational learning but firms attempting to build capabilities through acquisition are similarly often disappointed with the results, according to Capron and Mitchell (2010). Ryall (2009) continues this theme by arguing that because smaller firms can be more difficult to imitate, this often makes them good acquisition material, and contends this is the only route available to larger firms to observe their secretive structure. Guillen and Garcia-Canal (2010) refer to Spanish organisations which actively use strategic alliances to mitigate risk in early cycle strategic initiatives and networking with public bodies to assimilate knowledge which allows them to anticipate environmental changes.

Gari (1999) however suggests a contrary view, indicating that organisations reaching for competitive advantage through strategic alliances and partnerships are often disappointed since most joint ventures fail to deliver the anticipated benefits. This is quantified by Lovallo and Kahneman (2003) who highlight that three quarters of mergers and acquisitions fail to deliver value and Christensen et al (2011:49) suggesting the failure rate might be as high as 90%, with acquiring firm shareholders losing more than target organisation shareholders gain. Christensen et al (*ibid*) suggest this might be linked to the often misdirected motives behind acquisition since these are often propagated upon boosting current performance or reducing costs, neither of which fundamentally alters the company trajectory and any improvements are often anticipated by investors. This echoes the view of Cartwright and Cooper (1993) who suggest many alliances are founded upon financial or strategic criteria, yet are undermined by cultural differences between alliance constituents.

Kay (1993) however refers to architecture being one of the key enablers which allows firms to 'add value' (the others being innovation and reputation). Architecture represents the complex system of relationships both within and external to the organisation. A firm exhibiting distinctive architecture captures benefit from the flow of information as a result of these relationships. Allee (2009:429) agrees, referring to value networks, which can be internal or external, as 'any purposeful group of people or organisations creating social and economic good through complex dynamic exchanges of tangible and intangible value'. Tangible tend to be more contractual by nature, with intangible being more concerned with informal yet critical exchanges of information. Value networks draw on social exchange theory and aim to translate individual assets into shared, to facilitate transactions. Allee (*ibid*) suggests the key for the agile enterprise is the speed with which information can move around such networks to support problem-solving and highlights the example of Boeing which shifted from a linear mind-set to a system of multiple pathways, fully consistent with concurrency (Goldman et al (1995)). Gari (1999) concludes that successful alliances are structured to allow for experimentation and rapid dissolution.

Whilst one of the key motivations behind partnerships and alliances is organisational learning, it is also worth examining the way in which distinctive capability helps to shape agility and this is explained next.

Distinctive capabilities

Drucker (1980) suggests a common failing of public and private sector organisations is a misconception that they can be a 'leader' in all areas, a view shared by Kay (1993), with the latter suggesting successful organisations do not compete on all fronts, but aim to outperform their competitors along key dimensions of competence, a key to this being recognition of a firms own distinctive capability. Drucker regards strengths as unique, an issue refuted by Kay (1993) who argues strengths cannot be distinctive unless they are idiosyncratic, with many firms being delusional that they possess more unique capabilities than they do. Drucker does however connect the issue of distinctive capability to turbulent environments suggesting organisations need to constantly review their inherent strengths for congruence to the environment and what capabilities will be needed to meet the changing landscape.

Cepeda-Carrion et al (2012) posit that obsolete knowledge can be a serious inhibitor in rapidly changing environments and it is incumbent on managers to create a

'culture' of continuous 'unlearning', consistent with the views of Govindarajan and Trimble (2011) and Hamel and Prahalad (1994), with the latter suggesting competencies should form three purposes – to facilitate access to a variety of markets, provide customers with 'added value' (Kay (1993)) and they should be difficult to imitate. Ryall (2009) suggests learning can be explorative whereby developing one's own experience, referred to as 'learning by doing' or absorptive in the sense of learning from external sources, referred to as learning by observing. Exploratory and absorptive learning capabilities are complimentary in strategic terms and Ryall (*ibid*) argues capability based competitive advantage is achieved only if both learning types are protected from imitation through causal ambiguity and this in itself is linked to organisational size. Ryall suggests because the linkage between causal ambiguity and complexity of interaction is not correlated, causal ambiguity can be relatively simple which can result in the strategies of small embryonic firms being harder to imitate than their large more established brethren. He cites the example of Southwest Airlines whose activities are simpler than its competitors but is not bounded by formality meaning it is difficult to observe heterogeneity in outcomes and it is looseness which prevents imitation.

The external environment

Lampel and Mintzberg (1996) suggest a mix of demand and supply side factors have created a new paradigm. They refer to changes in consumer assertiveness, intense competition and technological advances which have combined to shape the operating environment. Fliedner and Vokurka (1997) clearly position agility as a demand-side issue but as a natural consequence of choice. Customers increasingly demand high quality, customised products at low cost, thus superseding the views of Hayes and Wheelwright (1979) on trade-offs. Kidd (1994) suggests that in a manufacturing context, lower cost, high quality, rapid and flexible response are needed, without trade-off, to compete in markets that are more global in nature. Fliedner and Vokurka argue customers are able to demand this as a result of an enlarged supply base from which to choose. The global market and increased supply-base is not however restricted to manufacturing and would appear equally relevant to services. The importance attached to the ability to adapt to the environment has been evident since the 1960s (Vazquez-Bustelo et al 2007) with empirical data suggesting this capability has a direct impact on business performance. The significance of the external environment in relation to agility is considered by Kotter (2008), who highlights a common disconnect between an internal perspective and the operating environment

outside the organisation to the extent that an 'inside-out' ethos tangibly diminishes organisational urgency. This is because internally focussed organisations lack the sensing capabilities for new opportunity or threats, creating blind-spots. Kotter (*ibid*) suggests excessive focus on internal systems and process eventually stifles entrepreneurial drive, leaving the organisation bereft of capability for reading the external environment. This would appear consistent with the views of Kidd (1994) that rigidity in systems will stifle the ability of the organisation to respond to changes in the external environment, with this being more acute in times of rapid change. This contrasts with the views of Johnston (2007) who suggests the resource based view (RBV) of the firm actively encourages the focus on internal capabilities to build an 'inside-out' perspective. Johnston however also draws on the work of Penrose (1959) to illustrate that an internal view of resources can create duality - facilitation of and constraint to expansion.

The views of Overby et al (2006) appear to mirror those of Van Oosterhout et al (2006), since Overby et al refer to 'enterprise agility' as consisting of two components – sensing and responding - and are concerned only with the capabilities related to these. Schoemaker and Day (2009:83) define sensing (or interpreting) as being the 'weakest link in the process of capturing weak signals' which will help to improve decision-making. Overby et al (*ibid*) view sensing and responding as symbiotic since a strong sensing capability would be wasted without an inherent capability to respond and vice versa. The key to lasting success therefore appears to lie in a capability to identify early signals of environmental change and react to these rapidly and repeatedly. The theme of speed is reinforced by Brown and Eisenhardt (1997) since the ability to evolve quickly in volatile markets is reinforced by regular appraisal of actions. Similarly, rapid adaption and response reduces risk of wasting resource on obsolete processes. Sambamurthy et al (2003) continue the issue of reacting quickly and highlight two capabilities as enablers for entrepreneurial alertness – strategic foresight and systemic insight which, together with agility, equip firms often with imperfect knowledge, to seize opportunities. Strategic foresight is the ability to anticipate discontinuity in the external environment which is an amalgamation of personal and institutional experience. Systemic insight is concerned with matching digital and agile capability to opportunities as a foundation for competitive moves, the need for this being more acute in complex and fast-moving environments.

Organisational agility is positioned around two dimensions, according to Zhang and Sharifi (2000). This is based on a modest sample of 6 UK companies but confined to

the manufacturing sector only. First, responding to change which can be either anticipated or unexpected. This is only partly consistent with the view of Van Oosterhout et al (2006) who consider agility in the context of unpredictable events. McCann et al (2009) suggest agility should be juxtaposed to and is contingent upon, resilience. This is based upon a study of 471 US companies suggesting those displaying agile and resilient traits are more profitable, though agility is more strongly associated with competitiveness than resiliency. This is because competitiveness and the ability to seize opportunity are informed by insight and rapid deployment, more closely associated with agile behaviour. The research is confined to the US and appears to contradict other authors with the notion that resilience moderates agility and thus response time, a key trait of the agile organisation (Sherehiy (2008), Guillen and Garcia-Canal (2010)). The authors suggest agility in isolation creates risk by making the firm fragile or vulnerable to unpredictability and the modern organisation, being generally more exposed to changes in the environment, now needs to be more resilient, whilst recognising an over-emphasis on resilience will make the organisation slow in responding. The second dimension proposed by Zhang and Sharifi is the ability to exploit changes for advantage, referred to by Kay (1993) as appropriability. Shalit and Yaniv (2011) draw on research by Dess and Beard (1984) to define dynamic environments as being characterised not only by unpredictable, but also rapid change which serves to increase uncertainty for organisations.

Zhang and Sharifi (1999) research highlights the need for organisations to become adept at anticipating changes in the external environment and the authors' conceptual framework focuses on the identification of:

- Agility drivers – factors that create the need for change within the organisation
- Agile capabilities – essential skills required by the organisation to respond positively
- Agile providers – means by which capabilities can be acquired or developed

A corresponding three stage process is required to facilitate this:

- Identifying agility needs and comparing to current agility level
- Assessing capabilities for agility
- Identifying tools and resources required

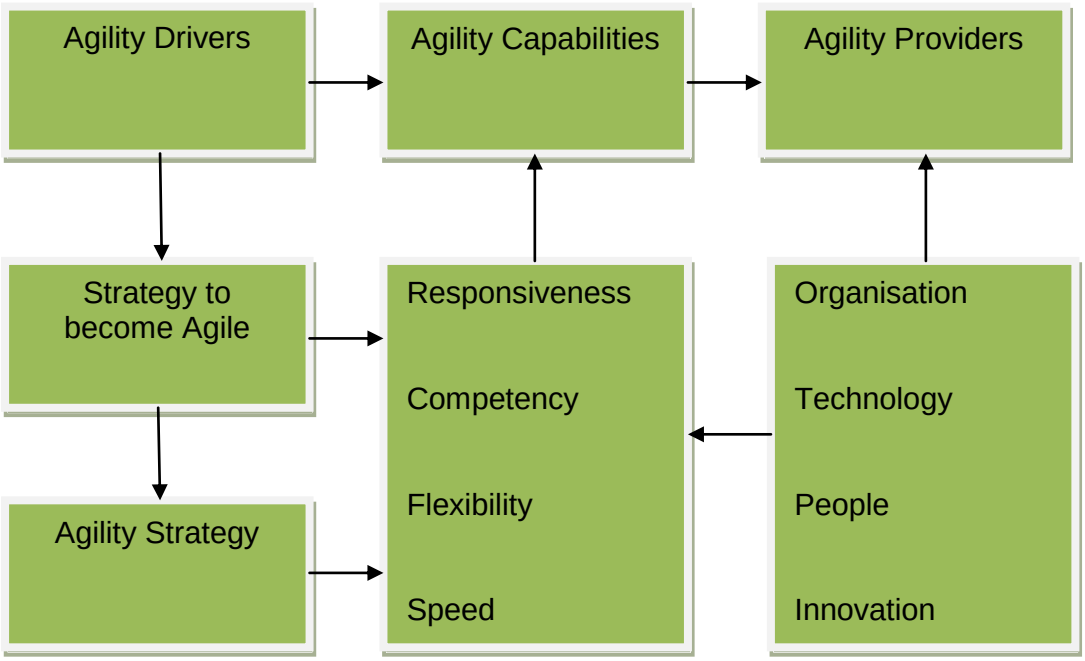


Illustration 5 A conceptual model for Agile Manufacturing Zhang and Sharifi (1999:11)

The ability to scan the external environment is an essential enabler for the agile organisation according to Jackson (1997). Overby et al (2006) refer to 'enterprise agility' as the ability of organisations to respond to changes in the environment, with the role of information technology as an enabler but suggests one of the drivers for this is 'increasing demands from customers' (p120). Grant (1991:99) argues however, that whilst assessing the industry environment is important to organisations, this plays only a minor role in shaping profitability. Grant refers to six studies carried out between 1995 (Schmalensee) and 2006 (Misangyi et al) which conclude industry effects accounted for less than 20% of the variance in inter-firm profitability, with Rumelt (1991) placing industry effects as contributing as little as 8% of profit variance with business specific issues accounting for 46%.

Sambamurthy et al (2003) consider the environment in relation to strategic conduct by suggesting this is only relevant in stable or slowly evolving environments and that when change is more fast-paced, long term competitive advantage is mostly elusive. Instead, the authors suggest firms should aspire to a series of short-term advantages through varied competitive actions. D'Aveni (1994) suggests that the rapidly changing environment combined with intense competition means that continuous change is inevitable but describes the competitive landscape as having several important elements. He agrees with Sambamurthy et al that long term competitive advantage is often elusive as firms continually 'disrupt' competitive stability in search

of economic rent (Kay, 2006) and this disruption is inevitable if competitive advantage is to be secured but D'Aveni (1994) concludes that advantage flows to those with the greatest propensity for competitive action.

Changes to the environment can be diverse and relate to competitors, customers, economic landscape, regulation etc. The capabilities needed to detect these may themselves be diverse and differ across industries, but in addition could vary according to the product life cycle, with Goldman et al (1995) using the example of technology playing a more prominent role early in the cycle. However organisations scanning the environment often overlook the more subtle changes in tastes or behaviour, according to Ofek and Wathieu (2010). The authors suggest this manifests itself in being late-to-market, thus losing out to more agile competitors. To mitigate this, Ofek and Wathieu (*ibid*) advocate developing a capability to identify major trends but also being alive to changes in consumer activity not directly related to the organisation's products. Mason-Jones et al (2000) relate this to the supply chain to the extent that any alterations first have to be grounded upon an understanding of the likely requirements around product variety and variation in demand. Nunes and Breene (2011) apply a similar concept, 'edge-centric' which blends internal elements (edge of the organisation) with external factors (edge of the market) and affords a relatively low risk approach to scan the periphery of the market for unaddressed customer needs.

Dealing with unpredictability

McGrath (2013) suggests lasting competitive advantage is rare due to unpredictability, citing intense competition, low barriers to entry and the digital age as change agents for this. She suggests this is even more relevant to services since lower entry barriers mean imitation is rife, leading to convergence. Drucker (1980) suggests events that are unique in nature cannot be planned, but can be foreseen and this is means formulating strategies which anticipate the areas where the probability of change is greatest, this being equally relevant to private and public entities. He asserts that herein lays the key difference between planning and strategy, with planning more concerned with optimising current trends into the future, with strategy aiming to seize advantage from new and emerging opportunities in the future. A key differentiator between planning and strategy appears to be whether a firm displays flexible or agile characteristics with several writers expressing views on the difference. Backhouse and Burns (1999) also suggest the organisation being able respond to unpredictable changes has become a

prerequisite for survival and view the notion of developing new skills and competences in order to respond to reducing product life cycles. They argue however that agility will be more prevalent in certain components of the value chain.

Sarker et al (2009) relate environmental scanning to agility by highlighting the distinction between organisations which adapt to incremental change through flexibility, with agility seen a natural extension of this, allowing organisations to adapt rapidly to unpredictable changes. Yusuf et al (2003) refer to flexibility in the context of seasonal demand which organisations should be able to plan for. Christopher et al (2004) agree on the importance of this but identify a key failing of organisations is the inability to identify demand changes in the final market-place. Baker (1996) suggests agility, whilst often conflated with flexibility, is in fact more strategic in nature, a view shared by Sherehiy (2008) and thus often incumbent upon the higher levels of the organisation. Fliedner and Vokurka (1997) also suggest flexibility encapsulates two dimensions – product/ service (volume, product mix, specification) and process (logistics, scheduling) but agility can relate to either of these dimensions. Nairan et al (2000) also advocate a two dimensional phenomenon with 'action flexibility' seen as an ability to take new actions to meet changed circumstances and 'state flexibility' the capability to function effectively in the light of an altered environment. Contextually, the authors point to the truncation of product life cycles which means manufacturing capability needs to support a broad product mix.

Sherehiy (2008) supports the view of Krishnamurthy and Yauch (2007) that this is the capability to switch tasks, with agility regarded as the strategic capability to adapt quickly to changes in the competitive landscape. Backhouse and Burns (1999) make the distinction between agility and flexibility by suggesting agility is an ability to respond to changes in the external environment, contrasting this with flexibility which is concerned with adapting to changes in customer requirements but within preordained parameters. The authors use a car showroom as an analogy – flexibility would be allowing a customer to choose from a predefined colour palette, agility would be the capability of the manufacturer to deliver a previously unavailable colour to meet changing tastes. They conclude that development of agile capability throughout the value chain might not be desirable but a balanced approach of external agility combined with internal flexibility is more optimal. Backhouse and Burns (*ibid*) suggest successful organisations need to be adept at both flexibility and agility, but in reality this is beyond the capability of many, and in response there is a need to develop alliances. Zhang and Sharifi (2000) suggest that, even within the same sector, organisations

face varying degrees of turbulence within operating environments, meaning agility drivers will vary. Moreover, the degree of agility required (agility need level) will be commensurate with the prevailing level of change and thus the mix of competencies required are heterogeneous.

Dove (1995) associates agility with unpredictability, but this could be as a consequence of when a change might occur as much as the ramifications. According to Narain et al (2000) however flexibility is concerned with disturbances to internal and external environments which contrasts with the views of Van Oosterhout et al (2006). The work of Narain et al deals with flexibility in manufacturing systems, and although this appears in the International Journal of Agile Management, agility as a concept is mentioned only cursorily and many of the references to flexibility align with agility concepts postulated by other researchers (Backhouse and Burns 1999, Van Oosterhout 2006). Dove (2001:12) also introduces the concept of scope which he suggests is the primary difference between agility and flexibility, with flexibility being 'the planned response to anticipated contingencies'. Agility however is where the unpredictable nature of change makes contingencies redundant so a fundamental recalibration within the organisation might be necessary. Scope therefore considers the distance of the end-point in relation to the starting position for change and thus relates to the magnitude of change (Dove *ibid*, Hormozi 2001) which means the organisation needs to be cognisant of scope in connection with the firm's ability to assimilate the extent of any change. Certain changes are predictable (for example regulatory change) and responses can be anticipated. The authors define this as flexibility with Volberta (1997) highlighting three variations – operational, structural and strategic flexibility. A corollary however is where change in the external environment is predictable but the impact on the organisation or the response is less so.

Vokurka and Fliedner (1998) consider flexibility in the context of an organisation being able to change tasks rapidly and as part of normal operations. This is qualified to the extent that the organisation should be able to predict changes so the requisite procedures for managing changes in tasks are already established. This contrasts with agility which deals with unpredictable change. This tends to reflect the view of Gurd (2011) who asserts that despite agility and flexibility sharing commonalities, agility encompasses the entire business (strategic), with flexibility more concerned with the manufacturing function (operational), consistent with the views of Dove (2001). Zhang and Sharifi (2000) agree flexibility is the ability to configure existing

resources to achieve different objectives or outputs, thus mirroring the ethos of the mass-production era.

Christopher and Towill (2000) suggest the new paradigm heralds the notion of 'network competition' where competitive advantage will be conferred to organisations that can configure close collaboration between supply chain partners which are in tune with the needs of the end user. This conflicts with the views of Eisenhardt et al (1995) who suggest sequential activity can be improved with a compression strategy, the premise being that product development is delivered by a series of predictable steps each of which can be shortened thereby reducing time to market (Vesey 1991, Goldman et al 1995). The problem with a compression approach lies in whether product development can be decomposed into predictable stages, particularly in unpredictable environments. Hormozi (2001) favours an integrated structure where functional departments work in unison to effect customisation. Blenko et al (2010) assert that structure will lead to superior performance only if it facilitates quality decisions being made more rapidly than competitors. In order to respond to changes in the environment rapidly, Goldman et al (1995: 99) use the analogy of the emergency room to advocate dedicated teams drawn from various areas within the business often at short notice, with Govindarajan and Trimble (2010) in agreement since it is unreasonable for workers to cope with forward thinking projects as these inevitably get crowded out by day-to-day activity. Govindarajan and Trimble (*ibid*) do however highlight the potential failing of this approach because such teams are often manned entirely from insiders who have views and biases shaped by past experience within the organisation, the result being a cultural microcosm of the larger group.

People

Enabling people

The concept of enabling employees is not a recent phenomenon as Folz (1993) identifies, with the shift away from hierarchical structures to 'semi-autonomous' or 'self-directed' teams. He asserts this change uses as its starting point a vision but success is contingent upon identification of the capabilities required to attain this and the subsequent creation of a 'road-map' which details how the various subsystems (e.g. structure, systems, policies) can be aligned to leverage the capabilities. Quader and

Quader (2009) agree, bearing witness to the move from bureaucratic structures to the importance of teams and this has served to improve firm performance on the basis that 'teams outperform individuals'. This however should be seen in context, since the research is based solely upon one case study, British Telecom. Quader and Quader (*ibid*:177) define teams as a composition of individuals with 'complimentary skills, shared leadership roles, mutual accountability, a specific team purpose and a common commitment' which combined lead to collaborative rather than competitive effort. They suggest the greatest challenge of constructing a high performing team is clear task definition which will in itself shape composition of the team and this ameliorates the risk of costly mistakes.

Sherehiy (2008) believes a cornerstone of the agile enterprise is autonomous workers, who are empowered to resolve small operational issues, without line manager approval. Autonomy requires employees to focus on multiple facets of the job simultaneously which brings with it 'cognitive complexity', but Sherehiy argues this promotes adaptability within the organisation. This is in contrast with 'system complexity' which serves to impede reaction capability.

Goldman et al (1995:107) regard the configuration of people and information and the subsequent impact these have on profitability, as critical for an organisation with agile aspirations. The authors suggest an agile workforce is assembled from people who are 'knowledgeable, informed, flexible and empowered' which distils into a workforce able to rationalise what it is doing, can continually learn and assimilate new skills and is adept at responding to changes in the environment. Implicit within this view is an assertion that management is accountable for facilitating learning, sharing information and utilising technology to equip workers to meet the agile agenda. Norgaard (2001) agrees but suggests there should be no underestimating the cultural shift from task driven authority and control to people and performance yet the latter defines the baseline for creating conditions where people are engaged and contribute.

Greasley et al (2007) suggests the issue of empowerment is one where workers are provided with an element of autonomy around making decisions which affect their work, on the premise that employees are more creative when their level of responsibility is increased. Mirroring the view of Handy (1976) this certainly has parallels with agility where tight control appears to impede innovation (Damanpour (1996, Palmberg (2009)). The CIPD (2011) agrees that empowerment whilst desirable, does need to be within clear boundaries which in turn are linked to corporate goals which is again consistent

with Greasley et al (2007) who emphasise the need for employees to understand the vision and direction set by senior management. Greasley et al also regard the acceptance of empowerment being contingent on a 'willingness' to be empowered and this has a direct linkage to competence, since increased perception of expertise, will improve acceptance of empowerment.

Branson (2008) suggests organisations tend to be too externally focussed in relation to change, contradicting the views of Kotter (2008). Branson argues that changes are often so directly influenced by externalities, essential changes within the organisation are overlooked or subordinated. The importance of this in relation to enabling employees is the strong correlation between the quality of individual contribution and the ideology of the firm, though the author does recognise a dearth of empirical research to support this. This appears to mirror the need for motivated people and the literature relating to this is described in the next section.

Motivating people

Greasley et al (2007) suggest a contested theme of empowerment is whether this carries benefit for the employee or the firm, but refer to research by Koberg et al (1999) which posits that employees with a higher perception of empowerment, enjoy greater job satisfaction and motivation, though this is contested by Collins (1999). Quader and Quader (2009) suggest the organisation of work into teams can lead to improved job satisfaction through increased engagement with decision-making. McGregor (1960) examines the behaviour of individuals at work and formulate two models , theory X and theory Y. Theory X suggests that individuals:

- Have an inherent dislike of work and will avoid it if they can. This aversion dictates that workers must be controlled and threatened before they work hard enough.
- Prefer to be directed, dislike responsibility and above all else, require security
- Are resistant to change
- Are indifferent to the needs of the organisation

Moreover, theory X managers do not give staff opportunities to fulfil themselves but instead require them to behave in an expected fashion. He suggests there are occasions when this strategy works, for example when employees do not believe the

goals are desirable but in a context of change however, it is incumbent on managers to establish which needs drive employees. Theory Y suggests:

- People are not passive or resistant to change but may become so as a result of experience in an organisation
- Expending physical or mental effort is natural
- Control and punishment are not the only method of getting people to work, they are self-directed if committed to the organisation
- The average worker learns, under proper conditions, not only to accept but seek responsibility
- If the job is satisfying, this breeds commitment to the organisation

Moreover, management is not only responsible for positioning the organisation in such a way as to meet an economic end, but also to set an operating model which allows people to meet their own goals best by directing their efforts towards those of the organisation. In situations where it is possible to get 'buy-in' to objectives, it is still desirable to explain the purpose of any action as this is more likely to improve output than by direction which the workforce did not understand. If employees are motivated, given flexibility and have a clear understanding of where they fit in the organisation, managers will find a participative approach to problem solving yields greater results than a dictatorial regime. Goldman et al (1995) suggest the behaviour of workers is influenced by the level of clarity given to them by managers around how their performance will be measured and given the cross-functional nature of teams within agile organisations, performance metrics should be reflective of this.

Bennis and O'Toole (1993) regard top management as responsible for setting the vision for the organisation, equipping the workforce with clear direction and rationale and to remove barriers to achievement. The CIPD (2011) regards this as a question of equilibrium since the need to empower workers needs to be balanced by laying down a framework of agreed parameters. Alas (2007) refers to a study by Purser and Pasmore (1992) among research and development professionals, which concludes that working on challenging and stimulating problems is the primary source of job satisfaction. The CIPD (2011) assert that engagement can occur on a number of levels meaning workers can be engaged overall but displaying lower level engagement to the organisation and this often occurs when their team or business unit is seen as disconnected from the wider organisation. Moreover, Quader and Quader (2009) posit

that in high performing firms, motivation is closely correlated with organisational success.

Goldman et al (1995) continue that reward is an important part of creating and agile culture and this should include part of remuneration being contingent upon team performance or activity rather than that solely of the individual. Reward in this sense is a combination of financial and non-financial reward. Crocitto and Youssef (2009) agree management should create a vision of agility and subsequently structure reward schemes around scanning, change acceptance and assimilation. A danger here is the dysfunctional nature of reward schemes which reward one functional activity at the expense of another, a concept referred to as sub-optimisation (Grant 1991). Quader and Quader (2009) continue the reward theme by suggesting pay is an extrinsic motivator, that which is not directly related to the task, but can have a marked short term impact on performance but seldom a lasting one, in contrast to intrinsic motivators such as responsibility, enriching work and development opportunities which tend to be self-generated rather than imposed. This echoes the view of Herzberg (1968) who identifies monetary reward (along with security, policies, working conditions) as a 'hygiene factor' where absence has a demotivating influence but motivation is achieved through achievement, advancement, responsibility, recognition and the nature of work. Kohn (1993) furthers the argument by highlighting one unintended consequence of financial rewards is the tendency of people to denigrate interest in the work which brought about the reward.

Palmberg (2009) further asserts top management should create an environment of 'tension and instability' as this will promote flexibility and innovation within the organisation but recognises there is an optimal position since excessive tension has a debilitating effect. Breu et al (2001) suggest agility is delivered through empowerment and autonomy, this being contingent upon a decentralized organization with limited managerial layers to aid expeditious decisions (Krishnamurthy and Yauch 2007). This mirrors the findings of Glenn (2009) that fast decisions are a defining characteristic of agility according to almost two-thirds of CEOs and is also consistent with the views of Goldman et al (1995) that work-force motivation is optimised by passing decision-making authority down the hierarchy. This cultivates the ethos that satisfying customers is the responsibility of all within the organisation and empowerment means problems are able to be resolved rapidly and at source. Crocitto and Youssef (2009) suggest management should also foster a learning culture which supports agile ambitions and this will inevitably involve

dismantling traditional hierarchies. The theme of a learning culture is considered more fully in the next section.

Nurturing competencies

McCann (2004) suggests the need for expeditious organizational learning started to gain importance as early as the 1960s. McCann notes the work of Trist (1965) who refers to the advances in technology and interdependence of organisations having a marked impact on the environment. Plonka (1997) suggests the demands of an agile enterprise are supported by agile traits within the workforce:

- Attitude toward learning and development
- Ability to problem solve
- Acceptance of change
- Innovation and new ideas
- Accepting new responsibilities

Johnston (2007) uses research by Govindarajan and Trimble (2011) that attainment of dynamic capabilities is dispensing with assumptions that delivered past success, mirroring the views of Hamel and Prahalad (1994:65) around 'unlearning'. Drucker (1980:46) agrees that in turbulent environments, obsolescence speeds up, 'an organised sloughing off of the past' is necessary to support a growth strategy. Teece et al (1997:516) define dynamic capabilities as an 'ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments'. They continue that dynamic capabilities hold significance in rapidly changing environments since they allow the firm to 'renew competencies so as to achieve congruence with the changing business environment'. Greasley et al (2007) regard competency building as a prerequisite to a more empowered workforce since employees will only be accepting of greater autonomy if they perceive their skill level is adequately supportive.

Leonard-Barton (1992) argues that capabilities are built over the longer term, this being an evolutionary phenomenon, thus very consistent with linear progression and represents accumulated behaviours, norms and values which have been shaped by past success. Herein lies something of a paradox, in that capabilities which stifle the ability to read the changing environment can become core rigidities. Core rigidities represent the 'alter-ego' of core competencies and can become so engrained that

organisations find change programmes difficult to execute. Sambamurthy et al (2003) suggest rigidities can emerge as a consequence of complacency as organisations narrow actions to those more in tune with past success. Frery (2006) agrees and cites the exponential expansion of McDonalds, Starbucks and Wal Mart as a direct result of self-imitation, however companies that indefinitely repeat formulae that have proven successful in the past, can fall prey to strategic drift (Johnson and Scholes 1998). Hyer et al (2009) suggest rigidities can become engrained as a consequence of management preoccupation with trying to make existing processes better rather than radically challenging underlying assumptions, referred to as 'status quo bias'.

Johnston (2007) asserts that a firm should regard itself as a collection of competencies and an inability to reconfigure these will inevitably fail to create 'new value propositions', referred to as 'capability myopia'. Johnston in addition relates myopia to asset specificity which refers to the inability to transfer assets from one application to another, thus compromising agility but asserts 'cognitive specificity' as potentially hazardous. Whilst asset specificity relates to production, cognitive relates to other value chain phenomena such as marketing and becomes a self-imposed restriction to development, with the author highlighting Xerox, which despite a strong innovation pipeline, refused to commercialise concepts that did not fit the core business of copiers.

Eisenhardt and Martin (2000) refer to dynamic capabilities having a significant impact on the ability to establish competitive advantage but argue it is the configuration of these which is important since capabilities per se tend to be consistent across organisations. Sambamurthy (2003) suggests capabilities are distributed heterogeneously across firms and this poses an interesting parallel with agility to the extent that agility facets may demonstrate consistency but the relative importance of these, diverse, consistent with the views of Sarker et al (2009). It follows that dynamic capabilities, referred to by Teece et al (1997) have an important role to play in agility. Dynamic suggests an inherent ability to regenerate capabilities to allow the organisation to remain in step with the changing environment and the authors identify several nuances. The first being organisations enjoying a significant cost advantage over rivals have a diminished need for agility since their fortunes will be more driven by aggregate demand than competitive manoeuvring, echoing the views of Hormozi (2001). The second is that in sectors where there is a fine balance between competitors (the authors cite Pepsi/ Coke) manipulating competitive factors will gain prominence. Eisenhardt and Martin (2000) link dynamic capabilities to alliances and acquisitions which often

enhance the skills base but sound a cautionary note around the often neglected issue of coherent exit strategies once efficacy has expired.

Cohen and Levinthal (1990) suggest most innovation is derived from adaptation of existing knowledge rather than radical invention. At a fundamental level, prior knowledge can include basic skills and learning but this carries significance since prior learning influences a firm's ability to recognise value in new information, a phenomenon known as 'absorptive capacity'. According to Cepeda-Carrion et al (2012), absorptive capacity consists of two dimensions – potential and realised. Potential is concerned with the capacity to build and assimilate knowledge, with realised being the leverage or exploitation of this. Whilst potential requires an organisation to be change-ready and flexible this does facilitate expansion of the knowledge base and it is this that allows the firm to develop solutions more effectively. Potential informs realised absorptive capacity which is contingent upon control and stability but ultimately reinforces innovation. The authors warn that managers, during times of scarce resources, tend to focus heavily on 'potential' to assimilate knowledge with a corresponding weakness in the need to leverage this for commercial means (realising).

Cohen and Levinthal (1990) regard a firm's absorptive capacity to be contingent on, though not exclusively dependent upon, the collective capacity of the individuals residing the organisation. Cepeda-Carrion et al (2012) offer a more incisive view that absorptive capacity depends on those within the firm 'at the crossroads of the firm and the external environment' which appears to resonate with the views of Christopher and Towill (2000) but Mason-Jones et al (2000), Greene et al (2008) agree that agile capability is facilitated by those positioned nearest the customer (external environment) with Shalit and Yaniv (2011) regarding this as particularly pertinent to dynamic environments since constant change means organisations must adapt continuously, with adaptability building experience within the organisation and consequently cementing change capability. This view is reinforced by the CIPD (2011) who posit that agility is closely associated with building capabilities, both at an individual and team level, which are needed to moderate the demands placed upon the organisation by changes in the environment. Carneiro (2000) suggests the involvement of the individual will determine the extent to which they deepen knowledge or acquire new skills, a view that, whilst relevant to absorptive capacity, was considered in the context of a knowledge management journal. Although Cohen and Levinthal's research predates the concept of agility, the importance of being able to interpret external factors was considered by Tilton (1971). Cohen and Levinthal also support the

views of Bower and Hilgard (1981) that prior knowledge enhances learning, through linkages to past experience. The authors regard absorptive capacity as cumulative and as a consequence firms can experience 'lock-out' where emerging ideas are too distant from the existing internal knowledge base. The connection to the external environment does need to be balanced with an internal perspective since dominance on one aspect will be dysfunctional. Moreover, this needs to be augmented with knowledge transfer across functions, which supports the views of Goldman et al (1995).

Thus, in unpredictable environments, a diverse learning base increases the probability that new information will relate to that previously assimilated. This carries relevance for agile organisations since according to Walsh et al (2007), continuous learning is a prerequisite for the agile enterprise. Dove (2001) relates agility to absorptive capacity with the suggestion that as the enterprise becomes more adept at agile behaviour, there is a corresponding decrease in the disruption experienced to reach an optimal level where agility incurs no cost or time and is no longer a barrier to pursuing opportunities and innovating. This view is supported by Haneberg (2011) who uses a tennis analogy to suggest that practicing a variety of shots, on a mixture of surfaces and against differing partners, prepares players for unsuspected challenges. However the author's own definition of agility considers this to be 'consistently adaptable' but without a fundamental need to change. This latter point appears misplaced since capacity for change seems to be integral to the concept of agility as suggested by Dyer and Shafer (1998), Van Oosterhout et al (2006) and Branson (2008). Moreover the CIPD (2011) refer to agility being 'change-readiness' which has an implicit connotation of response (change) capability.

Given that the agile organisation needs to continually develop competence to stay in tune with the environment and assimilating information is important to achieve this, the ability to exploit information would appear to be the arbiter of whether information and learning actually results in agile capability.

Exploiting information (responding)

Giniat (2011:142) refers to Business Information (BI) which relates to acquiring and processing data into 'insightful and actionable information' and this enables workers to make timely and effective decisions and more colloquially is concerned with allowing the right people to make the right decisions using the right information. One typical problem identified is that key performance indicators (KPIs) tend to be consistent across

industries but analytics should be idiosyncratic to each organisation. Whilst the importance of insight is undoubtedly a key enabler for the agile organisation, the article focusses on financial metrics and is specifically related to the healthcare sector. Glenn (2009) suggests the modern organisation needs to demonstrate an ability to transform information into insight in response to changes in the competitive environment and this is integral to sustainability.

Barney (1991) relates knowledge management to the 'resource based view' of the firm which holds that competitive advantage is derived from valuable and difficult to imitate resources with knowledge being a primary resource. Carneiro (2000) suggests a direct linkage between knowledge and keeping in step with the external environment but the benefit of knowledge is more obvious in 'innovative' industries and cites software, financial services, health care and pharmaceuticals as particular examples where knowledge has a direct influence on creativity and competitiveness. Kalling (2003) supports the view of Spender (1996) that knowledge is a mediator between unexpected developments in the external environment and firm performance and this is incumbent on senior management. Damanpour (1996) agrees, and relates information to environmental uncertainty by suggesting complex and rapidly changing environments heighten uncertainty and this intensifies the need for decision making to be made using more information. Dove (2001) takes a different stance suggesting the more turbulent business environment is itself as a consequence of knowledge acquisition changing faster than business can.

Han et al (1998) regard continual information gathering as a cornerstone of a 'market orientation' strategy which galvanises workers across functions to meet three behavioural components – customer orientation, competitor orientation and cross-function co-ordination. Kalling (2003) additionally decomposes knowledge into three dimensions – knowledge development relating to extending the knowledge base, either through new knowledge or wider distribution, knowledge utilisation which overlaps development, driving modification or improvement, for example leading to efficiencies, whilst knowledge capitalisation is concerned with how learning informs profit.

Carneiro (2000) also believes the value of knowledge increases over time but much of the time intellectual capital remains undetected, and therefore undermanaged, by senior management and undervalued by financial analysts which would appear paradoxical. Kalling (2003) whilst acknowledging the body of literature on knowledge management, suggests firms have difficulty in translating this into improved performance and this he

posits might be as a consequence of a surfeit of research on knowledge creation and organisation, but less on materialisation. This would appear consistent with the view of Dove (2001) who considers knowledge management to be a 'push and pull' (teaching is a push transaction and learning is pull) phenomenon such that knowing who possesses knowledge is no more valuable that knowing who needs it, this being particularly acute when organisations are in their infancy when a culture of collaboration is less clearly defined. According to Roper et al (2010) the efficacy of innovative capability within the firm is determined by 'knowledge transformation', which is the efficiency of how a firm translates knowledge into innovation but implicit within this is an ability to absorb external knowledge.

Dove (2001) regards agility as a derivative of both an ability to act coupled with the intellectual capability of finding issues to act upon, which reinforces the scanning and responding dimensions posited by Sambamurthy et al (2003). Dove relates this to organisational size to the extent whilst agility has two dimensions (scanning and responding), small organisations may be adept at rapid response but will often lack the scanning capability of larger counterparts. Dove also alludes to the symbiotic relationship between dimensions since knowledge is not value-creating until it is used to effect change.

Sambamurthy et al (2003) relate knowledge acquisition to scanning and responding capabilities by suggesting that proactively sourcing knowledge from multiple channels (scanning) and being able to respond to this can positively influence firm performance. This would appear to echo the views of Zaheer and Zaheer (1997) who contend that profit opportunities are determined by an organisations ability to generate rents (Kay 1993) on the basis of superior private information. This is predicated on the firm's information networks and responsiveness which is distilled into two important capabilities, the first being alertness, or the way in which firms manipulate their information networks to gather superior private information. Second is responsiveness which permits organisations to acquire information as a consequence of changing environmental signals.

Khalifa et al (2008) draw on previous studies (Sambamurthy et al 2003) to illustrate the positive impact of KMS on the areas of agility and innovation. The authors draw on contingency theory to suggest agility and innovativeness mediate the effects of KMS on firm performance. The research conducted by Khalifa et al (*ibid*) was based upon one hundred Chinese organisations where manufacturing predominates and the authors

acknowledge (p128) that some of the outcomes might be influenced by cultural phenomena. The findings were that KMS has a more significant impact on agility outcomes (30.8%) than innovativeness (21.9%) in China and this carries some (population) validity across the Asia-Pacific region, contrasting with North American and European firms which are more likely to use KMS to drive innovation. Whilst Khalifa et al postulated that the cultural impact on agility might be idiosyncratic, it is worth finishing the literature review with this, although in keeping with the imprecise definition of agility, culture too appears nebulous and thus difficult to quantify.

Culture

According to Branson (2008) organisational culture is a reflection of values, leadership styles, language and symbols, procedures and routines that combine to bring uniqueness to the firm with the influence of culture being evident whenever people are united to satisfy needs. Dove (2001) suggests the cultural framework equates to the ties that bind people together and this helps retention of compatible employees and rejection of those who are not. This concurs with the views of Cartwright and Cooper (1993) who position culture as a cohesive force which helps to define behaviour within the organisation. In the context of change and uncertainty, culture is the arbiter for reconciling internal and external efforts to the extent that internal culture has to balance with the exterior of the firm at both and individual and collective level.

Alves et al (2012) relate culture to agility by suggesting the organisation should nurture ‘thinkers’ rather than ‘doers’ and defines this as people who are sufficiently able and motivated to make suggestions for improvement. The authors do acknowledge the difficulty of moving traditionally task oriented workers to ones more reflexive. This is consistent with the views of Goldman et al (1995) that workers need to rationalise what they are doing. It also mirrors the CIPD (2011) who stresses the importance of behaviours to the extent that values and behaviours need to be aligned to support business-critical activity. Branson (2008) continues that value alignment is an intrinsic part of a cohesive culture where employee motivation is dependent upon compatibility between personal values and those within teams or the wider organisation. This is because groups are assembled from individuals who each bring their own value-base which is often subliminal, yet when groups are formed, no collective value-bases exist meaning they can only emerge if individuals within the group personally embrace a new range of values emanating from within the group.

The important issue here, according to Branson (*ibid*) is group or organisational values can be conceptual only unless individuals consciously choose to align with them. Trompenaars and Hamden-Turner (1997) suggest culture is shaped by leaders and employees and three elements of structure which determine corporate culture:

1. The relationship between employees and the organisation
2. The hierarchical arrangement which defines authority between managers and subordinates
3. The extent of 'buy-in' from employees around the organisational direction and their place within this

Buono et al (1985) regard culture as organisation specific, containing objective and subjective elements and is a powerful determinant of group and individual behaviour since it epitomises traditions, shared beliefs and expectation of life within the organisation. Harrison (1972) identifies four distinct cultural groups:

1. Power culture which is often evident in smaller organisations and is typified by a central source of power connected to functional teams but with control centralised and responsibility resting on individuals rather than committees. Power cultures impose high levels of constraint on individuals, with limited participation or consultation and thus are often regarded as oppressive
2. Role culture places importance upon functions or specialist teams with the interaction influenced by procedures and policies. They are often characterised by a dominant central power-base and in this respect share similarities with power cultures, making the organisation unresponsive to environmental change and susceptible to myopia
3. Task culture is team or task oriented, seeking to configure cross functional teams for specific projects meaning power is widely dispersed and workers more autonomous. This culture is adaptable, with teams assembled and dissolved rapidly making the organisation responsive to changes. Task culture fits the agile model extremely well and it is suitable where the market is competitive, life cycles are short and where speed of response is important. Control is more problematical and operate optimally in conducive environments but become dysfunctional in adverse conditions as managers compete for resource and top management are tempted to interfere

4. Person culture tends to be less prevalent, and is concerned with serving the individuals within it meaning a minimalist structure and where the interests of the organisation are subordinate to those of individuals within

Handy (1976) reinforces the view of Harrison but further suggests as firms evolve their dominant culture will similarly change, with most organisations starting as power cultures due to the dominant influence of the founder, but as the firm matures and there is a recognition that the dominant figure cannot oversee all aspects of the business, a role culture emerges. Thorpe et al (2011) regard the traditional view of overtly influential leaders as being rooted in an individualistic paradigm (Parsons 1951, Hofstede 1991) but a fundamental shift to actions or tasks implies leadership is extended across the working population (distributed leadership) to shape successful outcomes. Bolden (2011) suggests a number of reasons for this which resonate with the agile organisation, such as cross-functional teams, speed of response and information access. Trompenaars and Hampden-Turner (1997) posit that corporate culture is manifest across four dimensions which are fully consistent with the task/ person and power/ role relationship devised by Harrison (1972), although the authors caution that this should be seen only as a means of distinguishing between corporate cultures since over-reliance can lead to stereotyping with the reality being that whilst within any given culture there is a set of dominant traits, cultures are not static and may transcend axes temporarily. Graphically the four dimensions are derived from two axes egalitarian/ hierarchical and person/ task which mirror the power/ role and task/ person extremities identified by Harrison (*ibid*).

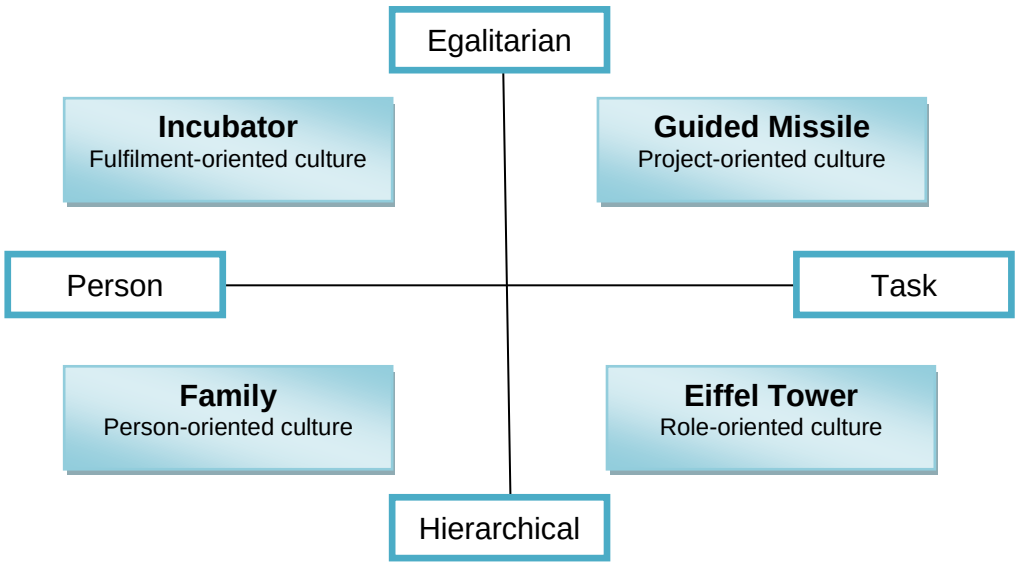


Illustration 6 Corporate Images (Trompenaars & Hampden-Turner (1997:159)

The corporate images model has distinct resonance with agility. Family cultures which are often associated with nations which industrialised late, such as Italy, Japan, South Korea and Spain are characterised by strong relational bonds meaning monetary reward tends to be less important than praise and recognition and as a consequence efficiency (doing things right) is subordinate to effectiveness (doing the right things). The Eiffel Tower culture is characterised by hierarchy and bureaucracy, with change seen as a consequence of variation to 'rules'. Here, changes in corporate direction are contingent upon commensurate changes in employee participation. Change is often resisted or implemented late and as a consequence this type of culture does not respond well to turbulent environments, a key requirement of the agile organisation. The Guided Missile culture is egalitarian but has similarities with the Eiffel Tower model in being impersonal. Its task oriented nature is conducive to projects through teams which can be discarded and this would appear to be consistent with the multi-function teams as agile enablers advocated by Goldman et al (1995). The Incubator culture is predicated on the belief that the organisation is merely a conduit for the fulfilment of individuals. Very little structure is evident in Incubators which are very strongly associated with design and innovation, in common with the agile enterprise, but the model typically fails to adapt to changing demand and thus struggles to reach maturity and this may help to explain the reason innovators fail to appropriate the benefits of their creativity (Kay 1993).

Ogbonna and Harris (2002) consider organisational performance to be determined by the alignment of corporate strategy and employee values. Here there is evidence of cultural homogeneity in common industries, referred to as 'macro-culture', which lead to convergence and means differentiation is elusive, but this is compensated by collective learning and provides industry participants with a means to orientate strategy. Branson (2008) draws on research by Barney (1986) who asserts organisations that are successful in driving improved productivity tend to have a culture which supports and values employees. In considering the link between culture and firm performance, Ogbonna and Harris assert that competitive advantage is conferred not just by cultural 'strength' but by the rarity and adaptability of cultural traits which would appear consistent with the notion proposed by Reed and DeFillippi (1990) that sustainable competitive advantage is predicated not only on competence but difficulty of imitation.

According to Jacobs (2010), despite markets becoming more global, this homogeneity masks significant cultural differences. This view is echoed by Davis et

al (2010) in the context of adapting rapidly who highlight in particular the importance of cultural diversity which plays a major part in the perception of speed. The authors highlight the preoccupation of American industry with speed, often at the expense of quality and this seems to contradict the views of Goldman et al (1995) who suggest a quality/ speed trade-off is just not sustainable in the new paradigm. The issue of cultural difference is particularly acute in the case of mergers or alliances according to Cartwright and Cooper (1993) to the extent that the degree of cultural compatibility between organisations is directly correlated to success of the partnership. They continue that firms with an established and successful culture often find difficulty in transferring this to partner firms or acquisitions which can result in low morale, poor quality and ultimately declining financial performance. This appears particularly relevant to the agile form given the importance placed upon the use of partnerships (Maskell 2001).

The five-point relational model (Penrose 1951) in Tompenaars and Hampden-Turner (1997) would appear to have a high degree of resonance with the extent to which an organisation can be expected to fulfil agile capability. In the case of individualism/ communitarianism, decision-making is often more protracted since there is a tendency to achieve consensus before decisions are made and this creates a major impediment to agile capability where decisions need to be made rapidly and near the customer interface. According to Trompenaars and Hampden-Turner (*ibid*) North American and North-West Europe typifies the individualist culture where decisions are often encouraged by the individual, fully consistent with an agile ethos.

Summary

The origins of agility lie within the manufacturing sector with later adoption into services and components of the value chain but there appears to be virtually no evidence of application within the not-for-profit, such as public or charitable sectors. This seems to coincide with the shift away from mass production to customisation but implicit within this is a cost, since robust scanning and response capability demand adequate resource, meaning agility should be seen as a way of better serving customers as opposed to reducing or eliminating costs.

There is no shortage of definitions in relation to agility and most form a consensus that agility is concerned with being able to respond to changes in the operating environment, with change being defined by the level of predictability or the scope of

the change in relation to the starting position. There is also an acknowledged view that agility consists of a number of characteristics which appear to be organisation or industry specific but there is no uniform acceptance of just what such characteristics might be. Goldman et al (1995) attempt to define a taxonomy which consists of four 'pillars' (customer, structure, co-operation and people) and most of the literature does appear to fit logically within these. Whilst Goldman et al do not present a model to encapsulate their views on agility, Kidd (1994), who also considers agility from a manufacturing standpoint, presents a simple model where agility is supported by three pillars, which shares nuances with Goldman et al – organisation, people and technology. Whilst the model appears obsolete, it does acknowledge agility is delivered by a unique combination of all three elements. This model is presented below but in chapter six, I present an updated and enhanced model for agility based upon my findings.

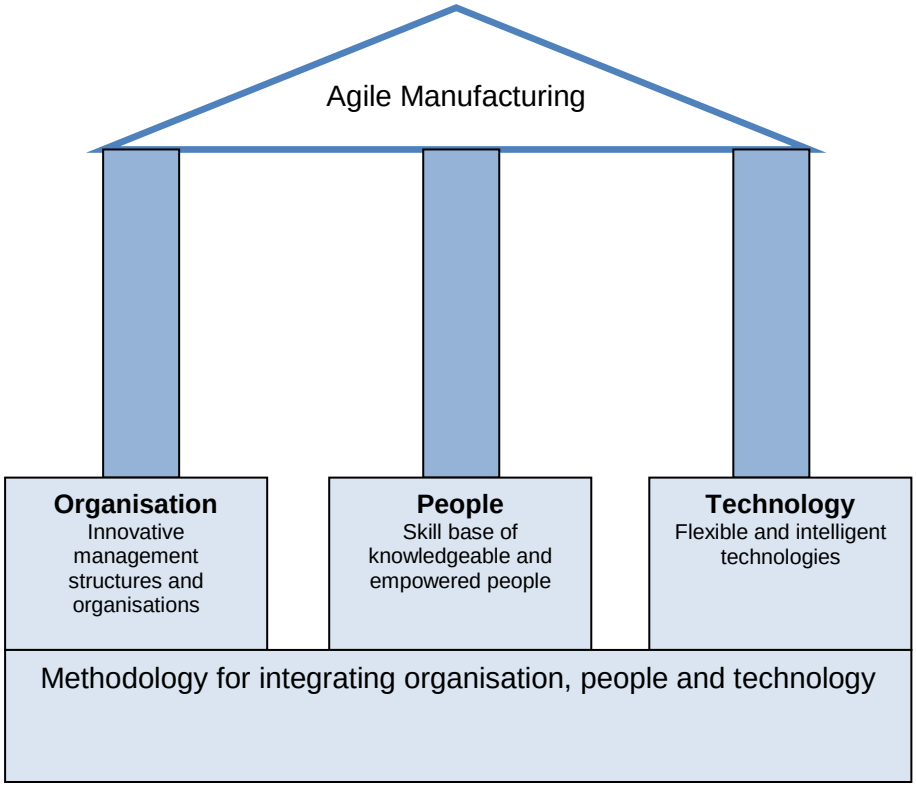


Illustration 7 The structure of agile manufacturing enterprises (Kidd 1994:11)

Fundamentally agility appears to rest on the ability to scan the environment for impending change signals and respond to these, with large organisations displaying strength in scanning, but weakness in response and small firms being the alter-ego of this. A firm regardless of size, with agile ambitions does need to develop capability in both areas. It is evident from reviewing the literature that since the four 'pillars' developed by Goldman et al in 1995, the understanding of the phenomenon has

advanced and as a consequence the number of traits which might be necessary for an organisation to become agile has broadened. This research aims to identify the necessary characteristics and categorise these as a 'best fit' into one of the four pillars.

Customer

One of the defining elements of agility is customer centricity with firms needing to provide complete solutions rather than products or services in isolation. Within larger firms this is achieved through the deployment of small teams drawn from various parts of the business, the corollary being that in small organisations lacking scale economies, solutions are provided through networks. Innovation appears to be an integral part of agility but there is divergence between the perception of this within the manufacturing and service sectors, with innovation being less tangible and associated with sustaining (gradual) innovation in services but manufacturing characterised by more tangible and disruptive innovation.

The end of the mass production era has given way to one of mass customisation where firms need to be able to provide customised solutions, regardless of order size and this appears to be the defining difference between an agile firm and one that is 'lean', though it is evident that agile and lean can coexist within the same organisation with support activity being efficient (lean) and agile being more important at the customer interface. The customer element of agility also appears contingent upon the use of real-time information and the ability to respond to it, this being intensified in high velocity markets where knowledge becomes obsolete more quickly.

Structure

Configuration theory suggests the design of an organisation will affect the extent to which it can attain competitive advantage, with the theory resting on four imperatives (environmental, structural, strategic and leadership) which are consistent, though not entirely reflective of the four pillars posited by Goldman et al (*ibid*). Whilst organisations are idiosyncratic, only a few credible configurations exist, since the market is highly efficient at eliminating those which lack efficacy. Agility clearly carries connotations of speed but Zaheer and Zaheer (1997) are more granular that it is speed of response to information that creates competitive advantage through

'causal ambiguity' (Reed and DeFillippi, 1990, Johnson et al, 1998). Speed of response is contingent upon the value chain as agility will remain elusive if the component parts of the chain do not have goals aligned to the common objective.

The issue of agility is strategic in nature, though Van Assen (2000) regards this as being operationalized near the customer, with the extent of control exerted by top management and rigidity within the hierarchy having a marked impact. Trompenaars and Hampden-Turner (1997) suggest contingency theory to explain how hierarchies can survive in stable conditions but since agility is concerned with turbulence, flatter structures are necessary, a view echoed by Goldman et al (1995). Rohbeck (2010) suggests dealing with incremental and radical change patterns requires contrasting capabilities but the structure of an organisation with agile intentions needs to support both change patterns, and additionally change of an unpredictable nature, with the latter appearing from the literature to be the arbiter of what makes an organisation agile.

Co-operation

The essence of agile behaviour should be for the firm to be more in step with the external environment, with the need for agility being more acute in dynamic or rapidly changing environments. The determining factor for whether a firm is agile or not appears to be a capability to respond effectively to change of an unpredictable nature and this seems to be the differentiator between agility and flexibility, with the latter more concerned with change within predefined parameters. The corollary here is that those organisations which typically lack efficient sensing mechanisms risk suffering myopia. This change requirement would appear to divide opinion but with the majority (Vokurka and Fleidner, 1998, Maskell, 2001 for example) suggesting demand side issues tend to shape the need for agility, which is juxtaposed to shortening product life cycles with an inevitable requirement for firms to serve their customers more rapidly (Van Hoek et al, 2001).

The importance of co-operation to agility is embodied within the literature by the use of alliances on the premise that no one organisation has all the requisite skills to meet the demands of all their customers, all the time (Kidd, 1994, Van Hoek et al, 2001). Such partnerships are often assembled at short notice, with no formal legal basis and disbanded equally abruptly, though a heavy caveat exists according to Gari (1999) and Chrsitensen et al (2011) around the high failure rate for alliances.

People

The configuration and development of people appears to be a major influence for the agile organisation with workers that are enabled through learning and empowerment being key themes. This appears to be reflective of the view that agility should be manifest at the customer interface to the extent that enabled workers can make decisions quickly in keeping with dynamic change patterns, and additionally there appears to be strong linkage with innovation to the extent that rigid organisations which do not enable staff, act as an impediment to innovation and creativity (Damanpour, 1996). Empowerment is ultimately symptomatic of a motivated workforce, with factors such as responsibility and enrichment (Quader and Quader, 2009) being self-generated or intrinsic motivators, but this needs to be supported by a reward scheme that clearly articulates the organisation's goals and structures reward around scanning the environment and response to change signals.

Although there is limited evidence of a linkage between agility and distinctive capability, the ability to develop a wide range of competencies appears very congruent on the basis that rigidities lead to a disconnect with rapidly changing environments, whereas continued development of competence in the form of absorptive capacity (Cohen and Levinthal, 1990) mean an expanding skills base reduces the probability of change being too distant from capability within the firm.

Whilst the evidence within the literature that directly links agility to culture was limited, there does appear to be a strong intimation that agility needs to be manifest within the organisational culture, or more precisely that certain cultures, for example the Eiffel Tower culture posited by Tropmenaars and Hampden-Turner (1997) simply will not support agile behaviour and this might help to explain why certain organisation stereotypes or even national cultures might be more or less predisposed to agile characteristics, though in the case of the latter this will be explored more in a subsequent study.

The literature has been evaluated based upon the categorical split posited by Goldman et al (1995) but augmented by more recent research and this theme will continue in chapters 4 and 5 with the four pillars being the lens through which data is presented (Ch 4) and analysed (Ch 5). Chapter three looks at the methodology used and sets out how the study evolved from quantitative to a mixed methods approach. Given the bias in previous studies being within manufacturing, this chapter sets out my

motives for testing the importance of agility on service based organisations, and just as importantly comparing agile capability across private and public sector organisations where there is a gap in the literature. It is also evident that very few attempts have been made to quantify or measure agility so chapter three aims to provide some detail about how I approached the design of a measurement tool and how this was piloted.

Chapter Three

Research Methodology

Introduction

The original aim of the study was to devise a means of measurement as a platform for a longitudinal programme but as the study developed, it became apparent that agility is complex in nature and lacks consensus on just what is needed for a firm to be regarded as agile. Moreover, one of the organisations taking part in the study had a stated objective to become more agile, but had no clear indication of what they might be doing differently as a result. This chapter starts by building on this theme with a look at the dilemmas I faced as the study advanced and how I tried to overcome these. Significant gaps exist in previous research around how agility is characterised and whether it can be quantified to allow comparisons to be made across sectors so the next part of the chapter discusses how the research objectives aim to bridge these issues. I build on this by highlighting more specifically how the survey addresses the measurement issue and the interviews aim to develop a deeper understanding of the phenomena. Access to organisations was not without its challenges so these are considered next, before moving onto operationalization through design, piloting and scaling the study. The chapter concludes with a reflective section which uncovers the inherent ambiguities within the study and how I tried to rationalise these.

Whilst it is accepted that organisational agility has its foundations in the manufacturing area, previous studies have been restricted to elements of the value chain within a single industry or company, been confined to manufacturing or conducted within one country, there is no evidence of multi-industry or cross border comparisons having been tested. Despite attempts to quantify agility (Yusuf et al 2003, Vazquez-Bustelo et al 2007), no evidence has been found of a longitudinal study with a stated aim of attributing measurement to agility.

When considering the basis of organisational agility (its epistemology), the fundamental question is what distinguishes true from false knowledge (Heylighen 2000). This can be viewed from an absolute (static) position of knowledge or relativity-based which considers knowledge as adaptive and dynamic. Heylighen

(*ibid*) suggests a baseline position of considering universally held ideas or beliefs but in the case of agility this seems to lack pertinence due to the disparate nature of the literature and a genuine paucity of knowledge of the phenomenon by interview participants. This raises the question of the criteria for fulfilment of when an individual knows something to be the case, posited as 'justified true belief' (Gettier, 1963 in DeRose 2005). Thus when considering whether the concept of agility is adequately supported by evidence, there was a materially different starting point between myself and the participants in the study since mine was influenced undeniably by the body of literature. This appears to embody the two dimensions to epistemology – internalism and externalism. Internalism considers knowledge primarily focused on factors internal to a subject's viewpoint or to which they have access and it is these which determine whether true beliefs constitute knowledge. Most accept that the matter of whether a belief is true to be the arbiter of what constitutes knowledge, which is supported by Cunliffe (2002) who suggests social reality is created by our everday interactions and making sense of what is happening around us occurs as a consequence of dialogical practice. Externalism regards the justification as how the belief was caused and how reliable the mechanism was for acquisition of the belief. This conflict is highly evident within the study so the next section looks at some of the dilemmas I faced around the ontological nature of agility.

An outline of research dilemmas

According to Babbie (1986: 6) methodology is 'the science of finding out' and as such is the 'philosophical and theoretical underpinning of research' which shapes the choice of methods for evidence gathering. Blaxter et al (2006) suggest the emergence of a more naturalistic and subjective approach has divided social science. Pragmatic epistemology exists in the form of models that represent the environment in a way that facilitates problem solving with an inherent assumption that no one in isolation can capture all relevant information due to sheer complexity associated with such a utopian model. This is reflective of the subjective and disputed nature of agility and the social sciences in general.

The original aim was to devise a means of measurement but I feel whilst this would deliver a basis for a longitudinal study, it would be one-dimensional and not further the understanding of the phenomena. This creates a tension within the study because as more literature was uncovered it became apparent that agility is complex in nature with many component parts. Additionally organisational agility is subjective

and lacking consensus with very diverse views. Thus by adding a qualitative element to the study I was able to test consistency with the survey and gain a more granular insight into how the phenomenon is understood within organisations. Blaxter et al (*ibid*) identify a number of ways in which quantitative and qualitative techniques can be combined, referred to as 'mixed methods'. One is to build a general understanding where it is felt one technique in isolation is not able to accomplish this with the authors unequivocal in their view that qualitative evidence facilitates 'generalizability'.

Pragmatic epistemology does not clarify where knowledge or models emanate from but implicitly acknowledges they stem from other models and empirical data acquired through heuristic techniques, fully reflecting the basis of this research. The alter ego of pragmatic epistemology, according to Heylighen (2000) is constructivism which assumes knowledge is built from grounded theory which means no empirical data, baseline models or cognitive categories and this creates an issue of relativism where any model is seen as equally valid and thus distillation of true knowledge from false is futile. This view can be reconciled by individual constructivism which assumes as individuals we reach coherence across varying knowledge bases with the result that we reject those incongruent with ours and those which help integrate previously incompatible concepts will be maintained. This mirrors my own position in relation to the study to the extent that the diversity of literature I covered during the formative part of the research did serve to broaden my cognitive base particularly relating to agility components to the extent that almost everything appeared relevant. Seymour and McCabe (2007) suggest the role of the researcher should be primarily to elicit how participants theorise, contextualise and align values within a given setting and to record this accurately, fully cognisant that researchers will hold opinions but to recognise their impact on the setting. Social constructivism is concerned with consensus between subjects as the major determinant of knowledge, with truth determined by those concepts on which the majority of a social group agree. This is also relevant to the agility study, in relation to the interviews since the key elements defining agility are those most frequently cited by the interviewees. This caused me to question the knowledge bases of the individuals concerned and how to reconcile any differences with the perceived wisdom from the academic literature.

According to Denzin and Lincoln (1998) constructivist and interpretivist are loose general terms for methodological persuasions which suggest a general direction of enquiry, rather than finite descriptions of what might be found. Advocates of these suggest understanding of complexity is distilled from the views of those that live it but in

the case of agility, meaning is interpreted differently by those who use it. Constructivists ascribe to the contrary opinion that what we see as objective knowledge is a question of perspective, meaning knowledge is created as opposed to discovered. As the study developed, I came to see myself take on a more 'constructivist' stance meaning, whereas the formative part of the research the literature served to embed my mental perspective of agility, the interviews helped me to construct a different concept of the phenomenon which adapted as a result of the emerging views and experiences of practitioners. This mirrors the views of Goodman (1978) that researchers experience many versions of the world and as such there is not one solution that is 'ready-made'. Instead I started with a particular view of the world but consistent with the views of Goodman (p6) 'the making' became a 'remaking' and one that is materially different from my original frame.

Easterby-Smith et al (1991) consider the two primary philosophies, phenomenology (interpretivism) and positivism each of which has become regarded as a stereotype, mostly by advocates of the opposite philosophy. Positivism holds that the social world exists externally and can only be understood through objectivity rather than through subjective methods such as intuition or reflection. Blaxter et al (2006) regards positivism as an approach to research which seeks causal explanation, or 'eklaren', through control and predictability and suggest positivism has historically been dominant in understanding the social world which has become the 'received view'. Bowling (2002) balances this view, citing a risk of conclusions being drawn from artificial facts without the underlying appreciation of the significance of meanings attached by individuals. Easterby-Smith et al (1991) suggest positivism is useful in confirming what is already known but not conducive to formulating theories since it is typically concerned with measuring the past or present and this creates difficulty in shaping the future

Phenomenology emerges from the view that the social sciences are not objective but are socially constructed and given meaning by people (Husserl 1946). It differs from positivism on the premise that the role of the social science should not be to gather data and apply measurement but to build an understanding, or 'verstehen', of the meanings people attach to experiences and in doing so attempt to understand how these differ across individuals. Denzin and Lincoln (1998) refer to the understanding of the 'meaning' of social phenomena, but argue it is broader than simply the subjective nature of people and needs to reflect the 'intersubjective nature of the world' and the complexity of recognising actions of people as being significant. In

considering phenomenologist approach, Easterby-Smith et al (1991) suggest that the advantages in some way are symmetrical to the positivist position and so provide the ability to collect data in a natural as opposed to artificial manner and using this to generate insight into meaning which is conducive to generating new theories, this being iterative since research can be adjusted to new ideas as they emerge.

Seymour and McCabe (2007) identify the difficulty of establishing 'truth' through objective research which identifies causal relationships leading to factual data which aims to enhance understanding, this being prevalent in the natural sciences where scientific measurement yields 'stories about'. The authors highlight incongruence between such relationships and how such phenomena are understood and discussed by practitioners or industry players since 'stories about' are invariably judged by and discussed within academic circles but not necessarily practitioners, leading to inconsistencies between academic interpretation and reality. It is argued that academic research should be regarded as an attempt to influence and as such the role of the researcher needs to be acknowledged. This carries significant relevance to the agility study since designing a means of measurement based upon academic literature, whilst fulfilling the requirements of the original aim of the study could be significantly distorted from social reality with a dichotomy between academia and the perception of agility within industry.

Advancing Meaning Using Abduction

The essence of the study, particularly as this evolved, was to reflect on the word 'agility' since the definition is not clear-cut, with no ontological determinant but instead it is inferred by a complex network of characteristics. Whilst attempts have been made to define agility, with an acknowledgement that it is an amalgam of characteristics, many of these themselves lack precise definition, for example leadership, motivation and culture. This created a conundrum for me because without a clear consensus on what they mean, trying to assign measurement seems equally fatuous. This was a major motivator in extending the scope of the study to include interviews with industry practitioners and gain insight into the social reality of the phenomena to try and understand what people feel they should be doing when performing agile behaviour, consistent with 'stories within' posited by Seymour and McCabe (*ibid*).

Geertz (1973) opposes the view that there is a world of facts to be observed, analysed and recorded but instead the researcher should search for meaning, and he especially highlights the futility of a methodology which reifies the world of experiences. This appears to isolate one of the clear inadequacies of using purely deductive techniques in connection with agility, which appears amorphous in nature. Denzin and Lincoln (1998) additionally identify the difficulty with bringing a determinate meaning to phenomena when the line of enquiry is through actors and particularly highlight nebulous or emotive issues such as art, religion or language. This draws very clear parallels with agility which lacks tangibility and given the prevalence of dilemmas and conflicting information, calls into question the extent to which it can ever truly be defined, which lead me to an abductive philosophy.

Abductive techniques result in interpretive knowledge based upon some context of observation where validation is related to the context where it originated by asking if resultant theory makes sense of experience. Svennevig (1997) argues that many scientific programs cannot be resolved through purely deductive or inductive methods and considers the inference from initial uncertainty to a hypothesis which may provide explication. The author explains that deduction leads to conclusion through necessity but is not productive because it lacks contextual input. Induction however involves generalisation through inference. Abduction provides reconciliation by inferring a case from a rule and result but, like induction, it provides probability rather than conclusiveness. Svennevig refers to Peirce (1998:216) who suggests abduction is ‘the process of forming an explanatory hypothesis’ or an ‘inference to best explanation’ to generate new learning but is productive as it considers contextual views. Abduction is compatible with the social sciences where observations are moderated by behaviour which is material and is influenced by context.

Abductive enquiry is pragmatic and starts with an unexplained or suprising fact which provides a catalyst for a hypothesis to explain the fact. Since this is a way of arriving at the most plausible explanation, abduction is a creative process. In the context of this study the issue of devising a means of measurement in isolation appeared to me to be akin to using a natural science methodology to overcome an issue that is more social in nature. Abduction helped me to bridge this, allowing me to make sense of the data I collected. It is apparent agility, whilst contested, is a complex web of characteristics that create a possibility of an infinite number of explanations which makes arriving at a ‘truth’ problematic, but according to Denzin and Lincoln (1998),

truth is a best-informed construct based upon consensus at a point in time. Thus, I have attempted to use abduction to arrive at the most plausible hallmarks based upon data collected.

The issue that what is observed relates exclusively to the idiosyncratic circumstances or conditions prevalent at the time of observation, is highly relevant to this study since agility appears to be situation-specific. Additionally firms participating in this study lack clarity as to how to define it and just as importantly, find it very difficult to articulate when they are doing it. The paradox here is this supports abductive enquiry since abduction is inferential and aims to preference one hypothesis over others, as long as this is not based upon a priori knowledge which influences selection or testing. In the case of this study, interview participants were chosen only if they elected to participate following the survey, they were asked to express views and opinions around what they thought made a firm agile and in the case of MH, what they thought they would do differently. Thus the word-patterns used in Chapter Four aim to 'tell a story' but suppression of my own views seems fatuous since without these I would have no insight as to what might be relevant or meaningful. Moreover, Denzin and Lincoln (*ibid*) acknowledge disengagement of the observer simply is not possible in arriving at constructs.

Svennevig (1997) refers to three requirements as a route to selecting the most plausible hypothesis. The first being an explanation of the facts meaning it should account for 'concrete, observable phenomena' but differing from the positive stance of a mere description. The second refers to a requirement for economy in testing and this can be measured by lower cost, improved efficiency or reduced complexity. The final requirement is that the hypothesis should be capable of testing including inductive and deductive techniques. Peirce (in Vennevig, *ibid*) refers to 'gentle forces' which are inconsistent with prediction but instead leads to principles rather than causes. In terms of context this gives rise to a three stage process of research starting with abduction (agility is characterised by traits idiosyncratic to each organisation), followed by deduction (measurement using the Corporate Agility Matrix or CAM) and concluded by induction (follow-on interviews) mirroring the sequencing in this study. Moreover this study supports Peirce's view that induction involves considering the significance of outcomes and at least some guess-work to unite what is observed.

Having explained the difficulties I encountered in framing this study, I now consider how this connects with previous work in the field and this is described in more depth in the next section.

Previous Studies

Previous studies of Organisational Agility are sector specific such as engineering (Youssef 1992), internationally focussed (Van Oosterhout et al 2006, Vazquez-Bustelo et al 2007) or a specific element of the value chain (Sarker et al 2009, Rigby et al 2000). Hoyte et al (2007) research is narrowly focussed on just three sectors (automotive suppliers, instrumentation equipment, and semiconductor components) none of which are service industries. Vazquez-Bustelo et al (2007) do attempt to approach the agility issue from a quantitative perspective (sample 1234 firms) but these are all drawn from the manufacturing arena. The authors conclude (p1323) that turbulent conditions are not restricted to the manufacturing sector and the (population) validity of the research could be tested across industries. Yusuf et al (2003) also consider agility from a quantitative perspective, but with feedback only from chief executives, which creates a potential 'view from the top' bias. Whilst top management may be in a position to assess the probability of external change, their assessment of capability in dealing with such change could be limited, consistent with the views of Jackson (1997), with those closer to the customer/ suppliers being able to provide more meaningful insight.

Van Oosterhout et al (2006) present research into agility across four sectors (Telecoms, Finance, Utilities and Logistics) within the Netherlands. They address three main areas – change factors requiring agility, agility gaps and enablers/ disablers. The authors use a mixture of qualitative and quantitative data, feeling this provides a more holistic picture. The theoretical framework is based around an assessment of a) probability of change occurring and b) the difficulty of coping with the change. Other than the study being confined to just four sectors the survey is also focussed at a senior level within the organisation.

Having identified the limitations of previous studies, the following paragraphs consider how the gaps identified in the literature have been addressed by the research objectives

Research Objectives

Sherehiy (2008) suggests many definitions of agility exist in the literature but the basic premise is one of being able to adapt to continuous and unpredictable changes in the external environment. The tenor of the methodology has been to address the research objectives and establish the key factors which determine agility, to quantify the importance placed upon these across the private and public sectors and so understand why differences exist. Shalit and Yaniv (2011) identify that agility is derived from a combination of effectiveness and efficiency, these being determined by three factors – firm size, hierarchy and age. For this reason, this study is structured around an analysis of how the importance and perception of agility differs across organisations of various sizes, managerial levels and whether the time served with the organisation has a material effect.

Whilst there is commonality around the view that agility is concerned with an ability to scan and respond to the external environment (Jackson 1997), and that agility is composed of a collection of facets (Sarker et al 2009), there is no clarity on the composition of agility nor the relative importance of the component parts in diverse organisations. Zhang and Sharifi (2000) suggest that, even within the same sector, organisations face varying degrees of turbulence within operating environments, meaning agility drivers will vary. Moreover, the degree of agility required (agility need level) is commensurate with the prevailing level of change and thus the mix of competencies required is heterogeneous. The aim of the research is to build a *testable proposition* by gaining clarity around the facets of agility, to apportion a weighting system between these which allows comparisons to be made across industries and organisational types and understand how differences might be manifest. In terms of providing a focal point, the research objectives are:

Objective 1 – To examine the existence of factors determining organisational agility

The literature suggests agility characteristics exist and are idiosyncratic to each organisation, without providing much clarity as to what these might be. To test this, a survey was conducted to determine the importance of agility characteristics drawn from the literature. The outcomes from the survey suggest some commonality around the characteristics needed to effect agile behaviour but the relative importance of these differs across firms. Agility appears to be a contested theme (Bottani 2009) so the importance of the key characteristics was tested with industry practitioners using semi-

structured interviews. Whilst understanding the relative importance of agility factors bridges an identified gap in the literature, it also has commercial application because it provides a blue-print for organisations with agile ambitions to better realise their goals, this being evident from the interviews where one organisation in particular had a stated objective to become agile, without a clear idea of what this involved.

Objective 2 – Explore ways in which organisational agility can be quantified by the development of a measurement tool

Whilst the literature fails to clearly articulate the accepted characteristics of an agile organisation, it does suggest that traits are not homogenous and that differing firms experience varying need to be agile. Moreover the literature review highlights virtually no evidence of any attempt to quantify agility in a way which would allow a means of comparison across organisations from varying backgrounds. Having identified the key characteristics of the agile firm (objective 1), the development of the Corporate Agility Matrix (CAM) seeks to quantify the relative importance of these. The design and validation of the CAM is by means of a survey across six UK organisations, two of which are from the not-for-profit sector. The development of an assessment tool brings about a greater understanding of the characteristics associated with being agile and an ability to calibrate these to identify which were perceived as the most important influencers.

Previous attempts at measurement of agility have fallen short of a single factor which can be applied as means of comparison. This study aims to make a contribution to theory by closing a gap in the knowledge base with the design and validation of a measurement tool which is dynamic in nature and allows a means of comparing organisations.

Objective 3 – Using data, verify the validity of the model

The CAM has been tested by means of a survey conducted across a range of UK service organisations and encapsulating the views of 40 participants drawn from a range of managerial layers. The measurement tool has been recalibrated in the light of responses and carries internal validity but despite the research being conducted across a range of organisations of differing size, sectors and industrial backgrounds, the relatively small sample size means the question of population validity or generalizability is likely to be modest. The tool has high levels of reliability since the model is populated

by responses from a coded questionnaire which has been tested on a sample of forty respondents. The use of a tested model tackles the combined issues of which agility traits might be most relevant to a particular organisation, can be used as a diagnostic tool to identify 'quick-wins' and allows a means of resource allocation for practitioners.

According to Rooke et al (2009), a positivist approach stems from an established body of theory, where a hypothesis is tested and leads to incremental knowledge growth. Whilst this is partly true of this study, since the literature shapes the construction of the CAM, agility appears imprecise in nature meaning finding a hypothesis as an anchor-point is egregeous. The need for complimentary research approaches in this study became evident since a purely positivist approach would fulfil the measurement criterion but at the cost of more comprehensive understanding of the phenomena. Undertaking a survey in isolation, in keeping with positivist principles around designing a means of measurement, would not deliver a thesis which articulates a greater sense of what being an agile firm involves and in this regard, interviews provide insight into what needs to happen to make an organisation agile.

Objective 4 – Using exploratory methods, examine agility from the perspective of practitioners

During the literature review it became apparent that agility is comprised of a number of facets, making the phenomenon imprecise and with that the associated difficulties of assigning measurement. Bottani (2009) highlights the imprecise nature of agility meaning it is often considered through 'fuzzy logic'. As a consequence, the study evolved into a mixed methods approach with follow-on interviews, drawn from the participating organisations and this allows me to build an understanding of the primary capabilities needed in order to be regarded as agile. Whilst this does confirm the importance of certain agile characteristics, such as speed of response, with others it merely serves to highlight the inherent ambiguities since the survey outcomes are not consistent with those from the interviews. Using exploratory methods such as interviews furthers the theoretical base by identifying emerging themes, with one in particular (risk tolerance) being highly relevant to practitioners.

Objective 5 – Present a redefined model of agility to assist development of improved practice

Goldman et al (1995) present a model of agility which has become a landmark publication and which is used by many subsequent researchers. Despite the passing of time, the basic four elements comprising agility (referred to here as 'pillars') still appear relevant to the modern organisation. It is evident that each of the four pillars are supported by a number of agility characteristics which carry significance for organisations of varying backgrounds, with the exact level of importance idiosyncratic to each, but here there appears to be some marked deviation from the Goldman et al (*ibid*) work. This appears partly as a consequence of more up-to-date literature emerging but additionally organisations operate in a very different competitive environment to that in 1995 when the work was published. This study aims to update and enhance that seminal work, furthering the theoretical base.

The objectives of the research are therefore to define the facets of agility, codify these into a conceptual model which was tested (and the model updated accordingly) facilitating use as a basis for a longitudinal study. Data was analysed to establish systematic contrasts between service industries, public sector bodies and charities using multivariate statistics (ANOVA). This theme is developed further in the next section as I highlight the research methods used within the study.

Research Method for Developing a Measurement Tool

According to Punch (2005) quantitative research is where data are considered in the form of numbers. Balnaves and Caputi (2001) suggest quantitative science involves two key assumptions:

1. That the attribute under investigation is quantitative and
2. Devising a means of measuring

One of the considerations of extending this to the social sciences is the often misguided assumption that what is being measured is in fact quantifiable, to the extent that many psychological variables are by their very nature difficult to assign measurement to but this is purely a cautionary note and not a reason to dismiss measurement, according to the authors.

According to Blaxter et al (2006) the essence of survey research is founded upon standardisation which is derived from asking consistent questions with the aim of eliciting consistent responses. Sapsford (1999) agrees standardisation is the principle requirement in surveys and not achieving this undermines the efficacy of the result. This is contingent upon the use of robust sample selection according to Gill and Johnson (1997) which enables results to be generalised with a high confidence level to a wider population, known as population validity. Since the aim of the study is to gather data as part of a longitudinal analysis from a wider sample at a later date, an element of compromise on population validity is accepted since the results here are not used to generalise, but merely used as a springboard for further testing. Sapsford (1999) continues that standardisation is integral to reliability which dictates the consistency of result using the same measurement and this in turn informs validity. Breu et al (2001) uses structured surveys in the analysis of workforce agility, suggesting this approach is useful when there are many independent variables and there is a need to attribute some form of measurement to the importance of these.

Bowling (2002) suggests structured questionnaires are best suited for collection of factual data and highlights possible failings in relation to attitudes, social processes or behaviours. The ability to collect unambiguous data efficiently means a structured questionnaire is suitable for the first part of this study. This was developed and sent electronically to organisations using Snap v10. I distributed the questionnaires with a covering letter providing background on the research including its importance and how the results would be used, placing emphasis on the fact that there are no right or wrong answers and that completion can be anonymous (if required) – see appendix 3. Gill and Johnson (1997) argue response rates tend to be lower for questionnaires which can be completed in participants own time, although there is no agreed minimum acceptable response rate. Whilst highly structured questionnaires lack a qualitative element, this was addressed in the survey design by:

a) Asking participants what agility means to them in their own words
b) A tick box asking for permission to speak to the participant should clarification be needed or to gather qualitative data later in the study

I was concerned that question phraseology was robust and that responses would accurately capture information relevant to the aims and objectives, thus questions were tested on university staff and peers in the design phase and before issue to

pilot organisations. Cartwright (1988) highlights the issue of item non-response and that based upon surveys in the UK, inadequate responses are three times more likely with postal questionnaires than through interview, an issue that can be ameliorated when the researcher is present. One treatment strategy is to exclude the respondent but this reduces the statistical power of the survey so this was addressed by excluding only the relevant response, and using the average across the remaining valid responses, known as list-wise exclusion and is acceptable given the independent nature of the variables. I considered the issue of non-response in relation to questionnaire length with the concern that gathering information on a diverse range of agility facets had the potential to elongate the questionnaire design. Balnaves and Caputi (2001) acknowledge there are no rules over acceptable length but refer to work by Dillman (1978) which suggests response rates fall significantly for surveys containing more than 125 questions or 12 pages which had the potential to restrict response levels in this study given the questionnaire extends to 142 questions.

According to Gill and Jonson (1997) one of the strengths of surveys is population validity and reliability with a corresponding weakness in ecological validity. Ecological validity falters with the use of structured questionnaires, according to the authors, because responses, whilst meeting the parameters of the framework, give participants no opportunity to articulate their own perspective or conceptualisation. Seymour and McCabe (2007) similarly question the ability of questionnaires to capture the complexity of the phenomenon being investigated, particularly where choice of response is limited. Balnaves and Caputi (2001) point to contrast error where respondents show a natural tendency to avoid extreme responses, for example strongly disagree. These biases are controlled in this study by using suitable wording in the introduction of the questionnaire to explain there were no right or wrong answers and the importance of relaying honest views in the feedback.

Whilst I maintain the integrity of the study in delivering a measurement mechanism which facilitates comparison between organisation types, the shift of emphasis to a more ethnographic stance became an emergent theme and this allows me to test perceptions of agility and build a more comprehensive understanding of what being agile means for businesses and the individuals residing within. According to Blaxter et al (2006), quantitative studies meet the demands of identifying relationships between variables, but are correspondingly weak at explaining the reasons, which can be elicited using qualitative techniques. Van Hoek et al (2001) suggest a qualitative dimension at

an early stage in the process is legitimate when the existing knowledge base is limited and confining the study to the survey can lead to underlying assumptions and challenges being overlooked. In the case of this study, this issue is mitigated through the use of qualitative analysis later in the study, an area I explain in the next section.

Developing a Deeper Understanding of Agility

Bowling (2002) suggests that with a pre coded response choice, some respondents may be forced to choose an answer that does not fully represent their views, and further suggests that there is a potential for social desirability bias with the respondent wanting to present a positive image. Seymour and McCabe (2007) refer to the difficulty of using fixed choice questionnaires, calling into question the efficacy of capturing the 'big picture' to the extent that the complexity of the phenomenon and the causal relationships are subverted. Rooke et al (2009) agree but suggest the widespread use of 'tick-box' surveys merely serves to mirror endemic bureaucracy within firms, and suggest more importance should be attached to how the outputs are viewed. This was particularly relevant to the agility study since the concept is founded upon a complex web of components and any interaction within these could only truly be explored and understood through ethnographic means.

The questionnaire contained a section asking for permission to contact the individual to take part in an interview later in the study. Blaxter et al (2006) advocate following up questionnaires with interviews in this way which allows the researcher to gain a more detailed perspective on key issues and is a legitimate contingency should the response or completion rate be disappointing. In order to encourage participation, organisations were offered the incentive of a copy of the completed agility diagnostic for their own organisation and individual participants were also offered a copy of the final research in return for involvement. Additionally, time was given pre and post interview for the interviewee to ask any question related to the study, consistent with the views of Fetterman (2010) on reciprocity.

Bowling (2002) believes qualitative techniques are necessary for exploration of new issues or building a rich picture on complex problems with quantitative being more useful for building upon an existing body of knowledge or less complex issues, which are open to valid and reliable measurement. Given these differences, Bowling (*ibid*) advocates use of multiple methods, or triangulation, in order to check validity and provide linkage of meaning to quantified data. For the purposes of the research into

organisational agility, the quantitative data was triangulated later in the study using qualitative techniques and this enabled me to initially focus on using a measurement tool to make comparisons between industries but additionally attempt to build an understanding of just what agility means for practitioners. Moreover, given the lack of consensus within the literature around what constitutes an agile organisation, qualitative analysis allows a clearer picture to emerge of some of the perceived drivers behind an agile organisation, thus overcoming one of the issues identified by Bowling (*ibid*). It is also evident that using an established model (Goldman et al 1995) whilst useful in providing a baseline, advances concepts that are obsolete or misguided and therefore lack relevance to the modern organisation. Triangulation in this study however often fails to substantiate key elements and merely serves to heighten inconsistency, for example the strong sense that innovation has an influential role in bringing about agile outcomes, simply is not supported by the results of the survey.

The qualitative element is achieved through the use of interviews using semi-structured questionnaires. Given the paucity of a consensus around the composition of agility, this study assumes an exploratory persuasion and this means fully-structured interviews would have been inappropriate. Similarly unstructured interviews do not provide the degree of focus required in building an understanding of how the perception of agility compares to the body of literature. Gill and Johnson (1997) refer to indexicality being the way in which people modify or vary behaviour according to the social setting they find themselves in and question whether outputs are manifestation of research procedures used to collect data rather than the reality of a subject's natural surroundings. Sapsford (1999) highlights other restrictions of interviews such as the interviewee picking up on accidental or unintentional cues from the researcher or a social desirability bias. He continues that it is incumbent on the researcher to overcome these issues by an awareness of their own possible influence on the situation. Whilst most of the interviews were face to face, geographical issues meant several were conducted via telephone. The remoteness of telephone interviewing removes the ability to gauge response and read body-language but I tried to alleviate this by spending time before each interview positioning and trying to put the participant at ease. Moreover it was explained that there were no right or wrong answers, that notes would be made during the interview but not to attach any significance to this.

Participants can also be given prior details of the interview content (Blaxter et al 2006), this being relevant where they may be expected to collect detailed information to facilitate the interview. Since interviewees were expected to share insights into

agility and given the esoteric nature of this, prior sight of the questions seemed more equitable. This represented a change from the first interview, when the participant did not have advanced sight of the questionnaire but where the feedback was that he found the subject matter quite specialist and this was evident from the stilted response patterns. For consistency, interviews were recorded and transcribed and this allowed me to capture large amounts of information but additionally identify common themes.

Gaining access to organisations was not without its challenges and as I explain in the next section, an element of compromise was necessary to arrive at a suitable sample.

Securing Participation from Organisations

A gap exists in the literature such that organisational agility has been considered extensively in manufacturing (Goldman et al 1995) but the relevance to service sectors has not been tested to any great extent. Damanpour (1996) suggests there are fundamental differences between manufacturing and service based firms with the latter more varied and more likely to experience simultaneous production and consumption of outputs. This contrasts with manufacturing where there is often a lag between production and consumption. McGrath (2013) suggests agility may even be *more* relevant to service industries due to the prevalence of imitation which fuels the need for constant change. This suggests agility is arguably more relevant to services than manufacturers. Emphasis on service organisations is also highly relevant since according to PWC (2009) the sector accounts for significantly more in terms of GDP within the UK, meaning agility within manufacturing which accounts for only 14% of GDP, carries less significance in the UK.

Sapsford (1999) illustrates the importance of sampling in relation to aligning the sample for investigation as closely as possible to the wider population so generalisations can be made. Blaxter et al (2006) identify two dimensions of sampling – probability and non-probability. Probability sampling provides the opportunity for each member of a population to have an equal chance of inclusion. Non probability sampling is more relevant where the researcher lacks a sampling frame or where a probabilistic approach is not necessary. Sampling for the purposes of this research was originally drawn from organisations included in an International Open Ended Investment Company (OEIC). An OEIC is an investment company

which collects money from investors, which is pooled and used to invest in a range of 'listed' companies. Emails were sent to the head office of 100 organisations where the OEIC held a stake, asking them to participate in the research along with a copy of the questionnaire but this failed to elicit anything but a handful of responses, so few that comparisons would be impossible. This is unsurprising, since Satirenjit and Renganathan (2010) suggest access for research purposes is more serendipitous than skilful and Gill and Johnson (1997) experienced a refusal rate as high as 85%. The eventual sampling technique is non-probability and whilst convenience sampling is also used, this is augmented by purposive to provide a balance of participating organisational background.

Dyer and Shafer (1998) suggest that given the limited understanding around organisational agility, purposive rather than random or convenience sampling should be deployed and this combined with in-depth case analysis would help to build and understanding of the phenomena, a view consistent with Rohrbeck (2010). The views of Dyer and Shafer (1998) were perfectly relevant in 1998 when the concept of organisational agility was in its infancy but understanding of the phenomena has evolved and this legitimises the use of a convenience sample. Moreover the dearth of responses from the mailing to 100 organisations within the OEIC necessitated a convenience sample. Fetterman (2010: 35) agrees with this approach and suggests a starting point 'wherever [the ethnographer] can slip a foot in the door' and it is common practice within ethnography to use judgment to select appropriate participants. With this in mind, contact was made with 20 UK service based organisations, where I had a known point of contact, drawn from a range of industrial sectors including the public sector.

Of the twenty approaches made, six agreed to take part. I had considered the issue of further poor response, and if this had been the case, my intention was to extend the sampling frame until I had reached what I felt was a robust sample or I had considered adapting the study to financial services companies where, through my banking career, I have an extensive network of connections. The eventual sample size is not however inconsistent with other studies and the organisations taking part are of mixed background (financial services execution only, financial services advisory, telecoms, healthcare, public services, charity). As the study is predicated on self-assessment, the views of McCann et al (2009) are highly relevant on the basis that self-reporting allows comparisons between organisations of varying backgrounds and size. Zhang and Sharifi (2000) use a sample of 6 UK organisations, drawn from manufacturing although

an assessment is been made around the existence of environmental turbulence in each case. I decided against this as I did not wish to necessarily eliminate organisations which had stable operating environments since a key element to understanding agility would be to make comparisons between firms operating in turbulent and stable backgrounds. Appendix 1 provides an overview of the participating organisations.

Questionnaires were sent to the CEO or designated Board member with a covering note asking for distribution to twenty staff within the organisation across four managerial levels – board level, senior managers, middle managers and non-managerial. In instances where the organisation had a headcount of less than twenty, as in the case of CDC, the firm was asked to distribute the questionnaire to all staff. For those organisations where headcount exceeds twenty, the firm was asked to apportion questionnaires along the following splits - board level 10%, senior managers 20%, middle managers 30% and non-managerial 40%. These splits were chosen to be representative of a 'typical' hierarchical structure. Engaging with only senior management, whose purview is strategic, creates a risk of bias since they typically possess a different perspective to those further down the hierarchy, and this is very evident within the study. According to Jackson (1997) there is a tendency for senior management to have a tainted view of the organisation since they are often presented with incomplete or worse still, manipulated information because middle managers often do not wish to pass on 'bad news'. This potential bias was foremost in my mind and mitigated by asking participating organisations to distribute questionnaires to all levels, enabling the capture of views from across the hierarchy, this being consistent with the approach used by Aaker and Mascarenhas (1984) around flexibility. Sapsford (1999) identifies a potential failing with questionnaires distributed in this way is the lack of control around completion to the extent that the survey could be filled in by individuals not actively targeted or by committee. This is alleviated to some extent by the request to take part in follow-on interviews since a strong bias to one management population would become evident when I began interviewing but his concern proved unfounded. Completion rates for each respective managerial layer are as follows:

Board level 5 (12%)
Senior Manager level 10 (25%)
Middle Manager level 11 (28%)
Non-Managerial 14 (35%)

In percentage terms these are all within 5% of the required distribution for each management group. Having established that the sample was in line with requirements, I now describe the development stages in the research, starting with survey design.

Survey Design

Survey design is predicated on two parts. The first aims to address the various characteristics of the agile organisation and the relative importance of these. The second measures the performance of participating organisations in relation to each characteristic in part one. The framework for the *design* was inspired by a competitive strength analysis in Thompson et al (1978) where comparisons can be made with competitors by allocating an importance score to the key success factors for the industry and applying an achievement score for each organisation being analysed. I feel this format is perfectly transposable to a means for measuring agility since it captures the essential components (characterisitcs) which are needed to effect agile behaviour, attaches an importance level and additionally makes an assessment an organisation's capability against each dimension.

For part one, the industry audit developed by Goldman et al (1995) is used to provide a basic structure for the suvey, reflecting the four pillars of customer, structure, cooperation and people. In addition to providing a taxonomy for agility, the Goldman research also provides many of the agility characteristics needed to effect agile outcomes. However my review of the wider academic base revealed agile characteristics not considered in the original research. Where this was an isolated issue, I did not alter the structure of part one, but where a particular facet was identified more widely amongst the more recent literature, I used this to augment the Goldman framework. The actual framing of the question is either replicated from the Goldman audit where relevant, the original question adapted to make it more relevant to service organisations (see 'development of research') or I devised a suitably worded question based upon the literature. In relation to part one, the construction of the question around each facet is about its importance for an organisation to be *regarded* as agile, for example 'Q2 An agile organisation places an emphasis on innovation and design'. A summary of the agile traits identified in part one and their origin is included below:

Key Agility Factors - Literature Source		
Key Agility Factors (KAF)	**Goldman et al (Y/N)**	**Other Sources**
Customer		
Solutions not products	Yes	
Innovation and design	Yes	
Assimilating information	Yes	
Mass customisation	Yes	
Structure		
Configuration	No	Kidd (1994), Miller (1986, 1987, 1996), Bennis and O'Toole (1993)
Control and hierarchy	Yes	
Speed of response	Yes	
First mover	No	Hamel and Prahalad (1994), Zhang and Sharifi (2001)
Supply chain	No	Backhouse and Burns (1999), Christopher and Towill (2000), Christopher (2002), Christopher et al (2004)
Change management	No	Dunphy and Stance (1998), Branson (2008), McCann et al (2009), Shalit and Yaniv (2011)
Adaptive strategies	No	Romanelli and Tushman (1994), Brown and Eisenhardt (1997), McCann et al (2009), Rohrbeck (2010)
Co-operation		
Alliances and partnerships	Yes	
Distinctive capability	No	Drucker (1980), Kay (1993)
External environment	Yes	
Supply and demand drivers	No	Lampel and Mintzberg (1996), Fliedner and Vokurka (1997)
Dealing with unpredictability	Yes	
Appropriating benefits	No	Kay (1993)
People		
Enabling employees	Yes	
Motivating people	Yes	
Nurturing competencies	Yes	
Exploiting information	Yes	
Culture	No	Handy (1976), Dove (2001), Branson (2008), Trompenaars and Hampden-Turner (1997), Davis et al (2010)

Table 4 The information sources for survey questions in part one (agility charateristics)

In relation to part two I followed the same process of extracting questions I felt were relevant directly from the Goldman Audit. An example of this is the first question in part two around the importance placed upon customer satisfaction. It should be remembered that the Goldman study is focused on manufacturers so in many cases I had to adapt the question to make it more relevant to service organisations. An example of this is the Goldman (*ibid*:359) question 'are you optimizing for mass customisation or mass production' which was changed to 'our organisation can customise its products or services to individual customer needs'. The most significant issue however is the wealth of research produced since Goldman. This means configuration for example, which did not even feature in 1995, had to be tested for its significance to the modern organisation. Moreover, even within some of the characteristics identified by the original authors, the body of literature had either advanced or had taken on additional nuances which had to be tested within the survey for relevance. This is the primary reason for the length of the questionnaire. I approached this by working through the draft of the literature review and identifying the key nuances for each agility characteristic from all the contributing authors, framing questions around each that I felt were relevant. As a consequence of this, the efficacy of each organisation against each characteristic is

tested by a number of questions (for example, 7 questions are included around evaluating the environment), rather than one as is the case with the Goldman audit. This creates a more fulsome view of each facet of agility since it allows me to elicit feedback from practitioners in relation to the contribution from a number of authors and allows me to include more contemporary views on each. Approaching parts one and two of the survey in this way is fully supportive in developing the Thompson et al (1978) for use as a measurement for agility, which would not have been possible by simply adapting the existing Goldman model.

Having explained the sources of the items included in the survey, I now describe the scaling of the survey. Kidder and Judd (1986) refer to ordinal scales containing two or more categories which allow differentiation and an element of ordering but with no significance attached to the distance between each point. The scale measures the extent to which the respondent agrees with each statement where convention is to allocate high scores to favourable response. For the purposes of the first section of this study, a ten point visual analogue scale (Bowling 2002: 290) is used to calculate the importance weighting for each agility trait which allows measurement to be assigned and helps to overcome an issue identified by Bowling around attaching equal measurement between points on a conventional Likert scale. Whilst even a VAS can make no assumption about respondents assigning scores objectively or consistently, I feel a 10 point scale reduces the likelihood of paticipants feeling 'forced' into selecting a response which is not an exact reflection of their opinion. Zhang and Sharifi (2001) use a ten point VAS in their attempt to measure agility but Bowling (2002) does caution a VAS is merely an extension of a Likert scale and thus has the same fallibilities, in this case the scale being open to interpretation.

For the second section of the questionnaire, respondents are asked to evaluate their own organisation's achievement in relation to each identified Key Agility Factors (KAFs) by answering a series of 'behavioural' statements. Here a 6 point Likert scale is used with a provision for 'don't know' and 'neither agree nor disagree' response. The issue of whether to use a 5, 6 or 7 point Likert scale was considered in relation to this study but Bowling (*ibid*) points to a dearth of evidence supporting one scaling method delivering superior results. Whereas the 10 point VAS is used in section one of the survey, this is appropriate since it contains only 19 questions, which are generic in nature i.e. what makes a firm agile ? Section two is more complex as it asks respondents to make an assessment of their own organisation's capabilities and is longer, so a more simplistic scale feels intuitive as it facilitates completion.

Given the desire to capture significant amounts of information from the survey I faced the dichotomy of a making it a one or two stage process. In view of the risk of attrition between stages I decided to condense data collection onto one questionnaire but this further creates tension between the attraction of gathering copious data in one 'transaction' and the risk of a complex and lengthy questionnaire impacting upon response rates. This is partly resolved by the use of verbal protocol analysis (VPA) (see pilot study) but in addition Bowling (2002) regards lengthy questionnaires as perfectly legitimate when steps are taken to remove complexity and make questions relatively quick to answer. Further, the risk of non-participation was mitigated by offering compliant organisations the inducement of a diagnostic evaluation of their own organisation's performance based upon the feedback received.

Having described the issues relating to survey design, this was tested through a pilot study and this is explained in the next section.

Pilot Study

A pilot was used to test the model and allow me to make an assessment of whether this was scalable. Blaxter et al (2006) advocate the use of a pilot in survey type situations to allow modification of questions in the light of feedback received. The selection criteria for participants in the pilot study was a small convenience sample (two organisations), drawn from the six organisations agreeing to take part. The constituents for the pilot were restricted to the smaller companies sector where I had established points of contact, but in addition smaller companies tend to show hallmarks of rapid change in response to the turbulence often associated with being reliant on one or a small number of markets. Moreover, testing the model on a small scale mitigates the risk of a large number of 'wasted' responses as a consequence of any failings in the questionnaire design. Gill and Johnson (1997) acknowledge that access to senior management can be a serious impediment to progress as this is not given lightly. By focussing the pilot on organisations where access was readily granted, this enabled me to maintain an open dialogue with participants to test the questionnaire, elicit feedback and refine accordingly.

Sapsford (1999) highlights the basic premise of the pilot being used to provide assurance that the measures produce consistent results. Given the requirement for the survey to elicit a large volume of information, the first stage in the pilot was to test the

questionnaire using VPA. According to Robie et al (2007) VPA is used to collect data on the process of decision making by asking participants to verbalise their thought process whilst performing a task(s) - in this instance, filling in the questionnaire, a concept advocated by Schweiger (1983) as 'thinking aloud'. Robie et al (*ibid*) suggest VPA is useful since the process is recorded and allows the researcher to collect unambiguous feedback, without the potential distortion of having to recollect the experience some time after the event. The authors identify a potential bias with the use of VPA being the influence of the researcher cueing the participant for certain information. This was managed by providing clear guidance at the beginning of the process but with no further prompts or cues during the process and Iused this to test the following, consistent with the views of Bowling (2002 : 276):

- That each question is measuring what is intended
- To check the understanding of respondents in the use of the questionnaire
- That respondents understand the instructions around completion
- If any questions are systematically not completed or elicit neutral response
- Whether there remain areas which are untested and should be incorporated
- The level of motivation to complete the survey
- How respondents 'feel' towards completion

The participant was selected from one of the private sector firms from a senior management position so as to mitigate views which might be tainted by board level seniority, but with sufficient commercial breadth and management acumen to provide a holistic view. It was also felt a senior manager would equally benefit from operating at a level in the hierarchy more 'connected' to and sharing empathy with non-managers. VPA involved recording and transcribing completion of the survey with the respondent providing feedback along with any spontaneous thoughts whilst working through the questionnaire.

One of my primary concerns was the length of the questionnaire and the tension between the risk of low response rates whilst attempting to capture sufficient information about agile traits and behaviours. This proved not be an issue from the VPA, with the length and depth of the questionnaire deemed 'about right' added to which it was felt the time guide for completion on the front of the survey was of use. No issues were identified with part 1 of the survey which asks participants to provide an 'importance score' for nineteen identified agility traits. The VPA process did

identify one important issue which was the use of esoteric terms which it was felt might not be easily understood by some participants, particularly non-managers. Given that agility is strategic in nature (Hormozi 2001), this was acknowledged as a potential issue but it was decided not to over-simplify the questionnaire, the reasons for this are:

- There may be an important differential to be made between the perception of agile characteristics between managers and non-managers and this is part of the analysis
- A substantial 'don't know' or neutral response from non-manager populations could help to ratify agility being a more strategic phenomenon which is largely confined to senior levels of the organisation. Herein lies something of a paradox since agility is often associated with strategy and thus upper levels of the hierarchy yet the hallmarks of agility (sensing, customer interface) are influenced by those lower in the hierarchy.
- There is a risk that the esoteric nature of the questionnaire, coupled with its length might lead to a low response rate from the non-manager population within each organisation. This risk I viewed as subordinate to missing an opportunity to gather large amounts of data
- Given that agility represents a collection of traits, which vary from organisation to organisation, data collection is felt to be a more worthwhile pursuit than equitable completion rates for each management strata

Whilst the VPA process identified no questions as unsuitable, the issue of esoteric knowledge required to complete the survey was strongly delivered. This lead me to modestly adapt certain questions to facilitate easier response from non-managerial participants, for example in part 2, section B the question around working with suppliers was given some context to explain what constituted a supplier. The pilot did start to provide some clarity around which factors industry regards as prerequisites to be considered 'agile' and the relative importance of these but it was necessary to develop the research further and this is considered in the next section.

Development of Research

According to Gill and Johnson (1997) becoming entrenched in reviewing existing literature is not uncommon but becomes an inhibitor to original thought as

researchers become unduly focussed on the work of others. According to Randolph (2009) an effective way of searching literature is by accessing electronic databases and scanning the reference lists of resultant articles which are felt to carry the most relevance to the subject matter. I used this as an iterative process which uncovered additional journal articles, theses and conference papers which themselves created additional areas for investigation. This was repeated until a point of 'saturation' was reached and no new relevant articles emerged but it is only by fully understanding the literature that gaps in the knowledge base can be identified and exploited.

Easterby-Smith et al (1991: 9) suggest one way of establishing theoretical outcomes is to use previous studies as a platform but to manipulate a number of variables. The original starting point for the research was a framework developed by Goldman et al (1995) with the starting hypothesis being 'agility facets are not homogenous across industries but demonstrate significant variance'. This approach has the advantage of utilising a previously tested model, albeit in manufacturing, developed by seminal researchers in the field ensuring linkage to a recognised framework. However a number of issues were identified in relation to the Goldman model:

1. It was clearly designed as a means to audit manufacturing companies around their agile capability but a key dimension to this study was extension of agility into service based organisations, public sector bodies and charities which made elements of the model unsuitable since it was product oriented (An example being 'Is the organisation focused on customer satisfaction or product shipment' ?)
2. The model was designed as an audit and thus was structured around closed questioning (e.g. 'can your customers just deploy what you sell them and benefit' ?) yet the aim of this study was to devise a model for quantifying agility
3. It was designed in 1995 meaning the body of literature on agility had moved on considerably (e.g. the concept of leagile came to prominence in Christopher and Towill (2000) and Mason-Jones et al (2000) and these more recent concepts needed to be tested), making the aim of my study more contemporaneous.
4. Many of the questions were esoteric in nature which would be suitable if the survey was to be completed only by senior managers. However with the desire to engage with those further down the hierarchy, questions such as 'does your organisational structure facilitate concurrency throughout the enterprise' were felt to be too complex

5. Several questions were positioned to elicit one of two separate responses (e.g. ‘are you focusing management attention on core competencies or on factory efficiency’ ?)

The above issues were overcome in the following ways:

1. Any questions explicitly related to manufacturing were either adapted to suit service industries or where this was not possible, the original question was discarded
2. Any questions retained were adapted to self-assessment style statements about the participant’s organisation. This removed the question from a closed style to one which could be quantified using a Likert scale (e.g. ‘are you selling skills knowledge and information in a relationship over time or just products in sales transactions’ becomes ‘our organisation sells skills, knowledge and information rather than simply a product or service’)
3. The question bank for the survey used the original Goldman audit as a framework but was augmented by questions drawn from more recent literature (e.g. ‘we acquire knowledge from a variety of sources and channels’ is drawn from research by Sambamurthy et al (2003)
4. The more esoteric or technical questions we deconstructed into more simple concepts to reduce the number of neutral or ‘don’t know’ responses. Thus the question around concurrency for example, was reframed into ‘when designing new products or services within our organisation, we are able to complete various stages of the process at the same time’
5. Any dichotomous questions were removed and replaced by two separate behavioural statements

Having refined the survey and tested it through VPA and a pilot, the next stage was to extend this to other participating organisations and this is considered next.

Scaling up the survey

The questionnaire consists of two primary sections. Within the first, participants were asked to allocate a score to signify the importance of each of the KAFs identified from the literature. The scores are used to calculate relative weights for each KAF by totalling all the scores and expressing the individual KAF score as a percentage, an approach Yauch (2011) uses in the design of an agility measure. This provides a useful indicator

in furthering objectives 1 and 2 by providing some clarity around the existence of agility traits and the relative importance of these across industries.

Bowling (2002) refers to a numeric scale, which is a variation on a 'visual analogue scale' (VAS) whereby respondents are asked to mark their agreement on a numerical scale to a statement(s) containing two anchor points representing extremity of views. This was selected as the method for assigning weights to KAFs since it has the advantages of allocating a 'score' to each KAF but in addition, the format is conducive to helping respondents understand what is required of them and is consistent with the measurement of agility factors used by Zhang and Sharifi (2001).

The second section is also quantitative with organisations asked to make an assessment of their organisation's capability in scanning and responding along the weighted dimensions in section one to arrive at an overall agility score. According to McCann et al (2009) self-reporting facilitates superior comparability between respondents from different industrial backgrounds and organisational size. The second section uses a 6 point Likert Scale to gauge the extent to which participants agree with their own firm's performance against key statements framed around KAFs. Hallgren and Olhager (2008) use a 7 point Likert scale to gauge how workers rate their own organisation in relation to competitors but this presupposes some esoteric knowledge of competitors and an ability to quantify this. For this reason I made the decision to measure agility in absolute terms as opposed to some relative measure.

Given the significant variation within the literature around how agility is composed, I felt a greater understanding of the phenomenon could be established by asking workers in organisations to articulate what they feel being an agile organisation involves, and what behaviours or traits would be most influential to affect agile outcomes. This is described in the following paragraphs.

Capturing the Views of Practitioners

Whilst the survey enabled me to capture numerical data, of increased importance to me as the study evolved was what agility meant to those working in organisations, and how their view might differ from the literature. The survey invites participants to take part in the second phase of the research which is follow-up semi structured interviews where perceptions and any inconsistencies with the body of literature can be explored in more detail. Blaxter et al (2006: 84) suggests the use of follow-up

interviews allow researchers to gain a more granular insight into some of the key issues raised from a survey. Fetterman (2010) regards formally structured or semi-structured interviews as a manifestation of a questionnaire and can lead to response patterns conforming to the interviewer's perception of reality but in this study I was very keen to calibrate questions which were more likely to elicit responses conforming to the participant's view of agility and it was felt semi-structured would better facilitate this.

The primary aim is to test common perception against the literature and the outputs from the quantitative phase of the study, fully recognising that some aspects of agility can be substantiated but just as importantly to evaluate contested themes. A qualitative approach was adopted, involving 10 semi-structured interviews, each lasting around 45 minutes with the strategy being to ask participants to state in their own words what characteristics an organisation needs to master to be regarded as agile. The importance of this process is that it allows the concept of agility, which is widely contested, to be examined to establish a 'true meaning' and how this might differ from academic viewpoints. All interviews were conducted at the respondent's place of work, a venue of their choosing or via telephone where geography was inhibitive. Recording and transcribing the interviews allowed me to compare word patterns against the literature to test for inconsistencies.

In order to extract maximum value from the interview process, it was necessary to create an environment of openness. Before commencement all interviewees were provided with a background to the study and with assurance that all views expressed were confidential, that no quotations would be identifiable to the respective individual and that no content from the transcripts would be made available to any of the participating organisations. The interviews generated copious qualitative data which was used to distil into common themes in relation to agility with verbatim comment from the interviews to reinforce key messages. I attempted to guard against taking a participant view fixed to a unique moment in time, the aim was to trace 'a curve of social discourse, fixing it into a respectable form' (Geertz 1973, p19). Fetterman (2010) regards verbatim quotes as useful for capturing peoples' thoughts and emotions and whilst the author acknowledges lengthy quotations can appear unwieldy, careful selection can help paint a rich picture, presenting a myriad of ideas to the reader. Whilst using quantitative techniques is both legitimate and developmental, I became more questioning with respect to the efficacy of quantitative analysis in isolation, particularly given the paucity of understanding around agility.

Analysis of the qualitative data however proved an epiphany as fulsome passages of text, drawn from the recordings, allowed the emergence of common themes and provides a rich context around what agility really means for business. Geertz (1973) likens this to the difference between capturing what is in a participant's head to looking over their shoulder at what they are actually doing.

I started the process of interviewing whilst still awaiting some survey responses, thus running the quantitative and qualitative phases of the study concurrently. Part of the rationale for doing this was to not protract the data gathering indefinitely but additionally, conducting interviews concurrently with quantitative data analysis prevents bias in the interviews flowing from the quantitative element of the study. Given the imprecise nature of agility, there are inevitable limitations associated with the design and these are considered more fully in the following section.

Limitations of Design

When considering the concept of organisational agility, this can be regarded as a process which starts with evaluating the external environment then moves through a firm's agility need level, before assigning measurement and ultimately solutions and outcomes. To evaluate all aspects of this process within one study would lead to each element being considered only superficially so the study focusses on just three aspects of the process – agility traits, attaching measurement and considering potential solutions. Graphically this can be summarised as follows:

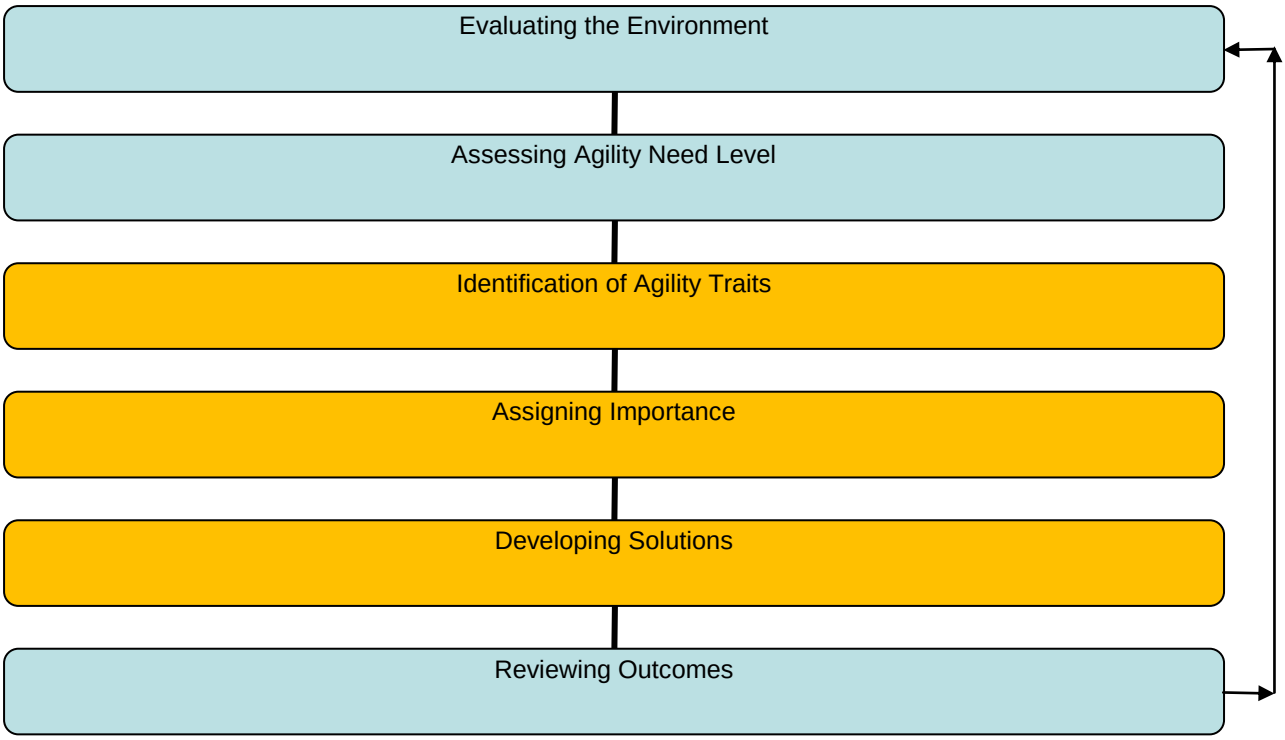


Illustration 8 The Agility Process – areas highlighted amber are in scope within this study, blue are out of scope and are areas for further study

It is recognised that whilst the areas shaded amber represent the main area of analysis for the survey, it is fully accepted that trying to build an understanding of the phenomenon through inductive methods, will inevitably lead to a degree of 'bleed' into some of the elements highlighted blue, however I have tried to control this to maintain focus. Whilst Zhang and Sharifi (2001) consider the agility need level as a manifestation of the perceived level of turbulence within an industry, this is not considered directly as part of this study. It is acknowledged that organisations registering a low overall score on the CAM could simply be as a consequence of a reduced agility need level, but this study makes the assumption all six participating entities have at least some need for agile behaviour.

The original aspiration for the research was to include a cross section of organisations to include private and public sectors. Whilst there is recognition that private entities are duty-bound by their governance responsibilities to deliver value for shareholders, there is anecdotal evidence of the public sector having to act more commercially and this makes it a worthy component for the study. As a consequence of the significant deterioration in UK public finances (Elliott (2011) between 2008 and 2011, many public bodies are experiencing significant shrinkage and cost cutting. Under these conditions I felt an analysis of the public sector in relation to agility might be skewed but despite the

challenging environment for the sector I decided this would form part whilst recognising this could have an impact on outcomes, particularly from the interviews.

Whilst previous studies in relation to agility are confined to specific geographical regions (Van Oosterhout, Netherlands 2006, Vazquez-Bustelo, Spain 2007), no evidence has been found of a comparative study across geographical boundaries. Whilst there is undoubted commercial viability in completing a broad international study, I felt not only was this ambitious, but access to information proved to be problematical. The research therefore focuses on UK based service organisations drawn from a cross section of industries and organisation size on the grounds of a) relative ease of access to information and b) known for greater willingness to participate in studies of this nature. I also considered that confining the study to the UK to test the model would help to control for the effects associated with national culture differences, an issue identified by Cepeda-Carrion et al (2012) but by drawing on a list of firms operating across a range of sectors, it is likely the results can be generalised to some extent to countries with common cultural characteristics. A suggestion for future research is to test the measurement tool across a broad range of geographical locations and it is anticipated this will form the next stage of the longitudinal study.

The intention of this study has always been to be part of a longitudinal research programme so the development of the CAM seeks to lay a foundation for this. Whilst the initial aim of this part of the study was to devise a measurement tool, it is evident there is a paucity of knowledge around agility in relation to sectors other than manufacturing. To bridge this gap, the study evolved, setting out as purely quantitative, to part qualitative, attempting to test the perception of agility within industry against the body of literature and identify differences. This more in depth picture of the perception or importance of agility would have been more problematical juxtaposed to a large-scale quantitative programme.

Having considered the obvious limitations within the design, I now describe issues such as my own influence on the enquiry along with any bias which might impact on the analysis and this is considered in the reflective section which follows.

Being Critically Reflective

According to Reynolds (2011), reflection is concerned with thinking about events, situations or actions, drawing on our own or others' ideas in order to try and make sense of them and informing future decisions or choices. Cunliffe (2002) suggests reflection is less problematic when there is an existing model researchers can think about and explain. This contrasts with reflexivity which is brought about by more complex or vague issues where the researcher will be concerned with contradiction, ambiguity or dilemmas. My background being from a large corporation which was prescriptive in nature, I found the transition to researcher and particularly the philosophical stance I was expected to bring to the study, difficult to overcome. Part of this was understanding my own role within the research which was initially from an angle of 'seeking answers', which Goodman (1978) refers to as 'truth'; I had a very clear vision of the direction I wanted to take the study which was to formulate a means of measurement, but as I began to assimilate data and conduct interviews it became apparent that whilst I would partly fulfil my objective of seeking answers, equally relevant was an acknowledgement that I would have to live with considerable ambiguity, which in some way is synonymous with the difference between the natural and social sciences. Denzin and Lincoln (1998) identify with this issue due to the difficulty of reconciling objectivity with the subjective nature of human experiences and suggest one way of overcoming this is to ignore this conflict by accepting the hermeneutical nature of existence on the basis interpretation is not simply a methodological paradigm, but the essence of human experiences. Thus I came to see the interviews as a means of constructing 'themes', detached from the actual event of 'doing' at a particular time or place into an interpretation of the meaning. The authors additionally suggest humans act rather than respond and therefore truth is established as a consequence of purposeful action, but agility appears not to be driven exclusively by human interaction but a wider context such as structure.

Cunliffe (2002) aligns this learning experience with continual rejuvenation of our way of being, brought about by 'relational moments' (p38). Rooke et al (2009) suggest as a starting point, the phenomenon must be accessible to the researcher to be observed, and specifically relating to quantitative, it must be countable. In this respect, using mixed methods to collect data did reinforce some themes such as speed of response being critical to agility, but equally it heightened the sense of ambiguity such as the role innovation plays in agile firms which emerged strongly from the interviews but was not regarded as important within the survey. In light of

this, my own role was ‘enlarged’ from simply ‘seeking answers’ to ‘furthering understanding through distillation of uncontested themes and articulating and making sense of ambiguities’. This has changed my thinking both in my academic and professional life and echoes with Cunliffe (2002) to the extent that learning is derived through reflection which is as a consequence of internal and external dialogue to make sense of experiences.

This appears to be consistent with the three models of critical reflection posited by Reynolds (2011) – technical, aligned and critical. Technical assumes a focus on means since ends can be assumed as satisfactory. This resonates with this study since agility is an accepted response to the issue of change in the external environment. Practitioners were universally in agreement there is a need for agility, but the means for achieving this are contested. Aligned reflection takes a stance that there is an element of consistency across the beliefs that underlie solutions but this was not evident in the case of organisational agility. This is to be expected where the need for agility differs and the means of achieving it is idiosyncratic. There were however themes where there was alignment of importance. From the survey these were reading the external environment, utilising information and speed of response, but these featured less in the qualitative part of the study where customer outcomes were cited as more important. In fact only one characteristic featured consistently important across both phases of the study – speed of response, which reifies agility having connotations of nimbleness. This appears to support Reynold’s view around critical reflection where contradictory interests are at stake and this was evident across and within organisations.

Cunliffe (2002) highlights the systemic bias for applying theory to situations which often overlooks the reality that practitioners have to grapple with complex, isiosyncratic and poorly defined issues, and this seems a reasonable metaphor for agility where the question is whose interpretation I was referring to. My own experience was rooted in reviewing literature and subsequently from interviewing practitioners, but the issue with participants was that whilst they tended to agree on the need for firms to demonstrate agility, experience was limited and even when able to cite examples of agile firms, they struggled to articulate what precisely the defining characteristics were. Furthermore it was felt firms that are agile (e.g. Apple) are not self-professed to be so, they simply are as a consequence of how they behave. One issue here is that ideas and views can be formed over a period of time but this study was predicated on a ‘snap-shot’ survey and follow-on interviews meaning participants

after a period of reflection could elucidate differing views. Observation relates exclusively to the circumstances prevailing at the time and therefore may not serve as reliable knowledge. This dilemma would be mitigated by a longitudinal programme of which this study is the first part.

I have tried to examine the experience as opposed to simply living it and this has enhanced my learning since this study I have been able to 'step-back' and be objective rather than simply relying on the views expressed in the literature. Geertz (1973) argues views expressed can themselves be derived from a chain of interpretations. Despite the use of mixed research methods where my own naive expectation initially was that triangulation would lead to a natural and undisputed conclusion, many characteristics around agility were contested. The basis for reflection needs to be qualified in that this study aims to build an understanding around what makes an organisation agile, or put another way, content. This appears one-dimensional as it says little (other than through the Midland Heart example) about the *process* and for this reason a suggested area for further study is a case study examining a 'journey' towards becoming agile, including some of the change agents and how these were identified.

Using the philosophical interpretation of 'if and only if', a subject can only believe a concept to be true if it is true, he believes it and he is justified. Relating this to agility potentially creates a conflict as the subjects cannot, and do not claim to know the phenomena, but may believe in it and their beliefs may well be justified. My views are justified and they are supported by evidence but I do need to question the knowledge base from which such evidence has been elicited, and whether this can be truly rational. I have reflected that scepticism is a question of degree which opens an ontological debate about agility to the extent that characteristics which make up agility exist, but epistemologically, the outcome from the collective parts lacks clarity and thus cannot be truly known, understood or defined. Seymour and McCabe (2007) acknowledge the nebulous nature of terminology since whilst agility can be (and was) freely interpreted in a variety of ways by interviewees, the component elements, particularly innovation which featured prominently, could be similarly hard to define. This caused me to question the basis upon which knowledge or expressed views are founded but this is perhaps not surprising since as a researcher I had to resist the temptation that a ready-made view of agility existed.

Gettier (1963) suggests a piece of knowledge (A) is justified as it is based upon another model (B) which constitutes evidence for A. But this can only be robust if B is legitimate knowledge and justified, the question being how B got to be justified, and whether this could in turn be predicated on another model (C). Geertz (1973) regards reviewing literature itself as a manifestation of a chain of interpretation. If these evidence trails were infinitely long, it would lead us to question whether any beliefs are ultimately justifiable but the foundationalist view overcomes this by refutation that all beliefs need to be based upon others in order to be justified. 'Properly basic' beliefs (DeRose 2005) are formed independently of others, serving as a foundation upon which all justified beliefs rest. Coherentists reject the foundationalist stance and purport that beliefs can only be grounded on linkages to others and it is the coherence of these beliefs which justifies acceptance. In relation to this study, there is no denying that my own beliefs were initially shaped by the views of Goldman et al (1995) since the four pillar model was used as a basis for the quantitative element, fully reflecting the foundationalist view as I had no a priori knowledge of the phenomenon, but this does raise the issue of how the views expressed within the interviews were formed and whether these were founded on any pre-existing mental models and indeed the validity of these. Seymour and McCabe (2007) consider this issue by concluding that validating knowledge can only be within the setting about which a truth-claim is made, and any biases or inconsistencies do not undermine the research as actors merely present facts from the setting in question. Cunliffe (2002) agrees by regarding social reality as created by everday interactions and making sense of what is happening around us occurs as a consequence of dialogical practice. This accords with the views of Denzin and Lincoln (1998) that advancing knowledge can be attributable to untangling seemingly contradictory messages to arrive at a system of interpretation, this being reflective of my shift away from truth-seeking or perceived wisdom to adoption of a new order of agility.

The diversity of literature I covered during the formative part of the research did serve to build my knowledge base particularly relating to agility components with a corresponding downside being most corporate characteristics appeared to carry at least some relevance to the agility agenda but Seymour and McCabe (2007) suggest the role of the researcher should be to elicit how *participants* theorise, contextualise and align values within a given setting and to record this accurately. The authors fully ascribe the notion that researchers will hold opinions but to recognise their impact on the setting. Naturally at this stage in the study my knowledge base differed markedly from survey and interview participants and I wanted to avoid the distortion associated

with reconceptualising feedback received with my own views. A clear remedy for this could have been to reach for a previously tested model and whilst this was partly the case with the Goldman et al (1995) research, although the framework appeared relevant, a survey tool which was relevant to services simply did not exist. Consequently the survey I designed was a direct manifestation of my own learning from the extant literature but with the aim of bridging the identified failings in the Goldman model.

It was also evident from the second phase of the study when I interviewed industry participants that their views on agility were stilted, particularly at the lower end of the hierarchy and this does vindicate provision of a questionnaire shaped by my interpretation of the literature. When analysing the interview transcripts and relistening to the recordings, it did occur to me that practitioners were often using word-patterns that denoted uncertainty or 'haziness' which I regarded as frustrating since it undermined my desire for truth-seeking, but later the significance of this became a key element of the study. Views were often inconsistent with the literature and the survey which simply underscores the problematic nature of providing an explanation and is a manifestation of 'actors' providing accounts that describe their unique perspective on agility. The follow-on interviews did form a framework for how practitioners conceptualise agility and this experience did allow me to re-evaluate my own philosophical stance in relation to the phenomenon.

Blaxter et al (2006) highlight the need for researchers to be cognisant of their own impact on the learning environment and how this extends into the way the study is conducted such as the framing of questions and the significance attached to certain responses. Whilst awareness of my own influence was negligible at the outset, this intensified as the study gained momentum, meaning I had views that were being shaped as more literature was covered. Given the extensive nature of the literature, such diversity had a moderating effect on my own biases, however more credence was undeniably afforded to the Goldman et al (1995) but even this dissipated to a large degree as I reached the conclusion that the knowledge base had moved on since original publication. This meant the questionnaire was *constructed* using the Goldman audit as a foundation, but augmented with more relevant questions drawn from the literature, but in an attempt to be as objective as possible, the question bank was reviewed by both of my supervisors, two further academic staff at the university and a fellow PhD student. Whilst this cannot guarantee objectivity in the purest sense it does help to safeguard against 'tainting', though Denzin and Lincoln (1998) suggest

the researcher should not be disentangled from the observed activity in formulating a construct. When considering the interview outcomes, the issue of researcher influence is identified by Seymour and McCabe (2007) who argue researchers find acceptance of outcomes difficult if they do not concur with their preconceived views or experience. I was also mindful of the impact my own frame of reference might have on outcomes, as a consequence of esoteric knowledge acquired through review of the literature but this was balanced by the need to build an understanding of the complexity associated with agility by eliciting 'stories within' (Seymour and McCabe *ibid*).

The issue of access created problems in the early stages of the research, particularly around building a sample. This did start to concern me and I was starting to believe a contingency of focusing only on financial firms, where I have an established network of contacts, might be a sensible strategy. The arrival of Midland Heart (MH) was serendipitous as they had approached the University asking if there were any specialists in the field of agility. After a discussion with the Finance Director and Head of Change and Transformation (HCT), it was felt there would be mutual benefit in the organisation taking part in the study. I was also mindful of the views of Fetterman (2010) that participation is often fortuitous and the importance of securing an opening by any means. I do acknowledge the bias created within the survey by the differential access provided by MH management but this was perhaps an inevitable consequence since an organisation seeking insights will naturally work harder to make sure questionnaires are completed. This is however a matter of conjecture since all organisations taking part were given the same instructions to aspire to twenty questionnaire completions, from a range of management strata, which MH did achieve. Whilst 37.5% of survey responses were from MH, I accepted this on the basis that, particularly at the interview stage, individuals *experiencing* an organisation with agile ambitions would be very insightful and this was a motivating factor in choosing to interview the HCT. This is supported by the question posed by one of my supervisors and that of Denzin and Lincoln (1998) around trying to establish exactly what those engaged in agility 'thought they were up to'. Moreover I wanted to guard against merely critiquing the Goldman work, without the intellectual insight from practitioners, thus allowing the disaggregation of theory and practice. This is consistent with the views of Rooke et al (2009) who regard using varying techniques for different organisations as perfectly legitimate. The fundamental premise of the study was to understand more around the hallmarks of an agile organisation and the views of practitioners are equally if not more relevant than

theorists, but one vital outcome from the MH involvement was to ratify the importance of structure to the agile firm, particulalrly relating to information sharing. The inherent failure at MH to remain committed to the agile agenda was contributed to by the dysfunctional nature of information exchange within the organisation.

In discussing studies with my youngest son, an accomplished artist, he talked about an issue which plagues those attending art galleries; that is stepping back to view a piece of art allows a wider perspective but leads to loss of detail, but moving in too close provides a more granular view, at the expense of seeing the entire work. This proved to be a prophetic metaphor for my reflection on this study. Considering the process holistically, it is apparent agility is an imprecise term and that is contributed to by its complexity, the natural consequence of which is that understanding is non-linear and based around 'fuzzy logic' (Bottani 2009). Agility is however acknowledged as a necessary requirement for the modern organisation and despite its complexity and imprecise nature, several taken-for-granted assumptions such as speed were identified. Recognising the obvious difficulties of trying to assign measurement to such an indistinct and vague topic, it is felt this study has advanced the learning of agility and this is outlined in more detail in the following section.

Contribution to Knowledge

Yauch (2011) suggests previous attempts at measuring agility have fallen short of a single factor which can be applied as means of comparison between organisations and to evaluate the difference between manufacturing and services. The CAM assessment tool seeks to build an understanding of the component parts of agility and provide a means for measurement .This creates an enabler for comparison across industries and assigning a numerical factor which will allow a means of benchmarking organisations.

Traditional measures of organisational success are often evaluated by outputs such as share price performance or financial criteria such as profit and loss. Whilst being cognisant of output measures, the assessment tool seeks to provide clarity around *inputs* and provides a means for measurement. As a basis for a longitudinal study, the process can be repeated at regular intervals to provide insight into

- The extent to which agility factors change
- The transitory nature of the weighed agility factors

- Means of comparing industry differences
- Benchmarking organisations to peers or sector average
- Assessing progress of organisations along the journey to agility

In considering the validity of the CAM, I have reflected on the extent to which the tool is measuring what it was intended. The design of the CAM seeks to capture the key hallmarks of agility drawn from the literature and additionally aims to weight these in terms of importance, allowing comparisons to be made across firms and industrial sectors. Additionally, when used as part of a longitudinal study, it is fully accepted that both the importance weightings and firm performance against these will change but the CAM allows for this recalibration and is therefore dynamic in nature. Given the modest sample size, the CAM carries high internal validity and it may also be high in external validity, though this would need to be substantiated by testing on a larger sample. The tool is weak in predictive validity although this might be improved with longer term trend analysis as part of the longitudinal study though changes in the relative importance of agility traits over time could only be understood by further ethnographic study i.e. a repeated survey will detect a change in weighting, but not the underlying reasons.

When constructing this, I was mindful of the views of Geertz (1973) who elucidates the fallibility of assuming the world is defined by social facts which can be simply captured by the researcher. Thus my role evolved to chart the social discourse of actors into a making some sense of their experiences for a general meaning. That said I believe understanding the relative importance of agility factors will have commercial application for industry since it can provide guidance on appropriateness of resource allocation to maximise ‘added value’. This will overcome an issue identified by Saaty (1980) that decision making is impeded when there are multiple factors and the decision-maker lacks clarity around the relative importance attached to each factor.

The methodological basis for this study evolved. The four pillars of agility posited by Goldman et al (1995) is used as the over-arching structure because it represents an established model, albeit with foundations in the manufacturing arena, and is the most commonly cited material across the academic literature. As the study developed however, I became less comfortable with pursuit of this single methodological approach as the nature of the phenomenon was clearly contested. This led me to extend the scope of the study to adopt a more constructivist approach to elicit the views of those in industry supposedly using or aspiring to agility as part of

their working lives. In this respect, one organisation in particular, Midland Heart has a stated aim of becoming more agile as one of its strategic priorities and this created the opportunity to ask people working there what they thought this might mean for them and how this might differ for the organisation collectively and individually from what they did now. Abductive enquiry allowed me to explore more fully what practitioners thought it might mean to become more agile by citing examples of firms perceived to be so and identifying hallmarks. This caused me to question the literature base and more specifically critique the Goldman research leading to a more relevant model for the modern services organisation.

Summary

One of the key learning points from the study is trying to reconcile the need to make a worthwhile contribution to knowledge with not being overly ambitious. As the programme advanced it became evident to me that doctoral research can be relatively narrow and should overtly avoid a more generalist approach. Inextricably linked to this is a realisation that robust research using sound methodology can actually facilitate generalisation in any event but this was one of the defining differences from study at Masters level where a more descriptive bias is tolerated, in contrast to doctoral where expectation is highly analytical. This is difficult for me to reconcile with the agility issue since it is apparent, particularly from the interviews, that there is a lack of familiarity with the term, what this means for business and there certainly appears to be no appreciation of the complexity associated with it.

It is evident that agility cannot easily be defined but there seems to be coherence that the phenomenon is a combination of characteristics which are idiosyncratic to each organisation. Moreover, there is no clarity as to what the components are and additionally these are themselves hard to define, for example innovation which is regarded as a primary component of agility from the interviews, but this itself is conflated with ‘first mover’. Despite this lack of rationality, imprecise meanings and definitions, the study does aim to categorise the components and use this as a basis for measurement.

Constructivism assumes knowledge is built without reference to empirical data, baseline models or cognitive categories but creates an issue of relativism where any model is seen as equally valid making the distinction of true knowledge from false arbitrary. This view is reconciled by individual constructivism where we reach

coherence across varying knowledge bases with the result that we reject those inconsistent with our own and maintain those which help integrate previously incompatible concepts. This is reflective of the diversity of literature I cover as part of the process which does heighten my awareness of agility components and allows me to be more dispassionate about what I feel might be less relevant. In conducting the qualitative element of the study however, social constructivism seems more relevant with those concepts on which the majority of a social group agree gaining credence.

The next chapter is divided into two parts the first laying out the numerical or quantitative data with the second dealing with the qualitative data, which as mentioned was not part of the original study plan, but assumed a much greater resonance as the study progressed and the inherent ambiguities engrained within the phenomena became more apparent.

Chapter Four

Data Presentation

Introduction

This chapter is divided into two primary sections, presenting the data from the quantitative analysis first and the key themes emerging from the qualitative part of the study in the second. Reconciliation of the two research methods is considered in chapter five. The quantitative data is opened with frequency analysis to provide some breakdown of response patterns and this is followed by normality and reliability tests which aim to make an assessment over how robust the data is. The presentation of survey responses is structured using the (Goldman et al, *ibid*) four pillars in order to retain a theme running through the entire thesis but additionally, each pillar will contain a sub-section – differences between variables and relationship between variables. In the case of the qualitative data presentation, several views of participants were conflicting and this is to be expected within a constructivist paradigm since reality is a manifestation of the minds of the actors, though all are meaningful. Because the aim was to draw out the key themes emerging from the interviews, this section deals with commonalities and in the interests of brevity does not analyse contested themes. It is not structured using the four pillars since not all were represented, with each of the emerging characteristics presented under its own heading.

Quantitative Data

The data analysis is divided into seven key elements, the first three being frequencies, normality and reliability tests. The chapter then resumes with data presented using the four pillars structure used in chapter three but each is subdivided to look at responses to agility trait questions, including any differences emerging within the hierarchies and then looking at differences between variables (ANOVA) and relationships between variables (correlation). The narrative highlights the difference between items of statistical difference and those that don't with more emphasis on the former. The quantitative data also aims to build an understanding of the relative importance of each of the identified agility characteristics and whilst chapter four includes some reference to this, most of the quantitative data is contained in appendix 7.

Since information was elicited using questionnaires asking respondents to quantify their perceived level of importance in relation to agility factors, this is ordinal data which necessarily restricts quantitative analysis to non-parametric tests. Although Kinnear and Gray (2004:9) regard data in the form of ratings to be 'a grey area' they do conclude that a non-parametric route is the only one for ordinal data. Fetterman (2010) further argues that non-parametric tests are more suitable when sample sizes are modest.

Survey responses are used to populate the CAM using Excel (2010) and additionally input into SPSS v19 to allow correlation analysis and ANOVA to be undertaken. Quantitative data are then analysed using a mix of descriptive, inferential statistics (though the latter was limited) and inter-relationships. Breu et al (2001) use multivariate analysis when considering workforce agility, suggesting this is particularly useful when dealing with large numbers of variables and more widely used in social science when concepts are complex or immaterial in nature. The temptation within this study is to devise a model involving numbers and present the outcomes as a 'truth-claim' as a measure of agility. My own failing in the early part of the study, was to overlay the philosophies of the natural sciences in the attempt to quantify and find plausible explanations but this presupposes agility is built around finite characteristics each of which is open to precise measurement. This is in itself enrichment for me, but also appears to be fully consistent with the 'fuzzy logic' posited by Bottani (2009) in relation to agility.

Within the data gathered for this study, there are differences in sample sizes and evidence of non-normal distribution (skewness), meaning conditions for parametric tests such as t-test and ANOVA are violated. Kinnear and Gray (2004) suggest parametric tests are more robust and unless there is pronounced skewness in the data, these should be used, however since the data I collected is ordinal (attitudinal), alternative non-parametric tests are performed using Mann-Whitney tests for two data sets (public versus private sector) and Kruskal-Wallis tests for three or more groups (firm comparisons, management level comparisons and length of service comparisons). According to Pallant (2007), Mann-Whitney and Kruskal-Wallis are similar in nature since both convert ordinal data into ranks, with the mean rank compared.

A series of Mann-Whitney tests was run to test the statistical significance between two groups (private and public sector) in relation to each agility trait. According to Pallant (*ibid*), whilst Mann-Whitney helps to identify the significance level in relation to the difference between two data-sets, this does not identify 'the direction of the difference' so where a significant difference occurs, further tests were run in SPSS to identify the median value for each group and the effect size using Cohen criteria in Pallant (*ibid*), which aims to measure the strength of association by comparing the extent to which the group means differ.

This chapter makes reference to the importance scores from questionnaires but full commentary and tables relating to each question response are included in appendix 7. Data is presented in two ways, the first being to consider the percentage of respondents attaching a greater than neutral significance level (a score of 6 or higher) and the second reviewing the percentage regarding a particular agility trait as highly important (a score of 9 or 10). Further analysis to test statistical significance between correlation coefficients across participating firms, managerial layers and the time served with the respective organisations cannot be performed due to the limited sample size evident with each group but could be considered as part of the longitudinal study which follows this research, on the assumption that sample sizes would be more robust.

Frequency Analysis

Before analysis, categorical data was checked for error which confirmed the 40 valid responses. The coding ranges were also checked to ensure no rogue entries existed and this confirmed a range of 1-6, representing the six participating organisations.

Frequencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Midland Heart	15	37.5	37.5	37.5
	2 IPScape	7	17.5	17.5	55.0
	3 Worcestershire County Council	6	15.0	15.0	70.0
	4 Halifax Sharedealing	6	15.0	15.0	85.0
	5 CDC Wealth Management	3	7.5	7.5	92.5
	6 Cape Hill Medical	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Table 5 Frequency Analysis (organisational level)

At a firm level, the response rate varies significantly, with 15 responses from Midland Heart and only 3 each from CDC and CHM. I acknowledge that the number of respondents is weighted towards those from Midland Heart, but I regarded their involvement as important since the organisation had explicitly stated that part of the strategy was to become 'more agile'. This was a good opportunity to test what workers felt being agile involved, about the journey and the success or otherwise of the initiative. For some analyses such as ANOVA, it is desirable to have roughly equal group sizes and small groups invalidate some techniques. At a management level, categories were more evenly distributed and the split between public and private sector were almost exactly even.

Private or public

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Private	19	47.5	47.5	47.5
	2 Public	21	52.5	52.5	100.0
	Total	40	100.0	100.0	

Table 6 Frequency Analysis (sector)

Managerial level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Board Level	5	12.5	12.5	12.5
	2 Senior Manager	10	25.0	25.0	37.5
	3 Middle Manager	11	27.5	27.5	65.0
	4 Non Manager	14	35.0	35.0	100.0
	Total	40	100.0	100.0	

Table 7 Frequency Analysis (managerial level)

A test was also carried out on the continuous data in relation to the assessment of importance of agility traits to check there were no obvious erroneous entries for minimum and maximum score. Whilst the mean cannot be used for analysis in ordinal data (Birch 2012), it does allow a sense-check to ensure positioning within the range of scores, which proved to be the case. In the case of the 19 agility traits identified and measured, most were positioned towards the higher end of the range, with the exception of configuration.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Solutions	40	1	10	7.83	2.395
Innovation	40	3	10	7.42	1.893
AssimilatingInfo	40	0	10	8.63	2.350
Customisation	40	1	10	6.78	2.626
Configuration	40	0	10	5.83	3.071
Control	40	0	10	6.47	2.602
SpeedResponse	40	7	10	9.17	.958
SupplyChain	40	4	10	8.30	1.620
ChangeMgt	40	6	10	8.60	1.105
AdaptiveStrategies	39	6	10	8.49	1.335
AlliancesPartners	39	5	10	7.74	1.371
DistinctiveCapability	40	0	10	6.47	2.501
EvalEnvironment	40	6	10	8.87	1.223
Unpredictability	40	5	10	8.23	1.387
EnablingEmployees	38	0	10	8.45	2.165
Motivating	40	3	10	8.13	1.697
NuturingComp	40	4	10	8.43	1.430
ExploitingInfo	39	0	10	8.31	1.838
Culture	40	0	10	8.15	2.815
Valid N (listwise)	35				

Table 8 Descriptive Statistics (agility traits)

Running descriptive statistics also enables me to make an assessment of any missing data for each of the variables and whether this is disproportionate for any particular variable. Of 40 possible responses to each of the agility characteristics, the lowest is 38 for ‘enabling employees’, with only one omission each for ‘adaptive strategies’, alliances and partnerships’ and ‘exploiting information’. For analysis, missing data cases are excluded pairwise i.e. excludes from analysis only the omitted information and retains all elements where a relevant response was furnished.

Normality Tests

Continuous data is also assessed for normality to check the assumption that response patterns were distributed symmetrically with a weighting around the centre and lower frequency towards the two ‘tails’.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Solutions	40	1	10	7.83	2.395	-1.291	.374	1.039	.733
Innovation	40	3	10	7.42	1.893	-.606	.374	-.141	.733
AssimilatingInfo	40	0	10	8.63	2.350	-2.717	.374	7.910	.733
Customisation	40	1	10	6.77	2.626	-.556	.374	-.236	.733
Configuration	40	0	10	5.83	3.071	-.889	.374	-.366	.733
Control	40	0	10	6.48	2.602	-1.005	.374	.512	.733
SpeedResponse	40	7	10	9.18	.958	-.922	.374	-.139	.733
SupplyChain	40	4	10	8.30	1.620	-.782	.374	.062	.733
ChangeMgt	40	6	10	8.60	1.105	-.327	.374	-.732	.733
AdaptiveStrategies	39	6	10	8.49	1.335	-.426	.378	-.910	.741
AlliancesPartners	39	5	10	7.74	1.371	-.155	.378	-.262	.741
DistinctiveCapability	40	0	10	6.47	2.501	-1.092	.374	.970	.733
EvalEnvironment	40	6	10	8.87	1.223	-.811	.374	-.335	.733
Unpredictability	40	5	10	8.23	1.387	-.547	.374	-.277	.733
EnablingEmployees	38	0	10	8.45	2.165	-2.287	.383	5.979	.750
Motivating	40	3	10	8.13	1.697	-.868	.374	.692	.733
NuturingComp	40	4	10	8.43	1.430	-.810	.374	.732	.733
ExploitingInfo	39	0	10	8.31	1.838	-2.546	.378	10.253	.741
Culture	40	0	10	8.15	2.815	-2.026	.374	3.549	.733
Valid N (listwise)	35								

Table 9 Analysis of continuous variables (including skew and kurtosis)

It is evident that the skewness of the data which relates to the symmentry of distribution is negative across all agility traits, suggesting a skew in responses towards higher scores but according to Pallant (2007) this is not uncommon when measuring emotive issues, or within the social sciences generally. The Kurtosis statistic provides information on the 'peakedness' of the data with 0 indicating perfectly normal distribution, though according to Pallant (*ibid*) this is uncommon in the social sciences. The use of information (both assimilating and exploiting) reveals strongly positive kurtosis, suggesting scores clustered, with the tails being under-represented. This contrasts with adaptive strategies which exhibits the most negative

kurtosis score, normally suggestng too many responses residing in the extremes but this was modest at -0.9.

Checking Reliability

Internal consistency refers to the degree to which items that compose a scale 'hang together' (Pallant *ibid*) or the degree to which they all measure the same construct. This is measured using Cronbach's alpha, which according to DeVellis (2003) should exceed 0.7, though this is sensitive to the number of items in the scale, meaning that short scales (Pallant refers to less than 10 items), Cronbach's alpha of 0.5 is not uncommon. To test the relevance to the agility study, Cronbach's alpha is tested using the full scale of agility characteristics (19 items) and the scale for each of the four pillars (4 to 6 items in each).

Case Processing Summary

		N	%
Cases	Valid	35	87.5
	Excluded[a]	5	12.5
	Total	40	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.760	.815	19

Tables 10-11 Checking internal consistency (Cronbachs Alpha) for all agility characteristics

Cronbach's alpha for all items is 0.76 which lies within the 0.7-0.8 acceptability range. Within the inter-item correlation matrix there is evidence of negative scores, a common cause being omission of reverse coding for negatively worded questions, but this is not relevant to part 1 of the questionnaire as there are no negatively worded questions. Further analysis of the 'item total scale' however reveals no negative scores within the 'corrected item total correlation' scores. Field (2006) advises viewing 'Cronbach's Alpha if item Deleted' and suggests the resultant score

for a deleted item should not dramtically increase or decrease the overall alpha score. I the case of all agility components, it does not and this coupled with an overall Cronbach's alpha exceeding 0.7 negate the need to remove items with low correlation scores.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Solutions	142.94	255.879	.178	.638	.765
Innovation	143.11	242.281	.542	.770	.736
AssimilatingInfo	141.89	258.692	.219	.549	.758
Customisation	143.63	250.887	.231	.717	.761
Configuration	145.06	254.820	.113	.471	.780
Control	144.14	257.303	.144	.701	.770
SpeedResponse	141.43	265.017	.354	.783	.753
SupplyChain	142.31	249.575	.441	.759	.743
ChangeMgt	141.97	263.382	.325	.595	.753
AdaptiveStrategies	142.11	253.869	.475	.732	.744
AlliancesPartners	142.77	255.593	.436	.660	.746
DistinctiveCapability	144.34	231.055	.504	.769	.734
EvalEnvironment	141.80	253.871	.512	.871	.743
Unpredictability	142.43	246.546	.614	.846	.736
EnablingEmployees	142.17	245.617	.370	.778	.747
Motivating	142.43	244.017	.562	.776	.736
NuturingComp	142.11	258.222	.373	.784	.749
ExploitingInfo	142.29	242.916	.511	.878	.737
Culture	142.37	250.887	.227	.802	.762

Table 12 Checking internal consistency (item total scale)

Reliability tests are also presented for each of the four pillars. These range from 0.4 (Structure) to 0.65 (People). It should be remembered that Cronbach Alpha is sensitive to the size of the scale (Pallant 2007:95) meaning with shorter scales of less than ten items, as with the four pillars, low values are common.

Scale: Reliability (Customer)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.582	.588	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Solutions	22.83	23.533	.401	.332	.480
Innovation	23.23	26.640	.428	.210	.478
AssimilatingInfo	22.03	28.281	.192	.141	.640
Customisation	23.88	20.471	.472	.296	.412

Tables 13-14 Checking internal consistency (Cronbachs Alpha) for customer pillar

Scale: Reliability (Structure)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.400	.476	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Configuration	40.97	19.710	.191	.215	.398
Control	40.36	20.131	.330	.213	.238
SpeedResponse	37.59	32.143	.138	.134	.389
SupplyChain	38.46	29.676	.125	.296	.391
ChangeMgt	38.18	31.467	.151	.384	.383
AdaptiveStrategies	38.28	28.366	.313	.147	.312

Tables 15-16 Checking internal consistency (Cronbachs Alpha) for structure pillar

Scale: Reliability (Co-operation)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.601	.669	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AlliancesPartners	23.62	15.874	.333	.198	.567
DistinctiveCapability	24.85	9.818	.330	.198	.677
EvalEnvironment	22.49	15.362	.463	.431	.503
Unpredictability	23.13	13.483	.576	.442	.412

Tables 17-18 Checking internal consistency (Cronbachs Alpha) for cooperation pillar

Scale: Reliability (People)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.646	.672	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
EnablingEmployees	33.32	25.781	.464	.377	.559
Motivating	33.65	28.790	.505	.622	.553
NuturingComp	33.32	32.614	.379	.491	.610
ExploitingInfo	33.43	29.252	.403	.275	.592
Culture	33.51	25.757	.324	.302	.654

Tables 19-20 Checking internal consistency (Cronbachs Alpha) for people pillar

The pillar with the lowest Cronbach value is structure at 0.4 but checking the 'item total statistics', none of the values 'if item deleted' exceeds the overall Cronbach Alpha value, which suggests removal of any item would not improve the overall value for the subset (Field 2006). This coupled with other pillar scores exceeding 0.5 and a collective alpha exceeding 0.7 suggest all items are consistent with the construct.

I now present the numerical data, split along the four pillars of agility used as a constant theme throughout this study, starting with the importance of 'customer'.

Customer

Difference between Variables

Whilst Mann-Whitney tests are useful for comparing two grouping variables (Private and Public Sector), I also wish to make comparisons across other groupings to test for differences and this is achieved using Kruskal-Wallis tests, which allow comparison across three or more groups (Pallant 2007:226). Given the ordinal nature of the data, non-parametric tests are used which have less demanding assumptions but the two main criteria are fulfilled:

1. Random samples – questionnaires are completed by participants not chosen by the researcher with the only stipulation given to the organisation for a stratified sample across managerial layers
2. Independent observations – each participant is included only once and does not appear in more than one group

Kinnear and Gray (2004) suggest the non-parametric equivalent of ANOVA helps to overcome the issue of heterogeneity of variance and non-normal distribution. Kruskal-Wallis tests were completed to compare the responses on agility traits by organisation, managerial layer and time spent with the organisation. There is no evidence of significant differences in responses across firms and only innovation proves to be of significance across management layers. There is evidence of difference between groups when analysing time spent with firm with significant results achieved across three traits – innovation, customisation and dealing with unpredictability (although this was marginal at 0.051significance level).

Within the customer element of agility, only solutions yields a statistically significant result p = 0.027, which is less than 0.05 meaning the difference between the private and public sector is significant and not due to chance.

Test Statistics[b]

	Solutions
Mann-Whitney U	119.500
Wilcoxon W	309.500
Z	-2.214
Asymp. Sig. (2-tailed)	.027
Exact Sig. [2*(1-tailed Sig.)]	.029[a]

a. Not corrected for ties.

b. Grouping Variable: Private or public

Ranks

	Private or public	N	Mean Rank	Sum of Ranks
Solutions	1 Private	19	16.29	309.50
	2 Public	21	24.31	510.50
	Total	40		

Report

Solutions

Private or public	N	Median
1 Private	19	8.00
2 Public	21	9.00
Total	40	8.50

Tables 21-23 Mann Whitney tests for significance between private and public sector responses (solutions)

Reviewing the mean rank suggests the higher score lies within the public sector but the median values for each group are Private = 8 and Public = 9. The effect size, or strength of association which according to Pallant (2007) is a measure of the relative magnitude of the mean differences, where z = -2.21 and n = 40, thus

$$r = \frac{-2.21}{\sqrt{40}} = -0.35$$

This would be considered a medium effect size according to Cohen. In summary the results can be presented as follows:

A Mann-Whitney U test reveals significant difference in the response to Solutions between the private sector (*Md* = 8, *n* = 19) and public sector (*Md* = 9, *n* = 21), *u* = 119.5, *z* = -2.21, *p* = 0.027, *r* = -0.35.

There is a statistically significant difference in the continuous variable (innovation score) across the four managerial levels. Looking at the mean rank suggests senior managers place a higher importance on innovation as a component of agility, with non-managers recording the lowest. Using eta squared (Chi/df) it can be established that 23% (9.139/39) of the difference in mean rank can be accounted for by group membership.

Ranks

	Managerial level	N	Mean Rank
Innovation	1 Board Level	5	21.70
	2 Senior Manager	10	29.20
	3 Middle Manager	11	18.64
	4 Non Manager	14	15.32
	Total	40	

Test Statistics[a,b]

	Innovation
Chi-Square	9.139
df	3
Asymp. Sig.	.027

a. Kruskal Wallis Test

b. Grouping Variable: Managerial level

Report

Innovation

Managerial level	N	Median
1 Board Level	5	8.00
2 Senior Manager	10	8.50
3 Middle Manager	11	8.00
4 Non Manager	14	7.00
Total	40	8.00

Tables 24-26 Kruskal Wallis tests for significance across managerial levels (innovation)

A Kruskal Wallis test reveals a statistically significant difference in the response to Innovation across the four managerial categories (Gp 1, *n* = 5, Board level, Gp 2, *n* = 10, Senior Managers, Gp 3, *n* = 11, Middle Managers, Gp 4, *n* = 14, Non-Managers), X^2 (*3, n* = 40) = 9.14, *p* = 0.027. Senior Managers record a higher median score (*Md* = 8.5, *n* = 10) Board level (*Md* = 8) Middle Managers (*Md* = 8) and Non Managers (*Md* = 7)

Follow-on tests were conducted to evaluate pairwise differences across the four managerial groups using Mann-Whitney U-tests, controlling for type 1 error by using the Bonferroni approach (restricted the significance level by number of tests completed i.e. 0.05/6 = 0.008) which creates a more stringent significance level.

Ranks

	Managerial level	N	Mean Rank	Sum of Ranks
Innovation	2 Senior Manager	10	17.30	173.00
	4 Non Manager	14	9.07	127.00
	Total	24		

Test Statistics[b]

	Innovation
Mann-Whitney U	22.000
Wilcoxon W	127.000
Z	-2.892
Asymp. Sig. (2-tailed)	.004
Exact Sig. [2*(1-tailed Sig.)]	.004[a]

Tables 27-28 Follow-on Mann Whitney tests for significance across managerial levels (innovation)

Results of these tests reveal a significant difference exists between Senior Managers and Non-managers. The effect size is large at 0.59 according to Cohen (1994):

$$r = \frac{-2.89}{\sqrt{24}} = -0.59$$

There is also evidence of statistical significance in relation to Innovation across the six groups of time spent with the organisation. The mean rank suggests the groups having been with the organisation the longest (11-14 years and 15 years and over) place higher importance on innovation as a component of agility with those having worked for between 6-10 years, recording the lowest. Innovation was also seen as important for those new to the organisation i.e. less than one year. Using eta squared it was established that 29% (11.352/39) of the difference in mean rank can be accounted for by group membership.

Test Statistics[a,b]

	Innovation
Chi-Square	11.352
df	5
Asymp. Sig.	.045

a. Kruskal Wallis Test

b. Grouping Variable: Time with firm

Report

Innovation

Time with firm	N	Median
1 Less than 1 year	5	8.00
2 Between 1 and 2 years	7	7.00
3 Between 3 and 5 years	15	7.00
4 Between 6 and 10 years	2	4.00
5 Between 11 and 14 years	6	8.00
6 15 years or more	5	8.00
Total	40	8.00

Tables 29-30 Kruskal Wallis tests for significance across time with organisation (innovation)

A Kruskal Wallis test reveals a statistically significant difference in the response to Innovation across the six time horizons (Gp 1, *n* = 5, less than 1 year, Gp 2, *n* = 7, between 1 and 2 years, Gp 3, *n* = 15, between 3 and 5 years, Gp 4, *n* = 2, between 6 and 10 years, Gp 5, *n* = 6, between 11 and 14 years, Gp 6, *n* = 5, 15 years or more), X^2 (*5, n* = 40) = 11.35, *p* = 0.045. The two groups with the longest servitude record a higher median score (*Md* = 8, *n* = 11) along with those with the shortest (Md = 8, n = 5). The lowest median score is for the group having worked between 6 and 10 years (*Md* = 4, *n* = 2)

Follow-on Mann-Whitney tests were completed but given there were 6 groups this would lead to 15 individual tests or a Bonferroni adjusted significance level of 0.05/15 = 0.003. With so many groups Pallant (*ibid*) suggests conducting fewer tests to keep alpha at a manageable level so in this case the number of tests was restricted to 5 and an alpha level of 0.05/5 = 0.01 using group 4 (6 to 10 years) as a comparator with the other five groups. This failed to produce a result of significance at the 0.01 level with the test of groups 4 and 5 yielding the most significant at 0.038. Kinnear and Gray (2004: 273) highlight one of the limitations of a Bonferroni test being the failure to yield a significant result from as few as 6 groups.

Ranks

	Time with firm	N	Mean Rank	Sum of Ranks
Innovation	4 Between 6 and 10 years	2	1.50	3.00
	5 Between 11 and 14 years	6	5.50	33.00
	Total	8		

Test Statistics[b]

	Innovation
Mann-Whitney U	.000
Wilcoxon W	3.000
Z	-2.075
Asymp. Sig. (2-tailed)	.038
Exact Sig. [2*(1-tailed Sig.)]	.071[a]

a. Not corrected for ties.

b. Grouping Variable: Time with firm

Tables 31-32 Follow-on Mann Whitney tests for significance across time spent with organisation (innovation)

There is a statistically significant difference in the continuous variable (customisation score) across the six groups of time spent with the organisation. Looking at the mean rank suggests the group having served 6-10 years places a higher importance on customisation as a component of agility with those having worked for between 3-5 years, recording the lowest. Using eta squared it is evident that 30% (11.842/39) of the difference in mean rank can be accounted for by group membership.

Ranks

	Time with firm	N	Mean Rank
Customisation	1 Less than 1 year	5	25.80
	2 Between 1 and 2 years	7	17.07
	3 Between 3 and 5 years	15	14.07
	4 Between 6 and 10 years	2	31.25
	5 Between 11 and 14 years	6	28.50
	6 15 years or more	5	25.40
	Total	40	

Test Statistics[a,b]

	Customisation
Chi-Square	11.842
df	5
Asymp. Sig.	.037

a. Kruskal Wallis Test

b. Grouping Variable: Time with firm

Report

Customisation

Time with firm	N	Median
1 Less than 1 year	5	7.00
2 Between 1 and 2 years	7	5.00
3 Between 3 and 5 years	15	5.00
4 Between 6 and 10 years	2	9.00
5 Between 11 and 14 years	6	9.00
6 15 years or more	5	9.00
Total	40	7.00

Tables 33-35 Kruskal Wallis tests for significance across time with organisation (customisation)

A Kruskal Wallis test reveals a statistically significant difference in the response to Customisation across the six time horizons (Gp 1, *n* = 5, less than 1 year, Gp 2, *n* = 7, between 1 and 2 years, Gp 3, *n* = 15, between 3 and 5 years, Gp 4, *n* = 2, between 6 and 10 years, Gp 5, *n* = 6, between 11 and 14 years, Gp 6, *n* = 5, 15 years or more), X^2 (*5, n* = 40) = 11.84, *p* = 0.037. The three groups with the longest servitude record a higher median score (*Md* = 9, *n* = 13) with the lowest being between 1 and 2 years and 3 to five years (*Md* = 5, *n* = 22)

Follow-on Mann-Whitney tests were completed but restricted to main effect tests initially to keep alpha at a manageable level of 0.05/5 = 0.01 using group 3 (3 to 5 years) as a comparator with the other five groups. This produced a borderline significant result at the 0.01 level with the test of groups 3 and 5 (11-14 years) showing a significance level of 0.015. The effect size was large at 0.53:

$$r = \frac{-2.44}{\sqrt{21}} = -0.53$$

Ranks

	Time with firm	N	Mean Rank	Sum of Ranks
Customisation	3 Between 3 and 5 years	15	8.93	134.00
	5 Between 11 and 14 years	6	16.17	97.00
	Total	21		

Test Statistics[b]

	Customisation
Mann-Whitney U	14.000
Wilcoxon W	134.000
Z	-2.442
Asymp. Sig. (2-tailed)	.015
Exact Sig. [2*(1-tailed Sig.)]	.014[a]

a. Not corrected for ties.

b. Grouping Variable: Time with firm

Tables 36-37 Follow-on Mann Whitney tests for significance across time spent with organisation (customisation)

Relationship between Variables

Given the ordinal nature of the data being analysed, the parametric version of correlation analysis (Pearson) is unsuitable, meaning Spearman's rho is used which meets the requirements relating to ordinal data and rating scales such as Likert (Pallant 2007). The results generated from a Spearman rho correlation are interpreted in the same way as the parametric equivalent. Undertaking correlation analysis between a large number of variables can yield unwieldy results (Pallant *ibid*:134) but this is avoided by first using the four grouping variables identified by Goldman et al (1995) to establish the strength of relationship within each one i.e. in the case of 'Customer' whether there is significant correlation between solutions,

innovation, assimilating information and customisation. Any missing data is excluded pairwise so as not to restrict N. The resulting tables are presented in appendix 6.

All components within the 'customer' variable are positively correlated, with the strongest being evident between solutions and customisation which exceeds 0.5 and is defined as large according to Cohen (1994:79-81). This suggests respondents identify a symbiotic relationship to the extent that a significant way in which organisations provide solutions is predicated upon a strong emphasis on being able to customise. The significance level does not determine the level of association, but indicates the level of confidence the reader should have in the outcome. This is influenced by sample size with Pallant (2007) suggesting samples of less than 30 often fail to reach statistical significance but with larger samples, even modest correlations can carry significance. There is also medium level (Cohen 1994) correlation of .399 between solutions and innovation, which suggests innovation plays a significant role in shaping the customer proposition and this was strongly reinforced within the interviews.

The coefficient of determination determines the level of variance shared between two variables. In the case of solutions and customisation this is $0.512^2 = 0.262$ meaning 26% variance is shared by these variables and for innovation and solutions this is $0.399^2 = 0.159$ or almost 16% shared variance. In conclusion there is a strong positive correlation between solutions and customisation, $p < 0.01$, and a medium positive correlation between solutions and innovation, $p = 0.011$, $n = 40$.

Spearman rho analysis was also undertaken to compare the correlation coefficients across the private and public sectors. Within the customer element of agility, the correlation coefficient between innovation and solutions is 0.616 for the private and 0.242 for public sector. This difference was tested for statistical significance by assessing the probability that any difference in observed correlations between the groups could be as a result of sampling error. From the four assumptions made for the test, two (random and independent samples) are satisfied and two are partially met. Those partially met are normal distributions (satisfied for innovation but not for solutions) though Pallant (2007: 138) suggests 'approximate' normality, and 20 cases within each group (n = 19 private, n = 21 public) appears to satisfy the requirement.

The r scores were converted to z values using Fishers r to z transformation presented in Pallant (*ibid*: 139/40), with the resultant z value of 1.37 suggesting no statistical difference exists within the two correlation coefficients, meaning the null hypothesis cannot be rejected i.e. difference is due to sampling rather than a fundamental variance in the strength of relationship between private and public sectors. The same procedure was repeated for the correlation coefficients for assimilating information and customisation between private (r = 0.252) and public sectors (r = -0.072) which resulted in a z value of 0.96, again suggesting no statistically significant difference.

Structure

Difference between Variables

No characteristics show significance at the 0.05 level with the exception of Supply Chain at 0.051. Pallant (2007) suggests the low incidence of significance could be due to the modest sample size in each group. Since small samples can belie a statistically significant result, even when the difference in scores between groups is seemingly substantial, though the higher incidence of significant scores from the Kruskal-Wallis tests (see later), where groups were smaller, tended to contradict this. The test result is as follows:

Ranks

	Private or public	N	Mean Rank	Sum of Ranks
SupplyChain	1 Private	19	16.82	319.50
	2 Public	21	23.83	500.50
	Total	40		

Test Statistics[b]

	SupplyChain
Mann-Whitney U	129.500
Wilcoxon W	319.500
Z	-1.952
Asymp. Sig. (2-tailed)	.051
Exact Sig. [2*(1-tailed Sig.)]	.057[a]

a. Not corrected for ties.

b. Grouping Variable: Private or public

Report

SupplyChain

Private or public	N	Median
1 Private	19	8.00
2 Public	21	9.00
Total	40	8.00

Tables 38-40 Mann Whitney tests for significance between private and public sector responses (supply chain)

The effect size for this test is as follows and is also medium effect using Cohen (1994) scale.

$R = \frac{-1.95}{\sqrt{40}} = -0.31$

The summary results for the test (Supply Chain) can be presented as follows:

A Mann-Whitney U test reveals significant difference in the response to Supply Chain between the private sector (*Md* = 8, *n* = 19) and public sector (*Md* = 9, *n* = 21), *u* = 129.5, *z* = -1.95, *p* = 0.051, *r* = -0.31.

Relationship between Variables

In the case of Structure, the strongest correlation is between supply chain and change management, suggesting the efficacy of change management programmes is contingent upon the overall supply chain. Rho = .527, n- 40, p < 0.01. This is classified as a large correlation using the Cohen (*ibid*) scale. The coefficient of determination equates to 0.277, or approximately 28% shared variance. There is evidence of negative correlation between the configuration of the organisation and speed of response (-0.59), supply chain (-0.108) and change management (-0.148), suggesting that all three can be inhibited by the way in which the organisation is structured although these scores were not significant at the 0.05 level, p>0.05. Correlation analysis for the structure element of agility is presented in appendix 6 due to space and sizing issues.

Spearman rho correlation analysis was also completed to establish the strength of the relationship between the three patterns of change identified from the literature –

adaptive strategies, change management and dealing with unpredictability. Although the latter has been categorised within the 'co-operation' pillar (Goldman et al, 1995), it has been brought forward in this instance so comparisons can be made with disruptive and adaptive change patterns.

The test reveals positive, medium strength correlation between all elements with the strongest being adaptive strategies (modest change) and dealing with unpredictability (unpredictable change), $r = 0.403$, $n = 39$, $p < 0.05$, suggesting significance at the 5% level. The coefficient of determination is $0.403^2 = 0.162$, which suggests 16% of the variance in unpredictability is explained by variance in response scores from adaptive strategies. As there appears to be no discernible difference at a macro-level between the perceived importance of the distinct change patterns, which was surprising and inconsistent with the literature, it suggests agile firms need to be adept at managing all three elements of change.

When making comparisons between correlation coefficients across sectors within the structure element of agility, there appear to be a number of differences in r scores which were also tested for statistical significance. Configuration and speed of response (private $r = -0.204$, public $r = 0.112$) give rise to a z score of -0.93, which is not significant and speed of response and change management (private $r = 0.622$, public $r = 0.087$) which also yields a non-significant outcome $z = 1.87$.

There is however statistical significance in the correlation coefficients of configuration and supply chain (private $r = 0.315$, public $r = -0.395$) resulting in a z score of 2.16 which is > 1.96, allowing rejection of the null hypothesis and enabling a conclusion that there is a material difference in correlation between the private and public sector. Within the private sector configuration explains a statistically significant variance in the positive response to the supply chain and negative response within the public sector. Such a difference is additionally evident in relation to change management and the supply chain (private $r = 0.052$, public $r = 0.767$), z score of -2.8, meaning the supply chain has a more limited influence on the response scores for change management within the private sector than in the public, where it holds significant influence.

Co-operation

Difference between Variables

There is evidence of statistical significance in relation to dealing with unpredictability across the six groups of time spent with the organisation, although the significance level was marginal at 0.051. Looking at the mean rank suggests the group having been with the organisation 11-14 years placed the highest importance on dealing with unpredictability as a component of agility, with those having worked for between 3-5 years, recording the lowest. Unpredictability is also seen as important for those new to the organisation i.e. less than one year and those with lengthy service (15 years or more). Eta squared suggests that 28% (11.010/39) of the difference in mean rank can be accounted for by group membership.

	Time with firm	N	Mean Rank
Unpredictability	1 Less than 1 year	5	26.80
	2 Between 1 and 2 years	7	15.86
	3 Between 3 and 5 years	15	14.90
	4 Between 6 and 10 years	2	22.50
	5 Between 11 and 14 years	6	28.67
	6 15 years or more	5	26.90
	Total	40	

Test Statistics[a,b]

	Unpredictability
Chi-Square	11.010
df	5
Asymp. Sig.	.051

Report

Unpredictability

Time with firm	N	Median
1 Less than 1 year	5	9.00
2 Between 1 and 2 years	7	8.00
3 Between 3 and 5 years	15	8.00
4 Between 6 and 10 years	2	8.50
5 Between 11 and 14 years	6	9.50
6 15 years or more	5	9.00
Total	40	8.00

Tables 41-43 Kruskal Wallis tests for significance across time with organisation (dealing with unpredicability)

A Kruskal Wallis test reveals a statistically significant difference in the response to Dealing with Unpredictability across the six time horizons (Gp 1, *n* = 5, less than 1 year, Gp 2, *n* = 7, between 1 and 2 years, Gp 3, *n* = 15, between 3 and 5 years, Gp 4, *n* = 2, between 6 and 10 years, Gp 5, *n* = 6, between 11 and 14 years, Gp 6, *n* = 5, 15 years or more), X^2 (*5, n* = 40) = 11.01, *p* = 0.051. The group with the second longest service period record a higher median score (*Md* = 9.5, *n* = 6). The two lowest median scores are for groups having worked between 1 and 2 and 3 and 5 years (*Md* = 8, *n* = 22)

Follow-on Mann-Whitney tests again restricted to main effect tests initially to keep alpha at a manageable level of 0.05/5 = 0.01 using group 3 (3 to 5 years) as a comparator with the other five groups. This produces a borderline significant result at the 0.01 level with the test of groups 3 and 5 (11-14 years) showing a significance level of 0.015. The effect size was large at 0.53:

$$r = \frac{-2.44}{\sqrt{21}} = -0.53$$

Ranks

	Time with firm	N	Mean Rank	Sum of Ranks
Unpredictability	3 Between 3 and 5 years	15	8.97	134.50
	5 Between 11 and 14 years	6	16.08	96.50
	Total	21		

Test Statistics[b]

	Unpredictability
Mann-Whitney U	14.500
Wilcoxon W	134.500
Z	-2.442
Asymp. Sig. (2-tailed)	.015
Exact Sig. [2*(1-tailed Sig.)]	.014[a]

a. Not corrected for ties.

b. Grouping Variable: Time with firm

Tables 44-45 Follow-on Mann Whitney tests for significance across time spent with organisation (customisation)

Relationship between Variables

When looking at the contributing factors to 'Co-operation', all are positively correlated, with the strongest association being between evaluating the environment and unpredictability (0.488) and unpredictability and distinctive capability (0.471), both of these regarded as medium strength correlation according to Cohen (1994) and can be considered significant at the 0.01 level. The coefficient of determination is 0.238 and 0.221 meaning evaluating the environment and unpredictability share variance of approximately 24%, with the factor between the unpredictability and distinctive capability equating to 22%. This suggests the ability of a firm to withstand unpredictable events explains around a quarter of variance in the scores from respondents in relation to evaluating the environment and distinctive capability.

Within co-operation there is only evidence of one correlation coefficient reaching a statistically significant level – between alliances and partnerships and distinctive capability (private $r = 0.724$, public $r = 0.041$) leading to a z score of 2.55 allowing a conclusion that a statistically significant difference exists. The use of alliances explains significantly more of the variance in score on distinctive capability within the private as opposed to the public sector.

People

Difference between Variables

No evidence of significant difference is found within the people element of agility

Relationship between Variables

In relation to people, all factors are positively correlated with a large correlation effect seen between enabling and motivating employees (0.663) and motivating and nurturing competencies (0.507). The link between enabling and motivating staff appears to be strong in relation to agility with a coefficient of determination of 0.439 or approximately 44% of the variance in motivation scores explained by enabling employees. This represents a strong positive correlation $rho = 0.663$, $n = 38$, $p < 0.01$. There is also evidence of large positive correlation between motivating and nurturing $rho = 0.507$, $n = 40$, $p < 0.01$ meaning responses in relation to motivation are influenced by the commitment to nurturing competencies. Although there is no

evidence of negative correlation in relation to people, the weakest outcome appears to be between culture and enabling employees (0.059), suggesting virtually no correlation.

Differences are evident between sectors within the people dimension of agility, where r scores were also tested for statistical significance. Exploiting information and enabling employees (private r = 0.708, public r = 0.097) gives rise to a z score of 2.19, which is > 1.96, allowing the null hypothesis to be rejected and to conclude a statistically significant difference in correlation exists between sectors. Exploiting information explains significantly more of the variance in response score for enabling employees within the private sector than the public. The statistical significance between exploiting information and culture was also tested (private r = -0.122, public r = 0.520) which results in a z score of 2.01, above the level of 1.96, leading to a conclusion that a statistically significant difference in correlation exists between sectors where culture would appear to explain more of the variance in response to exploiting information within the public sector.

Correlation analysis was completed to test motivation against the three distinct change patterns used in this study which confirms a medium to high level of correlation exists within all three but with the highest for adaptive strategies (rho = 0.411) followed by change management (disruptive) (rho = 0.377) and dealing with unpredictability (rho = 0.375). Correlation analysis suggests medium strength association between competency building and innovation (rho = 0.389) though this appears to be stronger within the public sector (rho = 0.499)

Whilst the original aim of the study was the identification and measurement of agility characteristics to address a gap identified in the literature, what became apparent early in the study was that agility is a collection of attributes, with the exact combination being idiosyncratic to each organisation. This might help to explain why attempts at measurement are hard to come by. It is also evident that many of the components of agility are not only difficult to quantify, but more fundamentally, are themselves difficult to explain and this makes an overall measurement for agile behaviour problematical. In response to this, the scope of the study was broadened to include inductive methods with the aim of trying to identify the *essence* of agility and just what industry players are, or should be, doing to make their organisation agile. The findings of this are presented in the next section, with the most notable feature perhaps the inconsistencies with the outputs from the survey.

Findings from Qualitative Analysis

One pitfall of interviewing is to simply relay speech patterns as a means of solutionising, since meaning cannot be attained solely by a codification process. To overcome this, interviews were recorded and transcribed. Transcripts were reviewed question by question to identify commonality and disparity, with common themes assigned numerical codes and loaded onto a database for analysis, consistent with a study by Becker and Geer (1982) in Bowling (2002). The most commonly arising themes are discussed within the following paragraphs. The process I deployed started with a read-through which was then repeated but this time highlighting comments which appeared relevant. Specific paragraphs or passages of text were labelled and categorised, a system referred to by Fetterman (2010) as 'coding chunks of data' which allows conveyance of better meaning.

Whilst automated categorisation was considered, I decided on the construction of a matrix with collective themes along the vertical axis and individual variables along the horizontal to allow cross referencing and collation with the source of the data. Fetterman (*ibid*) suggests organising the labelling of paragraphs in this manner, improves the grouping of similar examples, with reliability improved since the database can quantify the frequency of common themes emerging. This method was also chosen to overcome an issue identified by Fetterman (*ibid*) around researchers 'standing back' from their work and being more dispassionate. A system of coding can reduce the immediacy of an in depth study. One difficulty here was the immensity of the data collected and only some anecdotal sense of what the common themes might be.

The outcomes from the interviews are presented in two sections, the first being themes which are regarded as important elements for the agile organisation to master and which are fully concordant with the literature, with the second being an emergent issue, which was not previously considered within the extant body of knowledge. Of the 41 survey responses (40 of which were usable), 12 or 29% agreed to take part in the qualitative element and of those 83% were contacted for interview (10), allowing for 2 individuals who withdrew their agreement to be interviewed, and these were drawn from each organisation as follows:

Midland Heart 4

CDC 1

Cape Hill Medical 1

Worcestershire County Council (WCC) 2

IPScape 1

Halifax Sharedealing 1

The aim was to achieve a representative distribution of second stage participants within each managerial group based upon the splits used to distribute questionnaires. This was not possible given the limited number of participants agreeing to be contacted which in itself was not evenly distributed, with senior level survey participants generally showing a greater willingness to be contacted. This is perfectly acceptable since agility is regarded in the literature as more strategic in nature (Hormozi 2001, Sherehiy 2008). Moreover the 'bias' towards higher order hierarchy within the interviews tends to add to the richness of information because, just as senior staff showed a greater willingness to participate, they also tended to have more forthright views on agility. This was however serendipitous as the participants for interviews were only those who expressly volunteered as part of the survey, over which I had no control. I had considered the issue of low acceptance levels to participate in interviews and if this had been the case, I would have recontacted those survey participants (that did not complete anonymously) asking them once again to consider taking part. On balance, I deemed 29% acceptance as legitimate and consistent with numbers in previous agility studies.The distribution of interviewees is as follows:

	Managerial Level			
Organisation	**Board**	**Senior**	**Middle**	**Non**
Midland Heart	1	2		1
CDC	1			
CHM		1		
WCC			1	1
IPScape	1			
Halifax			1	

Table 46 Breakdown of participants for follow-on interviews

The starting point for each interview was to try and provide examples of companies that participants felt were agile, and follow up by trying to isolate which qualities were especially pertinent in bringing about agile outcomes. One of the most frequently cited was Apple and this is inextricably linked to its inclusion within the technology

arena, which was generally seen as an agile sector. One senior manager within the public sector said:

> *I was just trying to think of organisations, I was trying not to think of a technology one but I just struggled, and yes I do think it's an important factor but it's not reliant on that on its own, it's just one element.*

Although the technology sector emerged often as an agile landscape, the only organisation specifically cited was Apple, with a board member within the public sector echoing the views of the senior manager above:

> *Apple, being a prime example of an organisation that springs to mind in the information technology field, I guess that's the key really, when you are in a fast moving environment such as technology you need to be particularly agile because of the rate of knots that technology is moving and really how sensitive the market is to improvements in that technology*

When asked why, one middle manager working for the public sector recalled Apple as an agile firm and highlighted the organisation's ability to deliver a standardised product which can be tailored to an individual's lifestyle:

> *I think the products that they make are probably process driven, but I think what makes them different is that you get their product say you get an iphone, you can bespoke it and are able to adapt it to your lifestyle, your need, so if you are someone who is doing slimming world, you can download a slimming world app, if you are a young person who is into music or wants all the games apps, you can do that*

The issue of agility relating to certain industries appears to be determined by whether agility is demand-led or put another way, shaped by 'pull' factors in contrast to supply-led (push) factors determined by competitive positioning. A middle manager interviewee at Halifax suggested that in dynamic industries, the need for agility is supply led as industry ultimately creates need but in less pioneering industries, agility is demand led but suggested the default was demand:

…..it depends on the individual company or industry. Certain organisations have to create demand but agility is mainly demand led, but with some notable exceptions such as techs which are supply led

This however depends upon market maturity since emergent industries tend to be shaped by suppliers but as demand accelerates, this creates competitive space for new entrants and thus demand driven agility, mirroring the views of Fliedner and Vokurka (1997). CDC is a wealth manager, creating and marketing wealth solutions to ultra-high net worth (UHNW) individuals and this industry is characterised by financial firms creating products and services to protect or enhance wealth or provide shelter from tax and given the idiosyncratic nature of the business, it can never be truly driven by customers as they typically lack esoteric knowledge and thus rely on professionals to proactively suggest suitable solutions. When asked about demand or supply drivers, a board member at CDC suggested:

Equally. Customers want to be valued and trust their provider, which creates demand. Organisations need to learn to under-promise and over-deliver. Demand is created by suppliers, for example the I-phone 4S, customers don't know they have a need so can agility ever truly be shaped by demand ?

This contrasts with IPScape where a significant emphasis emerges of demand side agility drivers, as the telecoms industry is influenced by customer 'pull' for change which industry players need to respond to. Demand drives change amongst organisations and forces firms to think seriously about their agile capability, leading to supply side agility. This would appear to contradict the view of Halifax around demand factors being more prevalent in less pioneering industries. The board member at IPScape suggested:

Agility is driven by customer experience in Telecoms where demand is driving lots of change forcing firms to think about whether they are agile and this leads to supply side agility

The other feature making Apple agile is the issue of first-mover advantage, which appears to be a common feature amongst frequently cited firms, though not the most commonly identified single trait. When asked why Apple is agile, a non-manager from the public sector suggested:

Definitely their technology, their foresight with the market, they are completely one step ahead, technology-wise than their competitors…… they actually know what the customers want ….. they understand what markets are actually wanting and know the costs associated with that and they are providing the product.

Whilst first mover was commonly used as being associated with the technology sector, the connotation was far wider, with a senior manager at MH highlighting the importance in the commercial world generally:

If you are not looking for those opportunities of where things should go someone will get there before you then they've got that commercial and competitive advantage which is really difficult to keep up with isn't it?

Another area identified as having agile characteristics is the financial sector, largely as a consequence of constantly seeking to exploit first mover advantage. Interestingly the example of the financial sector did not emanate from the financial services firms participating in the study, but was from a board level employee at MH who linked the sector to agility through first mover, but even this had hallmarks of a technology link:

one that particularly springs to mind is investment institutions, particularly again in an environment where financial transactions are increasingly complex and changing and subject to so many variables as well, you clearly need to be agile to respond to world economies and the like, so certainly information technology and financial, in my view are two that I would rate top in terms of needing to be very agile……Well it's always about staying one step ahead so with financial institutions having the best, most knowledgeable individuals. In technology, spending the time in research and having the best people and the best ideas of course.

One surprising inclusion in the roll-call of perceived agile companies is Virgin but this emerged on a number of occasions with senior, middle and non-managers all regarding the group as agile, though the senior manager at MH suggested it was the ability to rapidly spot opportunity:

Why Virgin ? I think they are quick to seize opportunities, I think they are very quick to establish the brand and the conditions, so if you think about what they have just done now taking over Northern Rock. If you go on the Virgin website there is a whole bit there where the MD of the banking services saying you don't often get an opportunity like this in life

This ability to exploit opportunity or 'white spaces' (Hamel and Prahalad, 1994) was seen by another senior manager in the public sector as a differentiating factor in making Virgin agile, despite the diversified nature of the group:

For me personally the one that springs to mind is Virgin in the way that they seem to open up new businesses and expand and move into new markets. I tend to think of huge innovation in regard to flights and space, that is the ultimate of innovation and I see innovation as a big part of that. I tend to look at Richard Branson and the way he has survived and adapted and grown his business and that side of the business has many different assets of agility

When participants were presented with the question around what makes an organisation agile, there was a greater diversity of view, suggesting whilst it is easy for them to pinpoint an example of an agile firm, identifying the hallmarks needed for a firm to become agile is less clear. I now describe the most commonly occurring characteristics identified from the interviews in the order of their frequency, starting with mass-customisation.

Mass customisation

The most commonly featured response was the ability to customise or bespoke products and services, which tends to support the views of Goldman et al (1995). The authors clearly identify the need to be able to achieve this regardless of order size but this did not emerge from the interviews. The importance placed upon customisation was inconsistent with the survey, where the customer related element of agility was subordinate to structure, people and co-operation. Moreover, the weighting for mass customisation within the CAM was 4%, significantly below other aspects of customer agility. Emerging from an interview with a middle manager at WCC, the fast food retailing area was considered agile, largely as a consequence of the ability to customise the product for the end-user:

I thought about some of the services organisations like Subway and Domino's Pizza I felt provide, you go in and order a Subway, you can have different rolls you can have different fillings within it, they provide different offers on different days, so you bespoke your sandwich, likewise with pizza toppings, so they are the kind of things I thought about so I guess what I am saying in terms of what makes those companies agile is that they have a product but are able to bespoke it to a person's needs and are able to respond to the different demands of the people they are serving

One senior manager at MH highlighted how customisation allowed her to communicate more effectively with her customers:

When I first starting working there were photocopiers, fax machines and that was how you got a copy of everything, so now that I can actually send personal text messages or emails or letters to all of my customers, so my ability to communicate to my customers, my ability to get messages out to them is far superior that it was 20 or 30 years ago. So I would actually say that I could personalise things better now than I could then

The middle manager at WCC related the ability to customise to organisations that are ostensibly process driven such as manufacturers. She said firms which are over reliant on standardisation cannot be agile which appears paradoxical given the origins of agility in manufacturing:

It doesn't work in organisations that are very process and procedure driven……. I would suggest that some of the manufacturing industries particularly the ones that have gone down the lean route, I wouldn't say that they are agile because they are the ones that I was just talking about being very processed driven. I think sometimes when you are process driven you don't have the ability to work outside of those processes and I think that's what being an agile organisation requires you to do.

The respondent was able to bring the customisation issue to life by relating this to her work within the public sector. Even the less agile participating firms such as WCC suggested they were adept at bespoking. Whilst recognising that her organisation did not possess all the necessary hallmarks to be regarded as agile, she did highlight the bespoke nature of her work in responding to health and wellbeing issues:

I manage a social work and health team and I do think they are agile as we are having to respond to whatever comes through on that call whatever referral comes through, we are working with people, with families in crises and again it's that one size doesn't fit all so I know that the county council have gone down the lean route they are very keen on lean and I'm not always sure it works with that particular front line team

One senior manager from Midland Heart, who had embarked upon a project to make the organisation more agile, also highlighted the ability to tailor services to customers and used Tesco as a bell-weather, although this tends to dispel the notion that smaller firms are inherently more agile:

A simple example would be within care and support, we've got older people services as a discreet service, we've actually got more older people as customers within our housing business than we have in our care and support business, how much transference of our service offering have we got into those older people in our housing business, I'm not sure we've got many examples, so if you compare that to someone like Tesco, I'm sure that they are far more agile in terms of understanding their customers and understanding the opportunity and then taking it forward and exploiting it whereas we are really quite poor at that……Tesco was absolutely an organisation we talked about as being agile and I think part of that was that we perceive them as really understanding their customers so with the club card, that they have really good information on their customers and tailor their services accordingly

Innovation

Given that most respondents cited Apple or the technology arena generally as the epitome of agility, it is perhaps not surprising to find innovation featuring heavily in response patterns around the hallmarks which make an agile firm distinctive. This is not entirely consistent with the outputs from the survey, with innovation achieving a weighted score of 5% consistently across organisations on the CAM. Although there is commonality in responses across firms and sectors relating to innovation, this masks significant statistical differences in the perceived importance of innovation across management layers and length of service with the organisation. The view

from a middle manager within the public sector was around the juxtaposition of innovation and creativity:

> *I see that being agile is about being creative as well, it's about encouraging that creativity, that risk taking. I am not talking about mad risk taking I'm talking about educated risk taking, encouraging staff to bring their views, sometimes you can have staff that have got fantastic ideas but when you work in an organisation where top management never talk to those individuals on the ground, you stifle creativity.*

This view was reinforced by two separate board members from the private sector (finance and telecoms) around the importance innovation has on agile outcomes and reinforces the structural imperative within configuration theory around rigidity. The view from the financial sector professional was:

> *Agile organisations need to understand the market and challenges and extrapolate this information in a timely manner to respond to market dislocations. They are constantly thinking about what the market is likely to be doing in two years and constantly looking for new ideas*

And the telecoms chief executive suggested:

> *Innovation is about converting an idea to revenue and this is agility, which leads to competitive advantage. Companies able to bring products and services to market quickly will win but the key is sign-posts and is relevant to both manufacturing and service. There is a need for agility dependent upon the competitive structure of the industry, for example all bank products are similar meaning they need to compete on service to differentiate in a commoditised market. Apple is able to do this through design.*

One private sector senior manager blamed the inadequacies of reward schemes which tend to overlook innovation in favour of a shorter term impacts on financials:

> *Innovation is important unless the industry is slow moving, because with slow moving industries, companies just need to focus on serving customers properly. Reward schemes typically focus on the bottom line, not innovation*

but agility comes with innovation success, failed innovation leads to a reduced perception of agility

Another respondent (non-manager) from WCC used Dyson as an example of an agile organisation due to its innovation capability:

Dyson would be a good example as they make their product desirable by constantly innovating. This is a resource issue but the product becomes synonymous with a particular activity as in our household we refer to 'Dysoning' now instead of 'Hoovering'

One interviewee, a senior manager at MH highlighted Apple and Sky as being adept at creating a desire for new products and when asked how important innovation is in being regarded as agile, he made a distinction between manufacturing and service companies:

I suppose it depends on what kind of market place you are in, in a way you could argue whether to use an Apple and manufacturing …….. I think in that world [innovation] is absolutely critical. I think in the service world it is probably not so critical, but I do think the problem perhaps is completely overlooked and it's the pace, the pace is much faster in manufacturing than in the service

It is evident from the feedback that innovation in isolation would not bring about agility, and that this needs to be in unison with some other agile characteristic. For example, when asked about the influence of hierarchy, a middle manager within the public sector linked this to innovation and creativity:

I think if you've got an organisation that is very hierarchical, that doesn't allow for agility, as my perception of hierarchy is that sometimes it can stifle creativity, there can be issues around decision making, that's not to say that I feel we have to have all decisions made by committee but I do think that hierarchy can reduce the opportunity to be agile

This view is supported by McGrath (2013) who posits the importance of structure in determining innovation efforts and the alter-ego of this, senior staff seemingly

disconnected from front-line teams who experience frustration when messages that competitive advantage is fading are not taken seriously.

Control and Hierarchy

Although control and hierarchy is not deemed to have a high level of importance within the survey, this is a much more common theme emerging from the interviews. Within the survey, the overall importance weighting within the CAM is 4% but with two private sector firms, CDC and Halifax (both connected to the financial sector) placing a higher level of significance on this. The interviewees tend to see control and hierarchy as an arbiter for agile capability rather than an enabler, as evidenced by its citation in conjunction with some other characteristic. One senior manager at MH suggested size is not a determinant of agility, but it is the structure of the organisation, using HMV as the antithesis of agility:

> *I think it depends on the structure doesn't it ? If you think of commercial companies such as Virgin or Microsoft, you don't get much bigger than them, they are hugely agile. Often you look historically at local authority housing models and the way they operate and they can be the opposite of agile. Companies like HMV can go in circles and not move forward. I think it's about having structure in the right place*

When asked about what an organisation needs to master to be regarded as agile, a senior manager at MH suggested control and hierarchy was instrumental as this facilitates decision making and the ability to change:

> *I think they have to have an ability to change, I think there needs to be improved decision making within that organisation and perhaps delegated decision making, they've got to recognise the benefits of being an agile organisation because people will only embrace it if they can see the benefits of it to them, to their organisation and to their customers*

Another public service worker (WCC) related the issue of hierarchy to her own organisation by suggesting a lack of agility is directly attributable to this and the process driven nature of the organisation:

I can only speak for the directorate in which I work and we are really a small part of that. I certainly feel that within the teams that I manage, the team are agile because they have to be - because they are responding to our customers on a daily basis. However I do feel that some of our processes don't allow us to be agile. So for example, we can be responding to a change in needs completing a reassessment of somebody's needs, recognition that there needs to be a change in somebody's care package but in order for that to happen you have to go to funding panels and sometimes you have to wait for the panel, and sometimes decisions are deferred and sometimes you have to go back. Once that decision, is finally made, it can take time and I think sometimes those processes slow down our ability to be agile……..There are other parts of the council and this is only from an outsider looking in, that I do think they are extremely hierarchical and process driven and as a consequence of that I don't think they are particularly agile

A non-manager, also within the county council reinforced this view but additionally mentions the political agenda, which is often manifest in a non-collaborative way of working which is overtly 'top-down' in nature:

Government driven initiatives are not pragmatic leading to a downward strategy but with no mechanism for upward challenge. This target driven culture creates bureaucracy and within social service, which is risk-driven, decisions are made by people too far removed from the process and this impacts on culture

It is evident from the survey responses that the importance of hierarchy in bringing about agile outcomes differs across managerial strata. One senior manager within the public sector suggests a notional 'dotted line' exists between middle and senior managers with those below the line feeling change is imposed upon them rather than being part of shaping it. This opinion is partly mirrored by a board member within the telecoms sector who expressed a view that connectivity with the customer is what gives small organisations enhanced agile capability:

Small organisations have an in-built advantage on agility. Large firms need to go back to basics, a back-to-the-floor mentality, a finger on the pulse to

understand what customers want. The top down approach at large organisations impedes agility

A senior manager from the private sector considered the issue of hierarchy in relation to agility and when asked why there might be such disparity (from the survey) between how agility is viewed by lower level and non-managers, he responded:

The flatter the organisations structure, the closer to the top people feel. Steep hierarchies distance people from the strategy and make them feel disengaged. The shape of the hierarchy is very important to agility and helps to explain why small companies are more agile because workers feel closer to the top and therefore more likely to put ideas forward, which they are less inclined to do in a large organisation

A non-manager from a separate organisation (MH) also identifies a disconnect between how agility is viewed at the disparate ends of the hierarchy, and whilst she did make reference to top management needing to take a holistic view, she regarded a common failing of not being able to identify deficiencies in agile characteristics:

I think it's both at the higher level they can see that the business is more agile whereas I can't see that I just see where it's not, and how that effects our side of the business, they are seeing a lot more change from a holistic view and then the other thing is the other way around, because they see those changes they can't really see where it's not happening and the difficulties we have by not being agile

A board level (public sector) participant had a contrary view on the hierarchy issue, suggesting that a flat structure does not necessarily make the organisation more agile. Whilst it is true agility cannot be achieved by an efficient hierarchy alone, his view was at odds with other interviewees who tended to view steep hierarchy or bureaucracy as a major inhibitor to agile outcomes:

Our chief executive here very much prides ourselves on having a fairly flat structure so we are an organisation where the directors and chief executives don't have their car parking space with a silver plague with their name written on it, although we do have our own car parking spaces, but it is very much that open door, open plan office environment, and if you want to speak to

[him], he is very much contactable. So I don't think we are a particularly a hierarchical structured organisation. I've worked with some, that are more so than that, does that make us any better at being agile? No not particularly, I don't think it has. Would we be more agile if we more hierarchical? That's a really interesting question.

The other board level interviewee, from the private sector (IPScape) expressed the more conventional view that bureaucratic organisations tend to be slow but this is often necessary to control risk. He felt structure did not need to be a barrier to agility, but this was predicated on the culture being one that supports agility and that people are enabled:

If the CEO is connected to the entrepreneurial world, the organisation will display agile hallmarks with small definitely more nimble, but large ones are often bureaucratic and concerned with managing risk, which serves to slow them down and some large firms trying to appear agile can sometimes struggle to be taken seriously. Examples of agile companies such as software companies work on a scrum mentality which is chaotic but people take ownership. Structure or hierarchy does not necessarily create a barrier to agility if the culture is right and people are enabled. The 'catalyst for magic' used at ANP which is a conservative financial company (Australia) uses small innovation teams which allows it to behave like a smaller firm

Speed of Response

Whilst anecdotally speed of response would appear to confer agility, speed does emerge from the survey as an important issue for the agile organisation with all organisations affording this the highest importance rating of 6%. The issue of speed is also highly evident from the interviews although a senior manager in the public sector (MH) qualified this by saying rapidity is futile if it does not breed success. She also used the example of Virgin as being quick to react, but additionally a first-mover:

It's no good being fast and then being the first one to mess it up, but [Virgin] seem to be able to get in there very quickly, make it happen very quickly and be successful and I think the brand is very strong and that you have an expectation of what that experience is going to be like.

Speed is also acknowledged within the public sector as a vital ingredient for the agile organisation, and whilst there is a feeling that Worcester County Council is not agile, one middle manager highlighted that her team do display hallmarks and used speed of response to illustrate this:

> *I'll give you an example, a phone call comes into the social work team, Mrs Smith has had a fall and she cares for her daughter with a learning disability. We have to respond to that in a timely manner, it can't be a case of we'll twiddle our thumbs and think about it tomorrow and put it on the to do list, it has to be dealt with immediately and that's why I think we are agile because again you would make sure that you would get someone out there immediately, we've got an ability to then put in a care package into the home to make sure there is respite packages, it has to be speedy.*

This suggests agile teams can be masked by a monolithic organisation, as one middle management private sector worker illustrated, the speed of the organisation is measured not by the fastest element but by the slowest, mirroring the views of Jackson (1997):

> *Agility is a prerequisite to survival but in slow moving industries, or ones with long cycles, firms don't get any benefit from agility. Even where life cycles are longer, you can have agile marketing departments for example Coca Cola but the organisation will only be as agile as the slowest point*

Another WCC worker (non-manager) suggested speed of response is largely contingent on enabling employees, feeling that service could be transformed if customer facing staff were empowered to make key decisions, supporting the views of Mason-Jones et al (2000), Bruce et al (2004) and Greene et al (2008):

> *We have a poor response in terms of speed but speed of response would improve overnight if people at the customer interface could influence the offer*

Having considered the four most commonly cited characteristics of the agile organisation, I now introduce one emergent theme, which was not part of the original literature but it does appear to be a major arbiter of the firm's capability to be agile and was frequently referred to within the public sector interviews.

Emerging themes

A prominent issue to emerge, which is not evident within the body of literature, or previous studies to any great extent, was managing risk. From the interviews, only one other emerging theme was evident, from the interview with IPScape, which was a view that agility is linked to brand, to the extent that brand plays an integral role in the perception of agility. This was not an isolated view, but is completely at odds with the literature, with a senior manager at MH expressing the same opinion. This is because organisations with a strong brand identity are constantly aware of their positioning in the competitive environment which is inherently dynamic and therefore seek to continuously redefine the perception of the organisation in the light of these changes. The message here is strong to the extent that 'agility equals brand' but given the limitation of space within this study, I focus more attention on the issue of risk which was more commonly cited within the interviews.

Risk

Risk, or more precisely risk-aversion, was seen as a determinant for agility within the interviews and is a perceived barrier to agility within Midland Heart, where the regulated nature of the business and the need to manage risk is a restraining factor in meeting agility goals. Risk is not covered in any of the literature, other than a cursory mention in Gale (2012) but this is in relation to prioritising projects rather than a fundamental determination of risk. One senior manager at Midland Heart, when asked what organisations need to master to be regarded as agile, used Virgin as an example of a risk taker:

> *I think [Virgin] are innovative and I don't think they are risk averse and that's the key thing. They aren't afraid in some respects to fail, everything about their delivery and their approach to that delivery is designed to ensure success. I mean Virgin productions, for example, just doing the whole record business and a very successful business and if you look at the time when they went into the airline business, there were airlines like Pan-Am and all the ones that don't exist anymore, were actually going under, so he goes out and gets planes. Is he mad? Now the banking sector, never happy in the best of worlds, so what is he going to do, he's going to join the banking sector. To me that is an organisation that isn't afraid to take a risk and there is enough belief in its ability, belief in its brands, belief in its approach to create a market*

difference, but also to make it a success and rather than seeing other peoples failures as a reason to say we don't want to go anywhere near that, he actually learns from their failures and turns that round. I think that's why that particular company will continue to be ahead of the game.

Several of the organisations taking part (CHM, WCC and MH) all highlighted the issue of risk aversion or controlling risks as an inhibitor to being agile but the Halifax interview suggested regulated or risk-averse organisations can still realise agile ambitions but this could mean a fundamental recalibration or reassessment of the term 'risk'. Moreover it is felt large organisations often use 'risk' as an excuse and in fact this can be a misnomer as it is often a 'large revenue back-book' the firm is seeking to protect. A non-manager (MH) regarded agility as having connotations of risk but also made the acknowledgement that all businesses have to be prepared to carry some element of uncertainty and even taking no action can create unintentional risk:

I think they have to adapt to the market conditions, the economic conditions, the environmental conditions and for us it's the market forces, what our consumers need. They also need to be able to take advantage of the changes and get business to work better to those changes. I think they have to understand their business very well and the risks associated with being agile. There has to be an element of risk, if you remain static you can never move your business, I think your business can't survive. There's a risk in everything you do so even remaining static is a risk. I'm not sure you could ever operate a business without a risk.

The risk issue was also seen as an important issue within the other public sector organisation taking part in the study, with a team leader (middle manager) suggesting risk taking in her own organisation might not only make them more agile, but cost effective:

I think there has got to be an ability or element of being prepared to take risks in a managed way but risk taking nonetheless, the organisation has to be able to think outside of the box, have a willingness to change and challenge, be adaptable, and I think with all of those things you need an enthusiastic and motivated team around you…….. I think there are several issues. I think there is an element of risk aversion, it's a double edged sword really as a lot of our

processes are driven by the current economic climate that we find ourselves in, so there needs to be scrutiny of what we are spending our money on, so I think that's one of the reasons but bizarrely in terms of risk taking, I think that if the organisation was prepared to take more risks, safe risks I'm not talking ridiculous risks, I think we could reduce the cost of care packages

The view from the private sector was different in that for an agile firm, being risk-averse is not an anathema, with a middle manager saying:

An organisation can still be agile and manage risk, can still be risk averse but it must have the ability to experiment in a controlled or ring-fenced way. There still needs to be boundaries but the ability to experiment and this may mean redefining what constitutes risk

Risk-taking was also an eminent theme from the interview with CDC, with agile firms prepared to take measured risks whilst retaining long-standing principles or values. Implicit within this is a realisation that mistakes will occur with agility being concerned with responding to these. This is an opposing view to other interview outcomes where risk-taking seemed to be a barrier to agility but CDC offered this as a necessity for becoming agile. Whilst in agreement about redefining risk, another view from the private sector questioned just what constitutes risk since the public sector workers interviewed related this to regulation but a middle manager from Halifax related risk to the potential for lost revenue:

Risk management organisations can still be agile but this may involve a recalibration of risk. Large firms tend to want to protect large revenue streams. The opposite applies to small firms which tend to be more agile, but the challenge is often to keep revenue flowing. HSDL could be agile but they are not. They show hallmarks of agility but regulation holds it back but there is additionally a risk of losing large back-book income

Fetterman (2010) refers to the difference between key actors and respondents with key actors providing information in a more comprehensive way, contrasting with respondents who display more reticence in their engagement and generally less fulsome information. Given the significant ambiguity about what agility is, one of the fundamental aims of the study being to build an understanding of what agility means for organisations, this appears highly relevant. This does appear to hold congruence

with the notion that agility is strategic in nature and therefore the responses from more senior levels of the hierarchy reflect that level of engagement which is much less evident with the non-manager interviews.

In this respect I was cognisant of the effect my presence might be having on the flow of information, since with interpretivism the researcher cannot be truly unobtrusive, but to mitigate this, in addition to reinforcing the message that there were no right or wrong answers, I emphasised that I was most interested in hearing what the phenomena meant *to them* in the light of their own experiences. Status within the organisation does appear to have a material impact on the strength of view in relation to agility with lower level workers generally struggling to identify with the term and even board level employees displaying disparate views. This perhaps illuminates a perception issue within organisations that agility is synonymous with seniority and whilst more junior interviewees were able to pinpoint examples of agile firms, they were far more tacit on some of the capabilities which made this a possibility.

The final part of the qualitative data presentation is extracts from an interview with the Head of Change and Transformation (HCT) at Midland Heart (MH). MH has a strategic aim to become more agile so I was keen to understand what they thought this might mean to them and why this had lost momentum.

Agility Progress at Midland Heart - Interview outcomes

Given the self-imposed aim of becoming more agile, I was keen to understand just what people in the organisation felt would be needed and what they felt might be different from life before agility. The impetus and momentum on the journey towards making MH more agile had waned significantly and was eventually subordinated in favour of other initiatives so I was also interested in why this had faltered. To gain an insight I conducted an interview with the Head of Change and Transformation (HCT) who had the responsibility for delivering the agile agenda. The outcomes from the interview, which was recorded and transcribled, are supported by commentary from other MH employees that were interviewed as part of the wider study.

The Midland Heart agility plan was inspired by the Finance Director (FD who subsequently became CEO), as a means of better realising the corporate strategy since it was felt achieving the ambitious corporate goals could only be supported by the organisation becoming more agile. MH had been party to a merger in 2008 and in

the wake of this, performance had faltered but subsequently recovered, meaning agility was the vanguard of a new era for the organisation. One senior manager felt the organisation, whilst having ambitions to become more agile, may have misunderstood what agility involves and thus the agile strategy is potentially built around the wrong motives. At MH agility was seen as a passport to growth, scale economies and efficiencies. When asked about the original motivation behind the desire for the organisation to become more agile, the HCT responded:

> *We needed to be more agile as one of our corporate priorities. Where I think its origins might lie is in the work I did for a business transformation role a few years back without having any academic awareness of the definition of agility in this context, I made a comment on one or two papers I did around corporate strategy that in the future we would need to be more agile, probably just in response to the fact that I didn't think as an organisation we were very responsive compared to other places that I'd experienced, everything we try do seems to take a long time through committee structures etc.*

When asked what MH felt they might be doing differently, the HCT suggested there might be a different structure, systems, technology, processes and more internal collaboration. The HCT admitted to having no awareness of the academic underpinnings of agility but 'had made throw-away comments' about MH not being as agile as previous organisations he had worked for, with a key element of this 'being more responsive' but the FD regarded agility as more general such as finding 'new and better ways of working'.

> *I think the view was that if you want to pursue that growth strategy we've got to find new and better way of doing things ….. if we are going to do x, y, and z most of the time that's what we deliver for customers, nothing spectacular but we do what we say we are going to do, and I think for the next phase of the journey that says well now we want to grow and want to be the best national provider, we need to find new and better ways of working if we want to achieve that. I think that's the overall context for it. Certainly in terms of the academic definition that I'm aware of I had no awareness of that beforehand so I think and I imagine this is probably the case for all of my colleagues, but I think the common thread in our understanding was that there would be something in there about new and better ways of working and that was the common understanding.*

He felt collaboration was particularly important and the group creates waste by not working collaboratively and sharing knowledge and skills, suggesting 'someone like Tesco would be better at unlocking this collaboration'. When asked if there were any perceived barriers to achieving their agile goals, HCT was quite clear that this may lie at senior levels within the organisation:

> *We talked about the barriers to taking this forward, we looked out towards the rest of the organisation and thought 'how can we get them to buy in' and that's how the idea of engaging all the middle managers evolved, which we saw as a key group, but it's interesting that we looked out at middle managers but in reality it's the executive team that are perhaps one of the biggest obstacles in taking this forward. I'm intrigued as to whether members of the executive team know that or they were blind to it.*

In addition, it was felt the organisation needs to be in a state of impending crisis for change programmes to be effective and this perceived lack of importance around agility was also felt to create a potential obstacle:

> *It's almost about what crisis do we need to create……I don't think people feel that if we don't think radical then we won't survive, it's almost, if you want to go from where we are now which is fairly comfortable, it's almost like a created ambition, a created need to do something radically different rather than a sense we've got to do this to at least survive and again in my own experience from working in other sectors is that it's just a bit comfortable here, relatively speaking.*

On the question of whether there had been sufficient 'buy-in' from staff, the interviewee (HCT) admitted 'it did not feel as though people were buzzing about agility', but one explanation for this might be that agility had not moved beyond the senior management level or steering group, which itself had no non-managerial representation, meaning lower levels of hierarchy had not been truly engaged:

> *I don't think that its really moved much beyond a small executive and senior manager group, who are really close to this sort of work on agility so I wouldn't say at this point in time that it's a lack of buy in amongst employees generally because I don't think we've taken it close enough to employees and*

given enough opportunity about it. We've talked about the opportunity for lots of projects but then not followed that up with those projects, there's been nothing really tangible for people to get involved in…….the leadership team should however have communicated a clear co-ordinated programme to show what and how but this did not happen and the organisation is similarly devoid of a desired end-state or measures.

This is an issue identified from the interview with a board member at MH around communication and might help to explain the difference in perception of agility between senior and more junior levels identified within the survey. The HCT felt this was a leadership issue as one of the identified obstacles was the possibility of ineffective employee buy-in but in reality it was the Executive team which proved to be a 'blocker'. The interviewee was unclear whether this was a collective failing or of key individuals making up the executive team. A non-manager suggested MH is not agile but this belies an internal belief that they are, though having experienced several mergers in the past decade, some latent agile capability must exist and the fact that MH was overtly including agility as part of the corporate strategy was well received. Moreover the interviewee could already see hallmarks of a more agile organisation emerging, for example through the move to help first time buyers with MH backed mortgages, though this view lacked consistency with those expressed by other MH interviews.

A senior manager within MH felt the organisation was not sufficiently entrepreneurial, supporting the view of a board member that the environment was 'comfortable' but this was seen to have strong connectivity to agility. Within MH the interviewee felt there was a varying need for agility but the interaction between Directorates had been plagued by lack of co-ordination and alignment, leading to duplicated effort and inefficiencies. This tends to support the views of Kay (1993) on the importance of architecture but additionally highlights the caution advanced by Grant (1991) around sub-optimisation. This was felt to be primarily a leadership issue in terms of setting a clear vision, but it also intuitively felt like a cultural phenomenon. The HCT summed up the lack of vision:

If there is true commitment at the top of the organisation there's a real failure to convey that, I have to say. Given my role as a senior manager, accountable into the executive directors to make it happen, I've got significant

doubts as to whether the commitment is there so on that basis how could I expect anybody else in the organisation to feel that sense of commitment.

It was felt that if the FD had not raised the issue of agility per se, 'people would not have thought about [it]', added to which HCT made reference to questions being raised about benefits and payback. This was also very evident to me within the interviews as when asked about what outcomes they expected from being agile, the main response was around more rapid decision making.

When asked about how the reality of agility compared to the perception, the HCT felt the first stage was expected to be a short term opportunity to get an internal perspective and this meant gaining an insight into the academic case for agility along with what would be required from the organisation, and how this might be achieved. It was felt the completion of this stage in March 2012 had achieved this objective. The second stage was expected to consist of a number of initiatives or projects to implement the findings from stage one but after the initial flurry of activity, the initiative had been cascaded to the directorates and consequently momentum dissipated:

Our original expectation, certainly mine, following conversations I had with [the FD] and other board members, we expected there to be a number of projects or initiatives that would come out of this first phase and we'd get a lot of engagement particularly from our middle manager community, of around 150 people, and that we would spend 2 to 3 years running that programme. As it stands at the moment and from my point of view, disappointingly, I don't see anything to suggest that its likely to happen. It appears as if after quite a strong initial push we've got to the point where if there is going to be a programme there is not a lot of talk about it at the moment. And it appears as if it has dissipated out to individual directorates that they will do their own blue prints and include within that whatever it is they think they need to be more agile

In evaluating the overall journey toward agility it was felt the first three to four months (stage 1) had been useful for gaining a fuller understanding of agility but the progress since completion of stage one in March 2012 has stalled without sufficient emphasis to maintain momentum.

I think what we've done in the first 3 or 4 months has been really useful as an eye opener and getting a better understanding of what we actually mean by agility and understanding how to segment our operations and see where we need to be agile and where it's perhaps less important. That's gone really, really well, but how we've progressed on the journey I can't find a better way to describe it other than its stalled. It feels to me that we've got some good awareness but as it stands right now I really do not feel confident that we've got enough emphasis on this area that we are really going to drive it forward. To the extent that I've spoken to [CEO] and tried to get a sense from her, as to if it's still high on her agenda, is it still really important and I've got a response that says yes it is, but I'm not seeing anything else

Historically MH has found change programmes difficult due to general resistance and this could be explained by the relatively 'protected' nature of the sector in which they operate, corroborating the views from other MH interviewees, including a senior manager:

Other factors that could be in play, change is difficult in any environment, in any organisation but my view of Midland Heart is that significant change has always proved difficult and I think you get the typical situation that people who have prospered under the old ways are reluctant to change

Aligned to this, the elevation of the FD to CEO has brought with it a wider and more demanding portfolio meaning the central impetus has been diminished and the HCT admitted to being uncertain if this was simply a 'pause to re-energise' or a more cynical view that agility was used by the FD as an exciting way of moving the organisation forward which could be leveraged for career progression:

First of all is there really a blockage or just that I perceive there to be a blockage so it could be because we've had significant events, with [the FD] now becoming the Chief Executive Officer and having a much bigger and different portfolio, is it that there's just a pause while she takes on her new portfolio and then we'll re-energise the agility work or is it that actually, there could be an element of it was a useful piece of work to be blunt to help to her secure the Chief Exec role

The rhetoric from the new CEO is that MH remains committed to achieving its agile aims but this is inconsistent with the actions according to the HCT. It was felt that if the individual directorates are tasked with delivery 'some will do it, some won't' so this very much needs a leadership focus to maintain the impetus. If the decision is made to 'park' agility, the HCT felt the concept 'could disappear quietly' because the organisation had not done sufficient to embed this to 'make people question where it went or why it wasn't pursued'.

> *In terms of the majority of staff, it could well be that it just falls off the radar, doesn't get mentioned in monthly management briefings to all staff and it could probably just disappear fairly quietly. I've seen that happen on a number of initiatives; suddenly we've just stopped communicating about it and it just goes away so that could happen, I don't think we've done enough work with staff on the whole for it to be significant in their minds and wouldn't really miss it if we don't talk about it anymore, there might be the odd loan voice that says 'whatever happened to the agility thing' but it could probably disappear quite easily.*

When asked whether he felt MH was truly committed to achieving agility, the response was negative, due to a perceived lack of conviction such that 'if there was true commitment at the top of the organisation, they have not communicated it'. I asked if the issue of complexity had been material in the reduced momentum but the HCT said '[I] cannot recall any conversations about whether complexity is a barrier and in fact, if complexity had been an issue, we may have seen a more comprehensive response'. This leaves MH at a cross-road with two extreme outcomes – 'either agility will slowly peter-out or it needs a kick-start, but this will need to be CEO led'.

Finally, when asked whether the aspiration towards making the organisation more agile had turned out as expected and where MH goes from here, the interviewee suggested:

> *As it stands at the moment, no, I expected that by now we would have, having done the initial focus with external support, which has gone very well, enough material to say well ok, the original intent of that first phase was we will develop a programme to say this is what we need to do in our organisation to be agile and will have a 2/3 year programme of various initiative/projects that*

lots of staff will get involved in delivering. We haven't got that. And I sadly can't see any immediate prospect that that's going to materialise. So no it hasn't turned out as I expected. The first phase of assessment has turned out better than I expected but a resulting programme of activity to make us more agile quite the opposite and I think we have stalled and I don't think we have got anything to actually show for it……

We used the phrase earlier that we are at a cross roads and I think we are absolutely at a cross roads. For me this will either just peter out or if we genuinely want to make it happen and genuinely want to become more agile it needs a real kick start so I guess there are two broad scenarios, it withers on the vine and disappears and goes away quietly or if we do genuinely want to make it happen then probably the Chief Exec needs to reinvigorate things and kick start it. Perhaps when she has got her breath back having taken on a new portfolio she might say right ok we are really kick starting this again but at the moment I can't see any signs of that.

Standing back to reflect on the issue, agility at MH appears to have been the 'inspiration' of one key individual and whilst it is perfectly plausible that making a change-resistant organisation more responsive might improve the chances of fulfilling corporate goals, it appears incongruous that an organisational aspiration should be formalised without some clarity over what it might mean for the group, teams and individuals within it. It is also significant that the agile agenda remained within the confines of the senior management fraternity and whilst agility appears strategically led, operationalization was doomed to failure without the engagement of lower levels of the hierarchy. It would be easy to accept that elevation to CEO might justifiably widen the sphere of responsibility and thus lead to dilution but the CEO is ultimately responsible for delivering the corporate strategy. Agility was identified as an enabler to facilitate this but there remains a question over whether an organisation which has struggled to affect change, operating in a stable environment, really has an appetite for comprehensive and complex change programmes. The risk here is that allowing the agile agenda to slowly evaporate, means a waste of resource (for stage 1 work) for MH, with no tangible benefit and leads to cynicism amongst workers about a) whether MH has conviction for change and b) change resistance is in some ways expected and ultimately rewarded through inertia.

Chapter Five

Analysis and Discussion

Introduction

Seymour and McCabe (2007) highlight the difficulty of establishing 'truth' particularly when there are divergent views between practitioners and academic circles. Agility is a contested theme so the fundamental basis of this study is to use abduction as a means of arriving at the most plausible explanation. My starting point of attempting to quantify agility did give way to a realisation that it is a complex web of characteristics and it is the blending of these which defines whether an organisation is agile. Since abduction is inferential it allowed me to ask participants to express views and opinions around what they thought made a firm agile. The problem lies in that whilst there is acceptance of its complex composition, practitioners found identification of hallmarks difficult. Abduction helps me reconcile this by allowing me to make sense of the data and so advance a more credible explanation and this is articulated in this chapter.

Goldman et al (1995) identify the existence of four 'pillars' to agility and whilst they acknowledge that the means for an organisation becoming more agile rests on a number of individual traits which are more granular in detail, these are not homogenous across organisations, a view later reinforced by Sarker et al (2009). To test this, participants in the survey were presented with a number of 'behavioural' statements framed around agility characteristics identified from the literature. These were positioned as aspirational qualities which it was felt might be important for an organisation to be regarded as agile and respondents were asked to score these from 1 (not important) to 10 (very important).

The outcome from this part of the survey reinforces the view that agility is constructed around four collective pillars as identified by Goldman et al – Customer, Structure, Co-operation and People. Whilst the relative importance of these differs across organisations, this variance is limited to a tight range. At a more detailed level, a similar pattern emerges which holds congruence across the fundamental 'building blocks' of agility with the relative importance of agility characteristics differing, but within a modest range. This leads to a conclusion that there is evidence of commonality within the

characteristics of the agile organisation but it is the relative importance of these which differs across firms and industries. This theme is developed in the next section where I discuss in more detail the hallmarks and how these were perceived in importance

The existence of factors which determine organisational agility

In the following pages, I set out the key findings from the research, drawing on both survey responses and outcomes from the interviews, making comparisons to the extant literature. For consistency and to assist the reader, the analysis is structured along the four pillars, a theme running through this thesis. It should be remembered the quantitative data in relation to agility scores is that which emanated from the survey responses from each organisation but given the limited sample size, and in most cases just one organisation per sector, the ability to generalise is limited.

Customer

The least important of the four collective agility traits identified by Goldman et al (*ibid*), amongst the survey participants is 'customer', which could be accounted for by perspective in the sense that the organisations could be too internally focussed, an issue highlighted by Kotter (2012) and the result could have been materially different if the survey had been extended to their respective customer bases. It is also a slightly curious outcome given the fundamental driving force behind the concept of agility identified by Goldman et al – the end of the mass production being superseded by an era of 'mass customisation'. The average importance weighting for the customer element of agility is 20.41%, marginally below that for co-operation, but in common with co-operation, the average achievement score exceeds the importance factor (21.47%) suggesting firms tend to perform well in this area. There is evidence of a divide along this dimension with the three less 'commercial' organisations (CHM, MH and WCC) attaching greater importance to this area and all three having an achievement score exceeding the respective importance weighting. In the more dynamic sectors (Halifax, IPScape and CDC) all assess their performance above the importance score but the importance weighting for each, is noticeably lower. This is not consistent with the outcomes from the interviews which elevate the customer side of agility through the significance attached to mass customisation and innovation.

Customer			
Sector	***Name***	**Importance (%)**	**Achievement (%)**
Public/ Quasi-public	CHM	21.30	21.45
	MH	21.06	22.05
	WCC	20.85	21.57
Private	Halifax	19.80	21.18
	IPScape	19.49	21.06
	CDC	19.46	20.19

Table 47 Matrix demonstrating importance and achievement scores for participating organisations in relation to customer elements of agility

The differing perceptions of 'customer' agility at various levels of management might help to explain the view that agile capability carries significance at the customer interface which supports the views of Mason-Jones et al (2000), Bruce et al (2004) and Greene et al (2008) and reinforces the findings of CIPD around the importance of employees as an early warning system in relation to customer behaviour.

Solutions

The ability to offer customers 'solutions' as opposed to simply products or services is seen as an important factor for the agile organisation according to Goldman et al (1995) but this is not identified as important by interviewees at any level, appearing to overlook the importance placed on provision of solutions by Ettenson et al (2013). The survey does however reveal a statistically significant difference between the private and public sectors with the importance level higher within the public sector (median 9 vs 8 for private sector). The importance of this difference does not emerge from the literature, but is highly evident from the interviews with WCC and MH. Within the private sector it is only CDC which appears to attach importance to this and this is undoubtedly influenced by the bespoke nature of its offer. Solutions is additionally seen from the survey as having a linkage to other aspects of customer related agility traits with a strong correlation to the ability to customise (rho = 0.512) and a medium strength relationship (rho = 0.399) with innovation, though neither of these show any statistical significance across sectors. However in absolute terms the correlation with innovation is stronger in the private sector (solutions/ innovation rho = 0.616 private, rho = 0.242 public) and with customisation stronger in the public sector (solutions/ customisation rho = 0.458 private, rho = 0.555 public). This is substantiated by the interviews as all citations of innovation are drawn from the private sector but some of the best examples (WCC) of customisation emerge from interviews with public sector workers.

Sambamurthy et al (2003) and Rigby et al (2000) also identify the importance of customer centricity for the agile organisation. This divides opinion within the survey, with CDC surprisingly subordinating the importance of this but CHM and WCC attaching the highest importance weighting to this element. The interview with CDC (board member) tends to contradict the survey outcome by revealing a view that the customer element of agility is the most important, with a suggestion that the customer should be at the heart of the agile organisation. Whilst this is fully consistent with the views of Goldman et al, the customer importance score for CDC is the lowest of all participating organisations at 19.46. This issue is reinforced through the interview with a WCC senior manager providing an example of how individual teams seek to provide a complete package of solutions to users:

> *Within health and social care we do need to be agile particularly because we are dealing with demands of people. Our packages of care are not one size fits all, treatment plans are not one size fits all, so for example if Mrs Smith is having a hip replacement whilst the actual procedure in theory should be done in the same way because of body sizes, body types, people's ability to recover from surgery etc, I think the services in which we work have to be able to respond to those situations.*

It is evident WCC has ample scope for improving agility (overall agility score on the CAM is the lowest at 9.65) but WCC finds mobilising this problematical with this 'inertia' manifest in the culture of agility being ranked lowest amongst participants at 0.47. The sluggishness of the current response time however belies a compulsion to serve customers well with the CAM revealing the third highest score on 'solutions' in the study at 0.72. This appears to reflect the views of Branson (*ibid*) that values are more significant determinants of agile behaviour than structure. Herein lies a dichotomy since the ambition to provide complete solutions to service users is constrained by a corresponding weakness in 'mass customisation' which is low, and comparable only with that of Halifax which is a highly commoditised business.

There is evidence of a division in weighted scores based around organisational size, with the three largest firms registering superior outcomes for solutions despite only WCC attaching the highest importance weighting to this dimension at 6%. This could naturally be a resource issue since large financially robust firms have an inherent advantage in being able to provide solutions through economies of scope.

Solutions not products			
Firm size	***Name***	**Importance (%)**	**Weighted Score**
Small	CDC	4	0.53
	IPScape	4	0.65
	CHM	6	0.70
Large	WCC	6	0.72
	Halifax	5	0.74
	MH	5	0.80

Table 48 Matrix demonstrating importance and weighted scores for participating organisations in relation to solutions

Among smaller firms too, the stand-out feature is the importance weighting placed upon this dimension by CHM and this does appear consistent with the practice whereby CHM uses patients (customers) to help shape the service, echoing the view of Damanpour (1996) around the need for service based organisations to integrate customers into development of their proposition. In order to facilitate this, CHM deploy a patient participation group (PPG), a cross-section of patients to highlight issues managers need to consider in shaping the service and this would appear consistent with Damanpour (*ibid*)

Innovation

Innovation and design is given equal importance (5%) by all six organisations in the survey and whilst this appears unremarkable, none attach the highest importance weighting of 6% meaning, at first glance, all organisations perceive innovation and design to be less important than speed of response, exploiting information and reading the external environment. The findings however, are not reflective of the interviews where participants from all firms are able to isolate innovation as one of the key enablers for the agile organisation, making it the second most commonly occurring issue. Indeed, most examples of agile organisations are inextricably linked to a propensity for innovation or design such as Apple or Dyson. Trying to reconcile why innovation and design assumes such low importance could be explained by Tether (2005) who makes a distinction between manufacturing and service based industries and suggests perceptions in relation to innovation tend to be grounded upon the manufacturing industry, with the difference exaggerated since service outputs lack tangibility meaning innovations can lack visibility and thus be difficult to quantify.

Tether (*ibid*) also suggests the distinction between innovation in services and manufacturing could be due to factors influencing innovation within the service sector

being widely accessible, leading to convergence. Whilst this stance is not tested explicitly within the study, there is no evidence of a difference in the importance of innovation across the private or public sectors, though issues such as culture and hierarchy do serve to influence innovation efforts. Several interviewees highlight excessive hierarchicy or control stifling innovation, a key theme for the public sector based on the interviews (WCC and MH), but this is perceived as necessary in terms of controlling risk and appears consistent with the structural imperative engrained within configuration theory. Correlation analysis however shows virtually no relationship between innovation and hierarchy (rho = 0.09) which does not support the outcomes from the interviews. A corollary to this however is the views of Damanpour (1996) and Palmberg (2009) that tight control impedes creativity, with Greasley et al (2007) and Handy (1976) suggesting enabled and empowered employees will be more creative and this tends to be supported by the survey with a medium strength correlation (rho = 0.341) between innovation and enabling workers.

Whilst innovation is seen by MH as a primary requirement for the agile organisation, this has to be viewed in the context of the pace of industry change, with slow moving change negating the need for innovation and here firms need to focus on customer treatment strategies and executing these expertly. Kay (1993) argues that innovation in isolation is seldom sustainable but the interviews dispute this, with board levels employees (both private sector) expressly highlighting the salience of innovation in bringing about agile outcomes, supporting the views of Cepeda-Carrion (2012) who regard innovation as a determinant of sustainability.

There does appear to be a divide between weighted scores for innovation based around sector orientation with the overtly private sector firms (CDC, IPScape and Halifax) generally assessing themselves as more innovative than the public (WCC) or quasi-public sector firms (CHM), but this could equally be explained by the rate of change in the respective environments occupied by the organisations taking part. Interestingly it is technology related or financial firms that are offered as examples of innovative industries by one board level interviewee. Since the healthcare industry tends to experience more gradual change which is sign-posted in advance, innovation tends to be incremental thus supporting the views of Von Hippel et al (1999) and is substantiated by the assertion from the survey that CHM favours improvements to existing services rather than design of anything radically new, consistent with the views of Tether (2005).

Innovation and Design			
Sector	***Name***	**Importance (%)**	**Weighted Score**
Public/ Quasi-Public	WCC	5	0.39
	MH	5	0.50
	CHM	5	0.54
Private	CDC	5	0.56
	IPScape	5	0.58
	Halifax	5	0.60

Table 49 Matrix demonstrating importance and weighted scores for participating organisations in relation to innovation

There is also evidence of differing views on the importance of innovation across managerial layers with a statistically significant difference between senior and non-managers, with the former regarding innovation as important. This appears representative of the differing views between managers and non-managers in relation to agility in general and can be explained by the strong *association* between agility and innovation amongst interviewees. This is mirrored across time spent with the organisation which tends to alter peoples' views on the importance of innovation, with those longest serving tending to see innovation as important and those serving between six and ten years less so. Hargadon and Sutton (2000) feel innovation efforts are problematic within large firms due to a lack of visibility of other parts of the group but this is not evident from the interviews with almost all examples of innovative firms being confined to large 'blue-chips'.

The weighted scores for innovation and design are tightly clustered across 5 of the organisations, ranging from 0.50 for MH to 0.60 for Halifax. The exception to this is WCC who generates a self-assessment score significantly lower than the rest of the group at 0.39 and this could be symptomatic of a bureaucratic organisation where decisions are made at senior levels and cascaded without consultation, a view emerging from the interviews. Thius is consistent with the views of Kay (1993) who highlights organisations exhibiting high degrees of innovation have an architecture which facilitates a continuum of innovation. Damanpour (1996) suggests an association of innovation with structural complexity and that of organisational size (Bennis and O'Toole 1993), but views complexity as a positive influence since complex organisations contain a diversity of skills to generate new ideas but qualifies this to the extent that under conditions of stability, the importance of innovation is diminished.

The issue of managing risk, balanced with the drive to be innovative proves to be a common theme within the interviews but is not widely covered within the literature. It is evident overtly prudent management stifles creativity, meaning innovation (and therefore agility) and risk tolerance, represent polarities and it is incumbent on management to establish a position which allows reconciliation of risk boundaries and an innovation culture. As one senior manager within the private sector suggests, this may mean a fundamental re-assessment of the definition of risk. It does not appear to be agility in itself which carries risk, according to McCann et al (2009) but the exposure to rapidly changing environments so it could be argued the greater issue for risk-averse firms is not being agile when the environment is changing rapidly.

First Mover

For the purposes of the Corporate Agility Matrix, 'first mover' initially felt like part of innovation and design in keeping with the 'concept to cash' principle posited by Goldman et al (1995). First mover most certainly does have hallmarks of being able to bring products or services to market rapidly and overtly before competitors but the survey responses tend to display a greater level of importance to first-mover than the broader issue of innovation. In the original design phase, I included a separate measure or weighting on the CAM in respect of First Mover but after reviewing the literature base, this was amalgamated within the innovation and design element. With hindsight, it is felt first mover does warrant a separate measure within the CAM as the interviews led me to reflect that, whilst respondents talked loosely about innovation, the emphasis was more about getting to market first. Moreover, given that service firms may not associate innovation with developments lacking tangibility, a modest alteration to a service offering may not necessarily perceived as innovation but could still be sensitive in terms of 'time to market'.

First-mover is regarded as highly relevant to the agile organisation according to the interviews, though none used the exact phraseology. Several participants cite Virgin's ability to identify opportunities and respond rapidly, so the question is whether first-mover is a characteristic or if it is conflated with 'speed of response'. First mover may simply be a manifestation of reaction time which is demanded by fast-paced markets since it appears to be Virgin's reaction speed which creates the impression of being agile whereas Apple is selected for its ability to 'shape' consumer behaviour. This would appear consistent with the views of Sambamurthy (2003) around the ability of agile firms to experiment, detect opportunities and respond.

Assimilating Information

The element of customer agility rated as most important from the survey is 'assimilating information' which attracts the highest importance weighting (6%) from five of the six firms, the exception being Halifax where this is seen as slightly less critical (5%). There appears to be no consistent pattern or commonality in relation to the importance or ability to assimilate information with firm size and sector background not appearing to be influential in defining the outcome. This creates something of a paradox since Glenn (2009) highlights the difficulty encountered by executives of accessing information to make informed decisions. Assimilating information is not evident within the interviews, though reference is repeatedly made about the ability to exploit information or more specifically the downside of dysfunction in this area.

Similar response patterns for middle and non-managers are a recurring theme throughout the quantitative element of the study. Kotter (2012) expresses a view that organisations should be able to elicit information about the operating environment from workers closest to the customer but the interviews with public sector employees identify dysfunction where controls are so onerous that information becomes obsolete before it is passed around the organisation, an issue consistent with the views of Dove (2001) and is especially relevant in turbulent markets where obsolescence is more rapid. It is also suggested that decision makers (senior levels) within the public sector are simply too far detached from the front-line and thus make strategy calls based upon inaccurate or out of date information. Rigg (2011) suggests this can be overcome in the public sector by bringing senior professionals from varied disciplines together in pursuit of improved integration of services and this shared discovery will improve multi-agency working. This does appear futile if the senior professionals involved fail to impart this learning lower down the public sector, a cautionary tale from MH. The survey identifies a marginal negative correlation between assimilating information and hierarchy and control (rho = -0.025) which supports the outcomes from the interviews, though the weak correlation means this is not conclusive.

Customisation

The shift to an era of mass customisation is viewed by Goldman et al (1995) as a seminal moment in defining the need for agility, with Vazquez-Bustelo et al (2007) supporting the need for simultaneous delivery of efficiency with customisation, but

mastery of this is seen as less significant in delivering agile outcomes within the survey, with four organisations (CHM, WCC, Halifax and IPScape) attaching the lowest importance weighting (4%) and two (CDC and MH) affording this a 5% weight. This apathy contradicts the outcome for the interviews where customisation is the most commonly occurring agile characteristic although reference is not made to scalability, meaning participants explicitly view customisation rather than mass customisation as key. An example cited is Apple based upon their ability to provide a product that allows users to customise. Although when tested using Kruskal-Wallis there is no statistically significant difference between scores across management layers, this is relevant when considered in relation to time served with the organisation. Those serving six to ten years attach the highest importance to customisation and those between three and five years the lowest, although follow-on Mann-Whitney tests using Bonferroni adjustment suggested the significance was marginal at the (adjusted) 0.01 level.

The fast-food sector is used as a specific example of customisation and whilst Dominos appears to embody agile characteristics in the form of customisation, this is predicated on the proximity of production to customer. This becomes more problematical where the value chain is more protracted or complex with interviewees suggesting process driven firms would find customisation difficult and this seems to reinforce the link between customisation and causal ambiguity. This is perhaps more relevant at team level than an organisational perspective since the interviews elicit examples of teams which operate within highly controlled structures (such as WCC) but which have the capability to provide customisation, seeming to contradict the view that rigid firms are the antithesis of customisation.

In the case of CDC, the self-assessment leads to a weighted score of 0.70, considerably higher than the rest of the assessment group but this could be idiosyncratic to the organisation since CDC provides bespoke financial solutions to wealthy individuals meaning customisation is integral to the offer. Customisation is not evident from the survey responses from WCC which generates an importance weighting of 4%, (the lowest), and an achievement score of 0.38 which is also the lowest amongst any of the participants. This element is where the senior manager I interviewed feels there was a break-point between agility and flexibility, with agility seen as the ability to adapt and change in response to individual customer need, compared to flexibility regarded as the ‘ability to move but within what you have’, suggesting a more constrained position, fully reflecting the views of Dove (1995) and Hormozi (2001).

Having considered the ‘customer’ which is surprisingly the least important agile pillar emerging from the survey, I now consider ‘structure’ which is afforded the highest importance, tending to support agility’s theoretical underpinnings being configuration theory.

Structure

When considering agility in relation to the four major components identified by Goldman et al (1995), structure assumes the highest importance in the survey across all participating organisations, with a weighting of 31.29% but the average achievement score amounted to 27.67%, suggesting organisations tend to underperform in relation to this element. It is noticeable that the three largest organisations (Midland Heart, Halifax Share Dealing and Worcestershire County Council) tend to exhibit the greatest underperformance in relation to structure, appearing to support the views of Bennis and O’Toole (1993) and the importance placed on structure by Goldman et al.

Halifax and MH share many of the hallmarks displayed by WCC in relation to structure, though the closest correlation occurs between WCC and Halifax which is surprising since one is a public sector body and the other a private sector enterprise, though owned by a large parent group (Lloyds Bank). Halifax places a greater importance on structure than WCC with a weighting of 32.43% and an achievement score only marginally superior to WCC at 26.67% and this is supported by the interview with a senior manager at Halifax who suggests the hierarchical structure imposes restrictions on its agile capability.

MH shows a lower importance score for structure at 30.55% with a higher achievement score of 27.53%. Of the three largest organisations they appear more adept at scanning with a total scanning score of 65.94 but are much weaker at responding with a score of 59.78, representing the largest gap between scanning and responding of any of the participating organisations with only the responding score of WCC lower. This is evident from the interviews with MH staff which highlight the difficulties of implementing change programmes. When asked if Midland Heart could be regarded as agile the response from a senior manager was negative, suggesting the organisation is slow, risk averse and not innovative with the main reason for this cited as structure and processes.

There are inconsistencies between the survey response and the interviews where repeated reference is made to organisation structure being a potential inhibitor to agility. Explicitly configuration is used to illustrate the efficacy of decision making and the impact this has on response times, with the public sector particularly vociferous in relation to time taken to effect key decisions. This tends to create a tension where independent front-facing teams attempt to be responsive to the needs of end-users with key decisions which need higher level sanction, being dilatory. Miller (1996) highlights organisational structure as a manifestation of the level of change in the operating environment meaning the hierarchic nature of the public sector could be justified, given the historically pedestrian levels of change.

Configuration

One key question I had was whether small or large firms are generally more agile with Bennis and O'Toole (1993) suggesting small organisations may be inherently more agile. Whilst this was generally supported by the interviews, it does not preclude their larger counterparts from being agile, with most examples of agile firms emanating from the interviews being large (Apple, Tesco). This would suggest that firm size, whilst a determinant for some agile characteristics (speed of response for example), it does not impede agility per se. This tends to be more in tune with the views of Shalit and Yaniv (2011) that firm size determines inertia and it is this which determines agility.

Whilst there is no underestimating the importance configuration plays in the agile firm, this does need to be viewed in the context of the operating environment which is not measured as part of the study. Within the structure element of agility, configuration is negatively correlated with supply chain (rho = -0.108) and change management (rho = -0.148) suggesting sub-optimal configuration could negatively influence the efficacy of the supply chain and change capability. There is evidence of difference between the private and public sector responses which is statistically significant, with configuration explaining a significant variance in positive perception of supply chain in the private sector and negative within the public sector.

Control and Hierarchy

An extension of configuration is the level to which the hierarchy or control exerted by management influence an organisation's ability to be agile. Hierarchy and control displays many of the hallmarks seen in the response patterns of configuration and the

impact this has on agile capability. Within the survey, views are polarised at opposing ends of the management structure, with board appointees not attaching high importance to this but 38% of non-managers regarding it as highly important. This tends to support a view from the qualitative analysis (WCC) that senior levels within an organisation are blighted by delusional optimism which downplays the importance hierarchy can have on agile capability. More junior levels bear witness to an opposing view which is that senior levels overtly prevent rather than cultivate agile behaviours. Organisational size, MH feels, is largely responsible for the differing perspective on agility along the hierarchy since in large firms, middle and non-managers are typically tasked with delivering the product or service and have limited involvement in the rationale, contrasting with small organisations where even non-managers are engaged in debating key issues.

Within WCC the control and hierarchy score is 0.34, the lowest recorded which is corroborated by the non-manager interviewee illustrating a highly bureaucratic organisation where decisions are made at a senior level by individuals and teams too distant from the service user interface and this is compounded by the absence of a feedback mechanism. In part this structure is a manifestation of operating in a high-risk area (social services) but one which should be equally driven by response times. This directly mirrors the view of Kidd (1994) that hierarchical structures simply will not support agile outcomes. This also tends to support the view of Trompenaars and Hampden-Turner (1997) that hierarchies can survive in stable conditions, but need to move to flatter structures when the environment becomes less predictable. The lowest achievement score in relation to structure generally is WCC which is due to generally weak responding scores, with the weighted element for configuration of only 0.18 the lowest of all organisations. This is compounded by the lowest scores in relation to control and hierarchy and speed of response, both of which are identified within the interviews as being problematical and a source of frustration. This uncovers a dichotomy for WCC since whilst an agile response is a prerequisite for health and social care, the team are constrained by processes which serve to nullify this, although it was acknowledged that at the time of the interview, the public purse is under close scrutiny and this intensifies the element of control exerted over care packages but may equally reflect the wider public sector ethos of control.

The conviction in relation to hierarchy and control from the interviews is not consistent with the variance in importance scores within the survey, where two private sector firms (CDC and Halifax) attach higher importance than other firms. Both of these reside within

the financial arena and one board member within the interviews isolates this sector as having a high need for agility, given the fast-paced nature of change. CDC, the smallest of the participating organisations with a very 'flat' hierarchy, places an importance weighting of 32.65% on structure, the highest, but significantly also returns the highest achievement score at 31.23%. Whilst hierarchy and control is negatively correlated (rho = -0.013) to the ability to change, it is positively correlated (rho = 0.171) to adaptive strategies, or more gradual change, suggesting organisations can make subtle changes with a controlled ethos but this makes the more disruptive change difficult.

More than one private sector interviewee highlights that a flatter structure helps workers feel engaged and enables better connectivity to strategic direction, with one board level employee suggesting this helps to bring values to life rather than 'simply being posters on the wall'. A customer facing interviewee within the public sector explains how those nearest the customer are able to see where the organisation is not agile but this is simply not detected at senior levels of the organisation, consistent with the views of Van Assen et al (2000) that agility is facilitated nearer to the customer. This contrasts with a board member from the same organisation who questions whether being less structured would make them any more agile, though this appears to be an isolated view. McCann et al (2009) whilst cognisant of the need to remove layers of hierarchy do acknowledge this leads to a corresponding increase in risk. The differing view of hierarchy and control from non-managers to board level perhaps embodies the issue - it depends on perspective and which end of the management structure one resides.

Speed of Response

Although the perceived importance of speed of response as an enabler to agility is not a surprise, what is surprising is that it should be viewed more importantly *higher* up the organisation, given that non-managers may be in customer facing situations where response times are often critical. This is in keeping with a theme that the non manager population record a longer tail of importance scores. Whilst this could be due to a lack of understanding of some elements of the survey, it could equally mean a more measured and discerning approach to completion. Conversely Hormozi (2001) and Sherehiy (2008) assert that agility is more strategic in nature and therefore significant variance between board level and non-manager respondents is perhaps inevitable. Whilst agility undoubtedly has connotations of speed, this does appear to be influential in bringing about agile outcomes and is afforded high

importance in the CAM where all organisations ranked this highest, with a weighting of 6% unilaterally applied.

Breu (2001) and Glenn (2009) identify speed of response is contingent upon enabling workers to allow expeditious decisions but add a structural dimension by suggesting this is only achievable through removal of unnecessary layers. This view is fortified by the interviews which support the assertion that reduced hierarchy shortens decision time but do not conclusively reveal it made the firm more agile. Correlation analysis confirms this with a negative association between speed of response and configuration. There is a material difference between the private and public sectors with the former displaying a more pronounced negative correlation suggesting optimal configuration is more a determinant of speed in the private than public sector.

CHM attaches the same importance level as the three larger organisations to speed of response but regards itself as more adept at responding, which could be an advantage associated with size, but just as probably is an advantage of a more pedestrian rate of change which is sign-posted well in advance by central government. This and the survey responses lead to a conclusion that speed of response is determined by firm size, but agility is not, given its much wider definition.

It is evident from the interviews, particularly within the public sector, that a lack of agility at organisational level can belie rapid response capability at team level but individuals within that fast moving team do articulate frustration and even animosity towards the parent group as the overarching structure expunges agile ambitions and stifles creativity. This confirms Jackson's (1997) view that the speed of the organisation is measured by the slowest part of the group. It would appear firm size does influence speed but it appears contingent on enabling employees according to the interviews although this is not supported by correlation analysis between speed and enabling (rho = 0.103). This appears to mask a significant difference between the private and public sectors with a medium strength correlation (rho = 0.279) within the private sector contrasting with negative (rho = -0.148) within the public sector. Converting this to a z value of 1.23 however suggests the difference could be simply chance.

Supply Chain

The survey highlights the importance of supply chain management to the agile organisation, supporting the views of Christopher (2002) and Christopher et al (2004)

and fully consistent with the findings of CIPD (2011). It is felt the strategy and people policies of the organisation, whilst important in delivering agile outcomes, will be redundant without robust supply chain management to the extent that agile capability is compromised without a similarly agile and responsive supply chain.The importance of the value chain in bringing about agile outcomes does not emerge from the interviews though a similar principle applies as it does to speed of response, in that the efficacy of the value chain is determined by the slowest member (Jackson, 1997), not the fastest. It is also important for individual members of the chain to have objectives which are consistent with the chain (Backhouse and Burns, 1999). Moreover (Mason-Jones et al, 2000) suggest the efficacy of the value chain appears to rest upon the speed of information sharing across members and this is substantiated by a medium strength correlation (rho = 0.356) between the importance of the value chain and the ability to exploit information, with no discernible difference between the private and public sectors. Van Hoek et al (2001) highlight the relevance of the value chain to innovation where markets are turbulent. This is tested as part of the survey and reveals a high level of correlation (rho = 0.460). This appears to be more strongly associated within the public sector which tends to contradict the views of Van Hoek et al (*ibid*) but this outcome is not statistically significant, though it is borderline (z = -1.83) suggesting importance scores for innovation share commonality with the importance of the value chain.

Optimal positioning and alignment of the value chain, which was recognised at MH, does appear to lead to competitive advantage as suggested by Porter (1996) but whether this makes a firm more agile is inconclusive. There is a difference between sectors in relation to the importance measure placed upon the value chain although the statistical significance was marginal at the 0.05 level. One public sector interviewee uses a private sector example (Tesco) in terms of highlighting how it collaborates and shares knowledge, which he feels it is particularly accomplished at. There is evidence of strong positive correlation (rho = 0.527) between the value chain and change management and whilst interviewees are generally able to relate agility to a capability for change, none specifically feels this has wider ramifications for the value chain. Whilst relevant to both sectors, there is a statistically significant difference (z = 2.8 > 1.96) between sectors with private (rho = 0.767) and public (rho = 0.052) suggesting a much stronger relationship within the private sector.

Managing Change

McCann and Selsky (2003) and Rohrbeck (2010) assert that organisations need to build capability around both gradual and disruptive change, but additionally according to Vokurka and Fliedner (1998), an ability to respond to unpredictable change which can only be achieved if organisations can first master events of a predictable nature. The findings in relation to change patterns tested within the survey seem to contradict the view of Tether (2005) who highlights the disparate change patterns prevalent in the manufacturing and service sectors, with services more usually linked to continuous change. The ability to respond to progressive change patterns is seen as a 'hygiene' factor by a board member at MH and is the expected baseline in relation to change for any moderately successful organisation, but change of a disruptive nature carries significance due to the 'far-reaching outcomes' meaning an agile firm also needs capability to withstand this. The respondent sees less need for a capability in dealing with unpredictable change but this is largely related to house-building, where the stability of the sector diminishes the level of unpredictability.

One interview with a public sector worker highlights the difficulty they have experienced in making change programmes work, mirroring the views of Andrews et al (2008). It is suggested a 'feeling of impending crisis needs to be accomplished' for change programmes to be effective. It is felt staff are comfortable in an environment that is not subject to rapid change and having prospered under such a regime, seem prepared to accept adaptive change patterns but find disruptive change more problematical. This appears to substantiate the views of Alas (2007) that change programmes are contingent upon motivation. The interview with CHM suggests the organisation is more adept at responding to predictable change which Dove (2001) and Van Oosterhout et al (2006) suggest needs to be mastered before competence in overcoming unpredictable events can be achieved but here again CHM returns the lowest score for 'adaptive strategies' which tends to be more concerned with managing gradual change.

When asked about the nuances of progressive, disruptive and unpredictable change, a MH interviewee suggests an ability to cope with progressive should be the minimum expected of an agile organisation. For public bodies or those closely associated with central government, it is felt change tends to be sign-posted and this negates the requirement to cope with unpredictability except in exceptional circumstances, a view which tends to mirror that put forward by CHM. When viewed

across all organisations, the importance placed upon progressive and disruptive change is given greater credence than unpredictable, but at MH the importance is tilted toward disruptive change, with less emphasis on progressive and unpredictable. The issue of unpredictable change is considered more fully in the section entitled ‘co-operation’.

The Halifax interview is definitive that the agile organisation should be adept at managing disruptive and unpredictable change and this is substantiated within the survey as both are seen as important for Halifax, but so too ss progressive change which is inconsistent with the view expressed during the interview. The interviewee feels change tends to have impacts on other agility traits, with the example of poorly managed change having a profound impact on the people element (motivation and engagement). There appears to be a cultural element to change, such that organisations with a long heritage and generally long-serving people tend to be manifest in a culture which is accepting of more gradual change, which supports the view of Dove (1995) and Hormozi (2001) around the magnitude or ‘scope’ of change. It is perhaps unsurprising that the issue of change and the consequent link with agility is ambiguous since the literature is similarly inconclusive with Shalit and Yaniv (2011) associating agility with the frequency of change but Van Oosterhout et al (2006) and Dove (1995) suggesting the level of predictability.

Having considered the ‘structure’ elements of agility and discussed the importance placed upon these, I now describe the way in which the external architecture (Kay, 1993) of the organisation becomes an enabler to agility.

Co-operation

Co-operation is considered only marginally more important than customer in relation to agility with an importance score of 20.67% compared to 20.41% for customer. When taking an average across the test group, firms generally assess their achievement as outweighing the importance level but the achievement score is higher for customer (21.47%) than co-operation (21.15%). The size of organisation appears to make a material difference to the relationship between the importance and achievement score, to the extent that the three smallest firms display an achievement score which is lower than the importance score, with the large organisations demonstrating an inverse relationship.

Co-operation			
Firm size	***Name***	**Importance (%)**	**Achievement (%)**
Small	IPScape	20.65	18.68
	CHM	20.49	18.84
	CDC	21.26	19.96
Large	Halifax	20.80	22.52
	MH	20.23	21.58
	WCC	21.64	23.22.

Table 50 Matrix demonstrating importance and achievement scores for participating organisations in relation to co-operation elements of agility

WCC and Halifax, the two largest, assess themselves as high achievers in relation to cooperation which would appear to support the view of Johnston (2007) around the importance of networks which will show greater multiplicity (Zaheer and Zaheer 1997) in larger organisations. It also supports the view of Schoemaker and Day (2009) that leveraging networks is contingent with scanning the external environment, which is evident from the survey and is likely to be an issue associated with scale economies. It also supports the views of Rigg (2011) in relation to WCC that public services exist to meet societal needs and this can only be achieved by co-operation.

Alliances and Partnerships

Goldman et al (1995), in developing the original framework for agility in manufacturing, highlight the significance of utilising alliances and partnerships to enhance the customer proposition, a view echoed by Kidd (1994) and Van Hoek et al (2001) on the basis that no one organisation has the requisite skills to meet all customer requirements continually. This view is supported by Zaheer and Zaheer (1997) who link this to network theory but is challenged by Gari (1999) who suggests firms seeking competitive advantage through alliances and partnerships are often disappointed since most fail to deliver the anticipated benefits. Christensen et al (2011) suggest a failure rate as high as 90%. These opposing views are reflective of neutrality in the survey responses with use of alliances seen as material but without significant importance attached. The survey does not highlight a significant bias to the use of alliances and partnerships which assumes an importance weighting of 5% for each organisation and this would appear to contradict the findings of Goldman et al (1995), Sambamurthy (2003), Brown and Eisenhardt (1997) and Meredith and Francis (2000) all of whom place the

use of alliances as a cornerstone of the agile organisation. The reliance on alliances is not a feature which emerges from the interviews.

Despite affording this a modest importance weighting, WCC registers the highest weighted agility score for use of alliances and partnerships with high scanning and responding scores, although the reason for this outcome is uncertain since no explicit reference is made to their use in the interviews. One plausible explanation for this is how alliances are viewed by WCC, through a more traditional lens of serving the customer where WCC scores highly, or to develop competence, where the weighted score is around the median. A subsequent follow-on telephone call with the interviewee reveals the council's central role in providing services and thus a 'fully integrated service' with connections to other public departments and external suppliers. This would seem to reinforce the 6% importance weighting attached to the supply chain and the second highest weighted score amongst the participating firms.

The use of alliances and partnerships is not a theme which emerges from the interviews although staff at MH all make reference to the pain experienced following a merger in 2008, with one senior manager suggesting:

> *If I just rewind a little bit, prior to setting that growth strategy we spent probably 2, 3,or 4 years since Midland Heart was created as a result of a merger when performance dipped significantly and then we have a remedial programme to get performance back up to an acceptable level*

The difficulty experienced post merger could of course be the rigid rather than collaborative architecture at MH (Kale et al 2009). Srivastava and Frankwick (2011) and Kay (1993) suggest the fundamental benefit from forming alliances should be organisational learning and the flow of information. Correlation analysis reveals medium strength positive association between alliances and distinctive capability but this masks a notable difference between the private and public sector (rho = 0.724, 0.041 respectively). This is statistically significant with a z score of 2.55 suggesting stronger association within the private sector. Correlation is also tested for alliances against the ability to nurture competence and exploiting information. Analysis against competencies reveals low to medium strength correlation (rho = 0.259) and a similar test against exploiting information (Kay, *ibid*) shows low correlation (rho = 0.154).

Distinctive Capability

The issue of distinctive capability proves to be less important to organisations with an average importance weighting of 4%, although three organisations (CDC, CHM and WCC) attach a slightly higher significance to this. Weighted scores for distinctive capability across organisations falls within a relatively tight range from 0.40 for CHM to 0.54 suggesting there is not a high degree of clarity about the types of activity each firm can perform better than competitors. Distinctive capability proves to be an issue that is afforded some importance for the agile firm but is clearly not seen as essential, given the absence of coverage during the interviews where the development of a *wide* range of competencies seems more salient.

Although distinctive capability can be regarded as only moderately important, there is a question over whether respondents fully appreciate the underlying rationale as to why this might be important and are thus attaching significance to the first part of the question, 'the ability to perform tasks' whilst subordinating the imitability issue. There is no denying the awareness of distinctive capabilities since Drucker (1980) suggests these need to be in tune with the environment and turbulence means greater efforts are needed at renewal with Capeda-Carrion et al (2012) suggesting obsolete knowledge is a major impediment in fast-paced environments. This supports the view of Damanpour (1996) that environmental uncertainty heightens the need for decisions based upon rich and copious information. Looking at the relationship between distinctive capability and nurturing competencies, this reveals a negative correlation (rho = -0.082), suggesting the importance of these for the agile firm is not complimentary and does appear to confirm the agile organisation needs to develop a wide range of skills as insulation against unpredictable events rather than being over-reliant upon a few distinctive capabilities. This is fully concordant with absorptive capacity and is highlighted by one interviewee at MH who specifically mentions the need for a robust and diverse skill set.

The External Environment

Overby et al (2006) highlight the need for agile organisations to be adept at sensing and responding to changes in the external environment, with these capabilities being symbiotic. This creates a linkage to 'causal ambiguity' posited by Reed and DeFillippi (1990) and Ryall (2009) since difficulty in imitability serves to create a source of competitive advantage for organisations, this being especially true for agile firms. The connectivity of agile organisations to the external environment is a common theme

within the body of literature with Jackson (1997), Vazquez-Bustelo (2007) and Kotter (2012) all highlighting the importance of an 'outward-looking' organisation, appearing to contrast the caution expressed by Grant (1991) who despite being reverent to the importance of the environment, suggests this plays only a minor role in shaping profitability. The survey reveals a high importance placed upon being able to scan and respond to changes in the external environment, which shares commonality with the use of up-to-date or real time information.

External Environment			
Firm size	***Name***	**Scanning Score**	**Responding Score**
Small	IPScape	3.11	3.24
	CHM	3.25	3.56
	CDC	3.17	3.33
Large	Halifax	3.96	3.59
	MH	3.52	3.38
	WCC	3.08	3.00

Table 51 Matrix demonstrating the scanning and responding scores for participating organisations, split by size

The external environment proves the consistently most important component of co-operation with all organisations attaching a 6% importance weighting. Although there is limited evidence to support the existence of a divide between large and small organisations, Halifax the largest private sector firm achieves the highest weighted score of 0.80 with WCC registering the joint lowest. Whilst this could be symptomatic of a low rate of change in the environment, the joint lowest score is for IPScape (0.57) which operates in a rapidly changing and competitive arena. Demarcation is evident in relation to scanning and responding with the three smallest organisations registered responding scores above those of scanning, and the largest more adept at scanning than responding. This substantiates the views of Damanpour (1996) and opposes those of Liuhto (2001).

Correlation between evaluating the environment and assimilating and exploiting information is high (rho = 0.450 and rho = 0.485 respectively), suggesting strong linkage in importance. The link between evaluating the environment and assimilating information shows no material difference between sectors but a difference is evident in relation to evaluating and exploiting information. This supports the view of Carneiro (2000) who identifies a connection between knowledge and evaluating the environment but this is more relevant to innovation industries, citing IT and financial sectors. This is consistent with the sectors identified as agile within the interviews and explains the high correlation within the private sector (rho = 0.715). Moreover the strength of correlation

within the private sector suggests an almost symbiotic relationship with a coefficient of determination of 51% suggesting the ability to exploit information explains around half of the variance in scores from evaluating the environment.

Evaluating the environment is not identified specifically within the interviews but is strongly implied with the use of Virgin as an example of an agile organisation being able to scan for opportunities and respond. In addition, Apple appears to epitomise the art of 'looking for opportunities' and using 'foresight to remain one step ahead'. This contrasts with MH, which probably does not need to be agile as house-building was still felt to be an archaic industry with lots of manual intervention and traditional methods and the question was raised around how agile an organisation *can* be against a slow-paced industry back-drop.

Dealing with Unpredictability

One of the key elements of evaluating the environment is being able to respond to events of an unpredictable nature (Zhang and Sharifi, 2001, Van Oosterhout, 2006) and this is supported by the survey with a high level of correlation (rho = 0.488) and a coefficient of determination of 24%, although none of the interviews associates agility with being able to respond to unpredictable events. This appears to contradict the views of Goldman et al (1995) who are unequivocal in their view that agile organisations need to be able to respond effectively to change events which are unpredictable in nature, a view shared by Dove (1995) but the importance of this fails to emerge from the survey and the interviews.

The unpredictability issue is qualified to some extent with the view from Halifax that predicting too far into the future is prone to error, particularly in fast-moving environments and that an element of unpredictability is manifest in the business environment which serves to undermine long range planning. The view expressed is that in fast changing or emerging industries, agility is a prerequisite for survival, echoing the views of Cole (2010) but the corollary to this is that slow-moving industries or where product life cycles are longer, firms cannot always capture any benefit from agility and this is consistent with the views of Overby et al (2006) around wasted resource.

When considering agility in relation to the need for change, once again a disparate view emerges from IPScape such that an agile firm should be competent in managing

progressive and disruptive change, but given the respondent's view that agility is focused and thus bounded, there is no association with unpredictable change, opposing the views of Van Oosterhout et al (2006), Gunasekaran (1998), Dove (1995) and inconsistent with the feedback from the interview with Halifax. There is a degree of resonance with the outcome from the survey in relation to IPScape, with an equal importance weighting of 6% attached to all three dimensions of change, matched only by WCC and Halifax but the weighted score for achievement of unpredictable change is significantly lower at 0.55 than for progressive (0.76) or disruptive (0.83) change. CHM attaches a 5% importance level but the weighted score for dealing with unpredictability is only 0.25. This is more likely to be symptomatic of the reduced need for dealing with unpredictable events rather than an inability to respond to them, since most change affecting the organisation gets flagged in advance and this is confirmed in the interview with a senior manager.

Whilst many interview participants identify hierarchy and control as an issue preventing rapid decision making, particularly within the public sector, none specifically highlight the issue of being an impediment to dealing with unpredictable events. The survey reveals no correlation between hierarchy and control and dealing with unpredictability (rho = 0.009), but the difference is notable between sectors with private (rho = 0.219) suggesting a positive relationship and public (rho = -0.176) suggesting negative, although this is not statistically significant (z = 1.17). The difference can however be explained by the slow moving nature of public services (this being specifically raised by CHM, MH and WCC) and that any change tends to be sign-posted. One public sector senior manager (MH) explains:

> *I was just trying to think of scenarios. Even here where big impacts are felt from government changes, we know it's coming because they do consultations which have to go through an act of parliament, which takes forever and a day. So you have got plenty of time to kind of respond to those things and have no choice but to respond to those things but it depends how close you are to things*
>
> *I think certainly the disruptive change is one that is particularly important as that's the one that really needs addressing and the one that has far reaching outcomes potentially and obviously needs to be resourced accordingly, to give an example of that, when you see a new funding review come in and government saying to you about plans to grow and build hundreds and millions of properties but are not giving you any subsidy anymore, that's very much*

disruptive change and how are we going to deal with that and the consequences are far reaching. That's no small thing to try and address. Progressive change, I think we deal with that just in the course of our business and unpredictable change, I mean we all like to think we can predict the future don't we, I guess in other faster moving sectors, IT or finance, there is a lot of unpredictable change. And unless I'm missing something there isn't a lot of unpredictable change in our sector.

When coping with unpredictability is tested across the six groups divided around time spent with the organisation, there is evidence of statistical significance and suggests those with the organisation between eleven and fourteen years place the highest importance, with those in the three to five year group the lowest. This continues a theme of statistical significance across 'time-with-firm' groups with a general trend of high importance (for innovation, customisation and dealing with unpredictability) for newer workers, dipping for those with more experience, before spiking up amongst those with longer service. This could be explained by the robustness of the size of the groups, but additionally could be a manifestation of disenchantment or cynicism amongst those with medium to long service records. I now examine the second most important agility pillar emerging from the survey and one where participants generally feel their orgnaisation scores highly.

People

The people element of agility assumes the second highest importance weighting when all participating organisations are considered holistically, with the combined importance weighting being 27.63%, although two organisations in particular, CHM and Midland Heart (MH) appear to attach more significance to this, both recording an importance score of 28.17%. Given that CHM is engaged in the healthcare industry and MH a charitable organisation, it is perhaps not surprising agility assumes a more humanitarian aspect for these organisations, although the interviews with MH tend to highlight dysfunction in enabling staff and their ability to exploit information. CHM scores highly on the people element of agility, the interviewee regarding cultural and learning traits as being important for agile outcomes and this is reflected in a people measure of 32.86 against an importance rating of 28.17, the highest over-achievement of any of the participating organisations. In contrast to the structure element of agility, where all organisations record an achievement score below the importance weighting, the participating organisations generally give a much higher

assessment of their own capabilities in relation to people, with an average achievement score of 29.71% and all returning an achievement score above the average importance weighting (27.63%). Whilst within structure there is a clear difference between large and small organisations, this demarcation is absent from the people element, with no discernible trends identifiable.

The interviews tend to focus less on the people element of agility and this seems curious since organisational performance is largely contingent upon its people. The senior manager at Halifax suggests agile staff are needed to shape an agile organisation but this tends to be an isolated view. Although not mentioned explicitly, the interview with the HCT at MH proves illuminating as he feels the failed attempt to drive the agile agenda was thwarted largely by an ineffective engagement process.

Enabling Employees

Goldman et al (1995) highlight the issue of people in the agile organisation and more specifically of workers that were enabled. This is substantiated within the survey with a statistically significant result on the difference across sectors for the relationship between enabling employees and exploiting information, with a strong association within the private sector (rho = 0.708). There is evidence of a large correlation effect between enabling and motivating employees (rho = 0.663) and a coefficient of determination of 44%, this being relevant to the private and public sectors. Greasley et al (2007) relate an enabled workforce to creativity but a further relationship exists, according to the authors, to competence on the proviso that workers accept empowerment. Correlation analysis within the survey reveals medium strength relationship between enabling and innovation (creativity) (rho = 0.341) with a more marked influence in the private sector. Despite the importance of enabling employees within the survey, this does not emerge within the interviews either in isolation or in combination with any other agile characteristic, but I do consider this aspect of agility to be 'assumed' or regarded as a 'hygiene factor' since reference is made repeatedly to removal of controls and this clearly has implications for an enabled workforce.

Although CHM and MH attach the same importance level to the people aspect of agility, they view their achievement very differently. MH records an achievement score of 28.83%, the second lowest of all organisations, compared to CHM at 32.86%, the highest. CHM tends to regard the ability to exploit information and a culture supportive of agile behaviour as being more important than MH, with CHM

attaching a 6% importance weighting to each of these traits, compared to 5% for each at MH. On the basis that both organisations regard themselves as generally adept in these areas, this translates into a weighted agility score for exploiting information of 0.67 for CHM and 0.55 at MH, and 0.83 and 0.67 respectively for culture. This outcome for CHM seems slightly curious since a weighted score for culture of 0.83 represents the second highest yet the interview reveals a diminished need for agility which prompts the question of how workers might detect definitively whether the culture is supportive of agile behaviour.

WCC rates people as least important of any of the participating organisations with an importance weighting of 25.75%. This is significantly below the average as all five people traits are afforded importance weightings of 5% but belies a greater significance attached to co-operation. Although the importance of people in bringing about an agile organisation is subordinated, WCC scores the fourth highest achievement score with the third highest score for nurturing competencies, but this masks significant deficiencies in the ability to motivate people and a culture supportive of agility both of which are the lowest achievement scores across all firms. This appears consistent with an interview with a non-manager who highlights an organisation that is hierarchical and where decisions lacked pragmatism with limited staff involvement and this might help to explain the low achievement for motivation and culture in relation to agile behaviour.

Although CDC and Halifax represent extremes in terms of size, there are very noticeable similarities in the way they view the people element of agility, attaching the same importance level to enabling employees, motivation and exploiting information. This is perhaps not surprising as they both operate in the financial services sector, although the markets they serve are disparate. The congruence is expunged on analysis of the way these traits are operationalized within each organisation, Halifax achieves a higher weighted score for enabling employees (0.77 versus 0.57 for CDC) and exploiting information (0.72 versus 0.60 for CDC) and CDC recording a superior score for motivating people (0.68 versus 0.55 for Halifax) and these differences may well be explained by firm size. The dispersion of scores across the people traits for both organisations is identical at 0.22 (0.55-0.77 for Halifax and 0.57-0.79 for CDC).

The stand-out feature from the survey is the senior manager group where 80% of respondents attach high importance to enabling employees, a score second only to exploiting real-time information and equal in importance to speed of response for this

population, indicating the significance of enabling employees in pursuit of agile outcomes. Perhaps most surprising is this emanated from senior levels of the organisation and less of a 'pull' issue from lower hierarchical positions. It is also significant that higher levels of the organisation should place more importance on motivating employees and certainly feels counter-intuitive. When testing this within the interviews, a non-manager interviewee from WCC highlights a top-down and non-consultative approach, suggesting that there may be a perception at lower levels of the organisation which causes them to question the importance or sincerity senior individuals actually place on trying to motivate workers. The interviewee from Halifax specifically highlights financial resource and staff but is explicit that 'agile staff, make for an agile organisation' with the suggestion that leaders need to ensure staff remain motivated and this does appear to corroborate the outcome from the survey around the importance of people.

Motivating People

Alas (2007) suggests a positive relationship exists between motivation and willingness to shape change, particularly in rapidly changing environments. Correlation analysis to test motivation against the three distinct change patterns used in this study confirms a medium to high level of correlation exists within all three but with the highest for adaptive strategies (rho = 0.411) followed by change management (disruptive) (rho = 0.377) and dealing with unpredictability (rho = 0.375).

This is supported by one senior manager from the public sector (WCC) who suggests change needs to be predicated on the engagement of motivated people:

> *I would suggest that one of the things is change and this again is just my own thoughts and that's perhaps it doesn't work in organisations that are very process and procedure driven. I think there has got to be an ability or element of being prepared to take risks in a managed way but risk taking, the organisation has to be able to think outside of the box, have a willingness to change and challenge, be adaptable, and I think with all of those things you need an enthusiastic and motivated team around you.*

When conducted across sectors the relationship between change management and motivation is similar (private rho = 0.253, public rho = 0.377) but this difference is

exaggerated when considering adaptive strategies (private rho = 0.233, public rho = 0.539) suggesting a greater association within the public sector but the result is not statistically significant (z = -1.05). The most pronounced difference is the connection between motivation and dealing with unpredictable change with a very high correlation within the private sector (rho = 0.741) compared to almost no correlation within the public sector (rho = 0.080), substantiated by a result that is statistically significant with a z score of 2.54 (which exceeds 1.96).

There is also evidence that motivation is positively correlated with the ability to nurture competencies (rho = 0.507) but this is stronger within the public sector (rho = 0.617) though not evident from the interviews. When asked how motivation links to the agile firm, a board member at MH suggests it is more of an engagement and career progression issue than enrichment through development of competencies:

> *I think there's a degree that, for a lot of them, would like to make their roles more interesting and career progressing and be involved in more aspects of the business would be more exciting and career widening for them and more opportunities for them so I think it's to do with opportunity and progression.*

This however contrasts with a non-manager within the same organisation who does not see a link between motivation and agility, and certainly does not regard her own organisation as agile:

> *Probably because [top management] have more insight as to the effect of becoming more agile I wouldn't have thought motivation was one of the factors. I guess you do have to be motivated; you do have to want to push something forward. I think to be agile you have to understand your business and be almost excited about the change, understand and embrace it. I think we don't have the insight to be agile and we don't have to be we just come to work.*

Nurturing Competencies

The issue of skills and competencies is one of the agility traits that most divides the views between middle and non-managers and reveals scores from the middle manager population which might be considered 'anomalous'. The findings appear to contradict the significance attached to learning and development advocated by

Plonka (1997) and the CIPD (2011) as well as the issue of absorptive capacity advanced by Cohen and Levinthal (1990) but it should be recognised that importance scores within the survey are moderated by responses from CHM and WCC, both of whom operate in less dynamic environments. This is reflective of their weighted scores in relation to renewal and regeneration of competencies, fully reflecting the views of Shalit and Yaniv (2011) that significance of nurturing competence is proportional to the rate of environmental turbulence.

Goldman et al (1995) suggest an agile workforce needs to continually learn and assimilate new skills but this should be driven from the top of the organisation, a view shared by Teece et al (1997). Greasley et al (2007) suggest connectivity of nurturing competencies to empowerment as workers will only accept responsibility if they have the requisite skills but the notion that agile firms need a broad portfolio of skills is not supported by one board level employee at MH, suggesting the opposite may be true, advocating a narrower skills-set to avoid competence being spread to thinly:

> *I think in part, or a large part of it has got to be about resource and focus so first of all making sure you've got the right resource in terms of people and skills for what you want to do and the chances are you are not going to have them so there is some kind of resource implication. What happens is that focus is spread too widely, it's making people focus on what they are good at and really focussing on their strengths, so what I am trying to say in summary is sometimes, peoples skills are spread too thinly across what they are doing, if you are able to concentrate on things that you are particularly good at and bringing resources to deliver those extra aspects that you want to deliver*

This does appear inconsistent with the lack of importance attached to distinctive capability, to the extent that agile firms do need to display a range of skills. Another interviewee at senior manger level links competency building to innovation by using examples of organisations perceived to be agile and contrasting with those which are not:

> *You need a broad customer base as well don't you? We've mentioned Dyson, Virgin and Apple where they have a range of skills from all age groups, from all backgrounds. Unlike your HMV, who's in a narrow sector concentrated, there's that keeping pace with technology clearly key with all of them.*

The strength of culture at IPScape is balanced by the lowest weighted score for nurturing competencies at 0.49, adversely affected by a sub-optimal responding score, meaning these extremes in relation to people create the widest dispersion of scores of all firms at 0.61.Whilst the interview with the IPScape CEO zeros in on innovation and the need to bring products to market quickly, no reference is made or emphasis placed upon the skills needed to facilitate this. Although no interviewees link nurturing competencies to evaluating the environment, given the significance placed upon this by Goldman et al (1995), this is also tested and reveals a medium to high correlation (rho = 0.404) and again this association is stronger within the public sector but the reasons for this cannot be concluded from the qualitative part of the study.

Exploiting Information

Goldman et al (*ibid*) identify the ability to exploit the information an organisation acquires as a noteworthy characteristic for the agile organisation. This would appear to echo the view around the latter element of the symbiotic relationship between scanning and responding identified by Overby et al (2006), since a robust scanning capability is redundant without a corresponding ability to operationalize. This is reinforced by Dove (2001) who also refers to knowledge not being value-creating until it is used to effect change. Exploiting information is also regarded as a volume issue with Damanpour (1996) suggesting complex and rapidly changing environments intensify the need for decision making to be made using more information. When comparing exploiting information to assimilating, greater importance appears to be attached to the latter and this might help to explain why the survey outcome for all participating organisations demonstrates a higher scanning score than responding. The only exception to this is middle managers who regard both as equally important.

Carneiro (2000) suggests a link between the utility of information and evaluating the environment with this being more manifest in dynamic industries such as IT or Financials. The relationship between the external environment and exploiting information is tested as part of this study and this reveals high positive correlation (rho = 0.483) though this appears more congruent within the private sector (rho = 0.715), which is hardly surprising given the dynamic nature of the organisations involved, such as financials and telecoms. One financial services interviewee is unequivocal in his view that to be able to make good quality decisions, in fast moving environments, workers need to have access to good quality information. One potential impediment to the

exploitation of information elicited from the interviews is the dysfunctional nature of how it is shared, meaning information does not always reside with those needing it. A senior manager from MH said:

> *Even just observation of sitting in the steering group which has effectively got the executive team or standing members sometimes they will talk about a particular issue and say we're all clear on that as if the whole organisation's clear on that and I'm sitting there as a senior manager and thinking I haven't heard that! What I think happens and I think it's genuine I don't think they are trying to withhold information but talking about things on a regular basis as an executive team and therefore falling into the trap of thinking that everyone knows and understands it so things like risk appetite they clearly have discussions about things like the need to modify the appetite for risk and to be more agile in the future they then appear to think that because they have talked about it a lot that the rest of the organisation will understand that, but unless the executive team send out a really clear and specific message to the rest of the organisation, no-one's going to get it.*

This is reinforced by a board member, also from MH, who acknowledges the poor way information is distilled. This is as a result of being asked why responses from the survey around response patterns tend to be polarised between the higher and lower ends of the hierarchy:

> *I guess the thing that springs to mind instantly is that it's hardly surprising that board members and senior managers, there's a connection there, clearly with the non-exec's and execs share a lot of the same information and are party to same discussion so will inevitably get filtered down to senior managers…… it's about communication across an organisation, I know we do try to address that however, we address it in very boring ways, uninspiring ways that can be quite damaging …… we do something here in this organisation called a core brief which the directors think is good as directors have to get out to various offices and read a script about information and just talking and saying that this has changed and that has changed, it's an awful way to spread a message and actually the feedback from all of the staff is that it's terrible and they could read it themselves. If we were an organisation that listened to our staff we wouldn't still be doing it but I guess we do it to tick the box of*

communication, but communication across the organisation really is an issue ….. but it's more difficult to get the message down to the middle.

Although the cultural aspect of agility is not considered specifically by Goldman et al, Bolden (2011) does identify a number of traits evident from an agile organisation, such as cross-functional teams, speed of response and access to information which are shaped by cultural phenomena and this legitimises culture as an avenue for investigation.

Culture

IPScape attaches a high level of importance to the cultural dimension of agility with a 6% weighting but most notable is their scanning and responding scores which are markedly higher than those of other organisations. This appears consistent with the interview with the CEO where the theme of values emerges with the view expressed that values should guide the organisation and not simply become a list of aspirations on a poster. Additionally it is felt hierarchy need not be a barrier to agility if the culture is correctly oriented, but he is explicit that culture *is* integral to shaping agile outcomes. The cultural aspect of agility shows a clear demarcation based around firm size, and whilst there was no evidence that small or large firms find a culture of agility any more or less important (all attached a mix of 5-6% importance weighting) there is demonstrable difference in the self-assessment scores. The three smaller organisations feel they display a culture supportive of agility, however there is no evidence of a linear inverse relationship between firm size and culture whereby the smallest firm secures the highest weighted score and vice-versa. It is also noticeable that one of the public sector representatives, and least agile overall, registers the lowest weighted factor for culture.

Culture			
Firm size	***Name***	**Importance (%)**	**Weighted Score**
Small	IPScape	6	1.09
	CHM	6	0.83
	CDC	5	0.79
Large	Halifax	6	0.69
	MH	5	0.67
	WCC	5	0.47

Table 52 Matrix demonstrating importance and weighted scores for participating organisations in relation to culture

There appears to be an association between the ability to exploit information and the culture within the organisation with a high correlation within the public sector (rho = 0.520). Whilst there can be no underestimating the importance culture appears to have in making the organisation agile and this is supported within the survey, this does appear to be an over-arching concept since agility will not be achieved without a supportive culture. It also has connectivity to many other agile traits such as innovation, change and learning. Given this, it is perhaps surprising that culture does not feature more prominently within the interviews. One private sector worker links culture to innovation and motivation to the extent that companies with a long heritage and long-serving staff develop a culture of being 'slow-moving' and this makes culture difficult and time-consuming to alter, supporting the views of Norgaard (2001).The interviewee relates the issue to his own organisation (Halifax) where non-managers are too distant from decision making and this removes the firm's ability to fulfil the requirements of an agile enterprise. This is a contrast with another participant, also from the private sector, who suggests a large entity such as Halifax can be agile if the cultural failing can be remedied and workers are enabled, and willing to assume responsibility. He uses the example of ANP (Australia) which had a legacy of conservative stewardship but has been transformed through the use of small teams to drive the innovation agenda.

Correlation analysis revealed a medium strength relationship between culture and change management (rho = 0.361) and nurturing competencies (rho = 0.389) but a weak association with innovation (rho = 0.152) though this masked a significant difference at sector level with private sector showing negative correlation (rho = -0.237) and public (rho = 0.427) which was statistically significant (z = -2.03). This is a slightly curious outcome given the lack of perceived innovation emanating from the interviews with public sector workers, but can be explained by that population *recognising* the importance placed upon a culture of innovation even thought this is not the reality.

Having positioned the exploratory framework in chapter one, and having discussed the findings of my research, in the next section I revisit the Goldman et al (1995) work to assess its continued relevance to the modern organisation.

The continued relevance of the exploratory framework

Whilst using the work of Goldman et al (1995) as a basis for structuring this study, I was mindful that it was published more than ten years ago and this meant an inherent risk of being obsolete. However the authors do appear to be the most widely

cited in other agility studies and this adds gravitas to using this as an exploratory framework. The main issue for me as a researcher however was the extent to which a model originally developed for manufacturing could be transposed into the services arena. As I explain in the following pages, whilst some of their views appear equally relevant today and were indeed quite prophetic back in 1995, some characteristics of the agile organisation were omitted or referred to only cursorily, meaning their views lack credence with the modern organisation. Whilst this might be a by-product of the passage of time, it is equally likely to represent an over-optimistic view that agility can be formalised when in reality, it is a nebulous concept. Using abductive techniques it confirms the ontological basis for agility and that it is necessary for the modern enterprise, but how to become more agile is a contested theme. This led me to question the extent to which I could make sense of agility in terms of a theoretical framework advanced by purported 'experts' or rather the more commonplace views of practitioners, especially those at MH who were pursuing an aim to become more agile. This appears to mirror the constructivist view advanced by Denzin and Lincoln (1998) that reality is borne out of the minds of individuals and although there may be contested views, each is meaningful.

The Goldman research contextualises agility as a means to 'enrich' the customer experience and for this reason the authors emphasise developing solutions, design and mass customisation. Solutions are seen as a means to provide the customer with a product or service which is augmented by pre and post sale added-value services. Within the survey this is seen as important but does not support the significance attached in the Goldman study. Provision of solutions does appear to be more relevant to the public sector participants but this is not identified by any of the interviewees as carrying significance for agility. The authors suggest a pretext for solutions is the paradigm shift from mass production to customisation and this implies delivering solutions is simply not relevant to all industries. Wtihin this study, even within the same industry the need for solutions differs materially with Halifax providing execution-only trading where functionality, efficiency and therefore cost are key drivers in users motivation to buy. This contrasts with CDC where solutions epitomises the business model, by seeking to provide a range of integrated financial solutions, backed by a strong ethos of relationship management and ongoing support.

Whilst the Goldman publication makes reference to 'design' I extended this to innovation and design and here there is a very significant variation in outcome

between the survey and interviews. Within the survey innovation and design assumes modest importance and certainly participants use the full range of scores in responding, even at Board level. The outcomes from the interviews paint a very different picture with this seen as an essential component of agility and indeed most examples of agile firms given are innovative companies such as Apple or Dyson. The private sector generally regards itself as more adept at innovation but feedback from the public sector interviewees does suggest the structure of the organisation and the level of control placed upon workers, does impact on creativity. It would appear therefore that the views of Goldman et al (*ibid*) in relation to design (innovation) are valid, but this is clearly contingent on the organisation type and the infrasture supportive of innovation which the authors do not specifically identify. The interviews are unequivocal that 'first-mover' has an important role in shaping the agile organisation and whilst the Goldman study does not identify this specifically, it does strongly intimate this through the assertion of 'concurrency' and 'concept to cash'. To my mind this does carry connotations of speed but the interviewees are more explicit about being 'first' either with new products (such as dyson), product iterations (such as Apple's I-phone) or the ability to identify and penetrate competitive space (as in the case of Virgin).

The shift to mass-customisation provides the fundamental context for the agile organisation according to Goldman et al (*ibid*) and this proves to be a contentious issue within my research. The authors suggest the importance of mass customisation is implicit within removal of the traditional cost/ quality trade off, by suggesting consumers now demand high quality goods at low cost, with bespoking thrown in regardless of 'lot size'. This characteristic does not escape interview participants within my study meaning the views of Goldman are to some degree relevant, but thinking has advanced since 1995, to the extent that 'customisation' rather than 'mass-customisation' appears congruent. The survey however fails to support this as it wais only seen as modestly important across all managerial layers. There are two juxtaposed reasons for this; the way the question is worded in the survey focuses on delivering customised products or services to customers, which is directly derived from the wording in the Goldman audit. The responses to this are contingent on the organisation type and the market they serve, for example a bespoke provider of high-end financial solutions regards this as more significant than Halifax, an execution-only stockbroker. The wording of the question fails to capture another major contributor to customisation, which is 'lifestyle'. In other words, those interviewed regard a homogenous product which can be adapted by the consumer to their own

needs as fulfilling the customisation requirement. Thus, it appears the views of Goldman whilst providing a useful prophecy, have been superceded meaning agility is defined by 'customisation and lifestyling'.

One of the key inadequacies of the Goldman publication is that whilst identifying agility rests upon four 'pillars', it lacks the dynamism of identifying which are more important than others. This is a major impediment to practice since achieving agile capability demands resource and this can be wasted without some kind of weighting system. Within my research, Structure appears to be the most important of the four major pillars underpinning the agile organisation, though this is agnostic of firm size. Goldman does identify that structure needs to be optimised to deliver agile outcomes and a key element of this is 'delayering'. The private sector seems to grasp the relevance of this but less so within the public sector, though frustrations are voiced over the autocratic style of management and the distance workers feel from decision-making. Goldman et al (*ibid*) link configuring the organisation to reducing the level of control as punitive control has an adverse impact on innovation and experimentation, mirroring the views from WCC around stifling creativity. It is true that reduced control, such as through delayering does have a positive impact of speed of response, this being even more relevant today, but the authors fail to identify the corresponding downside of managing risk, an emergent theme from my study. This is highly relevant to the modern organisation, particularly those in regulated arenas such as the health and financial services meaning there is evidence of a three-way quality/ speed/ risk trade-off rather than the more prosaic two-way conflict of quality and speed posited by the authors. Public sector interviewees suggest robust control can be justified to mitigate risk, which the Goldman work fails to identify, but this creates a dichotomy where agile teams are subsumed within a monolithic structure, leading to disillusionment and frustration.

The authors do refer to a 'comprehensive' response to rapidly changing markets which implies an element of rapidity (speed of change) within the agile organisation but this appears one-dimensional, since change can be of varying magnitude. Within my research I focus on speed of response and here there is a clear linkage to organisational structure because a steep hieracrchy simply will not support agile behaviours, a common theme within public sector interviews and appearing to add pertinence to the Goldman view around delayering. Whilst the Goldman study is right to zero in on structure and control in particular because it improves speed of response, it does not follow that agility will follow. Whilst the degree of change within

the Goldman work is not addressed, the authors do regard the determinant of agility being the ability to respond to unpredictable change. The ability to respond to unpredictable events is seen as carrying some importance within the survey but less than the ability to respond to progressive and disruptive change. This is ratified to some degree within the interviews where dealing with unpredictability is not regarded as important, even when prompted specifically about change factors. An important differentiation here is the private sector regards the link between unpredictable change and motivation as important meaning this extreme change pattern may be sector specific. The ability to respond to progressive change is seen as a 'hygiene factor' which most organisations tend to be able to take in their stride and therefore not the exclusive domain of the agile firm, but it is coping with disruptive change (which can be predictable or undpredictable) that is regarded as most significant for driving agility. Whilst the views of Goldman et al (*ibid*) in relation to change appear well founded and still relevant, the unpredictability issue represents the apex of the change pyramid and is thus too narrow, however the notion that firms must first master predictable change mirrors my own findings.

The exploratory framework suggests one of the fundamental catalysts for agility becoming so relevant was the shortening of product life cycles, along with more rapid change in the competitive landscape but the authors say little about how impending signals of change can be identified. This is inconsistent with the results of my survey where the ability to make sense of the operating environment is unilaterally awarded the highest weighting by all participating organisations. This is not a common theme within the interviews, but was implied by the use of companies such as Virgin being adept at evaluation and subsequent response. Goldman et al (*ibid*) are clear that responding to environmental change is contingent upon other agile characteristics such good quality information but the failure to identify the link between scanning and operationalizing appears erroneous. Moreover the authors make no connection between firm size and responding to changes in the environment, but this is a clear outcome form the survey, with smaller firms better at responding than scanning, due largely to resource constraints and their larger counterparts representing the alter-ego of this.

The issue of scale carries relevance to another distinctive characteristic of the agile firm according to the Goldman study, that of co-operation in the form of alliances and virtual organisations. The basic precept is that partnering improves the skills base, learning and access to information but much evidence (Christensen et al 2011)

refutes this and one participating frim in particular (MH) voiced considerable post-merger pain. Whilst organisation size might again be relevant, with larger firms seeing alliances as a means to reduce cost and smaller ones to gain scale, it is not seen as important either within the survey or interviews, suggesting the importance has been overplayed by Goldman et al. Moreover the authors appear to have overlooked the more fundamental question about how internal elements of the supply or value chain should be configured to better serve the customer. This point is not lost on MH which admits to experiencing dysfunction when seemingly agile teams 'jarred' against those which are less agile, yet are equally important in delivering the customer proposition. Whilst alliances and partnering is not regarded as important in determining agility, it does appear to provide a means of providing solutions, particularly for small firms, an example being CDC using partners to provide niche aspects of financial planning packaged in to one coherent solution for customers. There also appears to be a sectoral demarcation which Goldman does not consider and that is the increased importance placed upon co-operation by public sector organisations in order to meet their obligations to society and this, according to Rigg (2011) can only be achieved by working collaboratively across organisational boundaries.

The issue of People is not overlooked within the Goldman research and in fact forms one of the four pillars supporting the agile organisation with the authors particularly highlighting the need for enabled and motivated workers. This is unsurprisingly supported by the findings of my own study, particularly within the private sector. However the connection between enabling and motivating carries gravitas within the private and public sectors. The survey reveals the public sector regards people as more important and this may well be a manifestation of the philanthropic nature of the services included but this does not emerge from the interviews where the people element is subordinated. Rigg (2011) suggests public services exist to address sociteal needs and this necessitates an ethos of co-operation. No people type issues emerge from the interviews but I feel this may be a consequence of motivating and enabling being seen as a 'hygiene' factor to the extent that an enabled and motivated workforce is assumed within agile firms. Goldman et al (*ibid*) suggest the people agenda needs to be driven from the top of the organisation and this extends to building and renewing competence. This issue is very relevant and is evidenced by the failure of Midland Heart to improve agility. Here, top management showed a relucatance to drive the agility initiative and expected the goal to be realised by wrongly assuming people knew what was to be expected of them. The contested

issue in relation to competence building appears to lie in whether the agile organisation should focus on deepening core or distinctive capability or develop a broad repertoire of skills. Given that distinctive capabilities are not seen as important, the suggestion is that a broad range of skills is more pertinent, and this would certainly seem to be a sensible strategy for insulating the organisation from disruptive change brought about by rapidly evolving change, meaning this element of the Goldman study continues to be relevant.

The issue of people is linked closely to exploiting information within the Goldman work, stressing the importance of access to information but the authors are less expressive on just how information should be exploited. It is clear that information is gathered from sensing capability and ultimately used but the Goldman study says nothing about what happens to it in the middle. From the survey it is very apparent organisations place high importance upon assimilating and exploiting information, and this is corroborated within the interviews with the suggestion that three issues need to be addressed – who has information, who needs it and how information gets shared. This is highly relevant to MH and proved to be one of the primary reasons for the dysfunction in the aborted journey to agility. What does seem relevant and an issue not identified by the Goldman work is the structure of the organisation. Whilst being an inhibitor to rapid decision, structure can also lead to 'information traps' where information lies in the wrong hands or is not shared effectively and this must be overcome if organisations are to respond efficiently to the changing landscape.

The fundamental reason for an organisation becoming agile is to respond the changes in the operating environment and this appears more pertinent to disruptive change. There is universal acceptance of this within the study but I remain unconvinced Goldman et al place sufficient emphasis on this and certainly fail to position this as the key influence for agile behaviour. This could be a time issue since life cycles have continued to shorten, information is more accessible, competition more intense and technology further advanced since 1995. One challenge from industry might be 'why become more agile ?' Whilst increased revenues, profits or share price cannot be guaranteed, by keeping in step with the changing environment organisations can demonstrate orientation around their customers which drives advocacy and loyalty and these should ultimately drive financial performance. The corollary is that *not* keeping in touch with the changing environment will consign the modern organisation to an also-ran, forever playing catch-up.

In the next section, I look at the development of the Corporate Agility Matrix and how this evolved in the light of survey responses.

The Corporate Agility Matrix

This was designed as a means of measuring agility and allowing comparisons to be made across organisations. The matrix is dynamic in nature since the agility score can be measured using time-series data with the outcomes affected by three independent variables – the importance weighting, the scanning score and the responding score. A copy of the original Corporate Agility Matrix is below though this was subsequently revised following completion of the survey and the interview feedback.

	Baseline				
Key Agility Factors (KAF)	**Importance Weighting**	**Scanning Score**	**Respond Score**	**Weighted Score**	**Achievement Scrore**
Customer	20.41%			2.36	21.47%
Solutions not products	0.05	3.91	3.63	0.72	
Innovation and design	0.05	3.43	2.98	0.51	
Assimilating information	0.06	3.59	3.04	0.63	
Mass customisation	0.04	3.62	3.06	0.49	
Structure	31.29%			3.05	27.67%
Configuration	0.04	3.03	2.45	0.32	
Control and hierarchy	0.04	3.38	2.90	0.43	
Speed of response	0.06	2.50	3.08	0.46	
First mover	0.00	0.00	0.00	0.00	
Supply chain	0.05	3.55	2.73	0.53	
Change management	0.06	3.90	3.13	0.69	
Adaptive strategies	0.06	3.10	3.62	0.62	
Co-operation	20.67%			2.33	21.15%
Alliances and partnerships	0.05	3.59	3.70	0.67	
Distinctive capability	0.04	3.13	3.18	0.44	
External environment	0.06	3.40	3.34	0.66	
Supply and demand drivers	0	0.00	0.00	0.00	
Dealing with unpredictability	0.05	3.08	3.38	0.56	
Appropriating benefits	0	0.00	0.00	0.00	
People	27.63%			3.27	29.71%
Enabling employees	0.06	3.56	3.60	0.72	
Motivating people	0.05	3.91	3.18	0.67	
Nurturing competencies	0.06	3.30	3.03	0.55	
Exploiting information	0.06	3.42	3.20	0.60	
Culture	0.06	3.62	3.61	0.73	
Totals	**100.00%**	**65.00**	**60.80**	11.01	100.00%

Table 53 The combined agility scores for participating organisations (original model)

By way of explanantion, the left hand column lists the identified agility traits from the literature and which are tested during the survey. The response scores from the survey are used to populate the numerical data in columns two to six. Column two scores are computed from the perceived importance attached to the agility traits by survey participants (part one of the survey). The importance score for each of the pillars is a summation of the individual traits within that category, for example customer is the total of solutions, innovation, assimilating and customisation. However since the scores for

the agility traits are rounded to two decimal places for presentation purposes, there is not an exact tally with the pillar score.

Scanning and responding scores are also derived from survey responses in relation to achievement. The survey questions on how organisations perform in relation to agility traits are coded according to whether I feel they are scanning or responding issues and scored accordingly. The weighted score in column five is a multiplication of weighting, scanning and responding and the achievement total for each pillar is again a summation of the component scores for its respective agility traits.

Whilst the existence of each of the identified agility traits is evident as carrying at least some degree of importance for all organisations taking part in the study, this could be explained by an element of bias in the positioning of the questions however this is mitigated in the questionnaire by offering respondents a range of options on a ten point scale. In mitigation, it is evident that a significant proportion of participants did use the full range of possible responses and although it is surprising that no agility trait was rated lower than 4% or higher than 6% importance level, there is clear evidence of congruence in the scores, for example, there is a very positive skew in scores relating to organisational response time suggesting agility has a very clear and distinct connotation with speed. This does contrast however with mass customisation where the opposite is true since respondents afford this a lower importance weighting, appearing to contradict the views of Goldman et al (*ibid*) who regard it as a cornerstone of the agile enterprise.

It was necessary, after testing the model, to make revisions. Following the interviews, it became apparent supply and demand drivers should be removed as these were catalysts for agile response rather than a determinant of agile capability. So too was appropriating benefits as whilst this issue was cursorily referred to in the intervoews, these were viewed as an outcome from agility rather than an input. The most prominent emerging theme from the study, risk tolerance has been added along with first-mover status. It was clear from the interviews that risk tolerance was a determinant of agile outcomes on the basis that an organisation devoid of any propensity for risk-taking will simply not achieve their agility goals. So too was the issue of first-mover, which I had originally viewed as part of innovation but was quite clearly seen as separate and complimentary, hence the decision to decouple. In the case of the revised model above, as this was recalibrated in the light of the survey and interview responses, this does need to be tested but this will form part of the longitudinal work of which this study is only the first stage.

Allowing for changes which became necessary as a result of the survey, and the subsequent interviews, the CAM has been amended slightly and this is presented below:

Key Agility Factors (KAF)	Importance Weighting	Baseline Scanning Score	Baseline Respond Score	Weighted Score	Achievement Scrore
Customer	23.10%			2.43	22.96%
Solutions not products	0.05	3.91	3.63	0.66	
Innovation and design	0.04	3.43	2.98	0.45	
First Mover	0.05	2.50	2.50	0.30	
Assimilating information	0.05	3.59	3.04	0.58	
Mass customisation	0.04	3.62	3.06	0.44	
Structure	33.08%			3.06	28.94%
Configuration	0.04	3.03	2.45	0.29	
Control and hierarchy	0.04	3.38	2.90	0.39	
Risk Tolerance	0.05	2.50	2.50	0.29	
Speed of response	0.05	2.50	3.08	0.42	
Supply chain	0.05	3.55	2.73	0.48	
Change management	0.05	3.90	3.13	0.62	
Adaptive strategies	0.05	3.10	3.62	0.56	
Co-operation	18.75%			2.11	20.00%
Alliances and partnerships	0.05	3.59	3.70	0.61	
Distinctive capability	0.04	3.13	3.18	0.40	
External environment	0.05	3.40	3.34	0.60	
Dealing with unpredictability	0.05	3.08	3.38	0.51	
People	25.06%			2.97	28.10%
Enabling employees	0.05	3.56	3.60	0.65	
Motivating people	0.05	3.91	3.18	0.60	
Nurturing competencies	0.05	3.30	3.03	0.50	
Exploiting information	0.05	3.42	3.20	0.55	
Culture	0.05	3.62	3.61	0.66	
Totals	**100.00%**	**70.00**	**65.80**	10.56	100.00%

Table 54 The combined agility scores for participating organisations (revised model)

In the revised model above, the agility scores for first mover and risk tolerance are synthetic. This is necessary because first mover is not exclusively tested within the survey, this being included within the innovation and design element. However the interviews highlight a very strong sense that first mover is *not* conjoined to innovation but regarded as a key enabler to agility in its own right, for example the ability to exploit 'white spaces' or make acquitistions. Risk tolerance is an emerging theme and is not tested in the survey which means that for the purposes of illustration, I have used mid-point response scores and importance weightings for first-mover and risk tolerance. Whilst this recalibration does alter the scores, it does not fundamentally change the order of importance of the four pillars of agility to the extent that structure is still the most important, followed by people, then customer and finally co-operation. Moreover the scanning scores for the participating organisations remain higher than the responding scores.

Whilst Zhang and Sharifi (2001) attempt to measure agility by using two separate tools, the first being an assessment of turbulence, followed by a measure of a firm's ability to be agile, this is less granular and less comprehensive than the characteristics measured in the CAM. Similarly Yauch's (2011) 'key agility index' which identifies and measures ten agile characteristics seems equally narrow, meaning the CAM contributes to theory with a broader range of (updated) measures. It also allows a means of comparing organisations using the overall agility score, which is dynamic - a manifestation of changing importance attached to each characterstic, along with an organisation's aptitude for responding to each one. Whilst reverant to the views of Rooke et al (2009) that mathematically based complexity models of firms and their respective environments cannot be regarded as predictive, merely exploratory, the CAM does make a contribution to practice through use as a diagnostic tool for senior managers to assess areas where the firm is less capable in terms of agile outcomes. This allows them to direct resource to appropriate and productive areas for bringing about increased levels of agility. The caveat to this is reflected in the views of Cunliffe (2002) that a potential limitation of a tool which aims to quantify agile characteristics, brings an element of standardisation to an issue which is complex and idiosyncratic in nature.

Summary

Of the four pillars posited by Goldman et al (1995), people and structure appear to carry most significance, based upon the organisations taking part in this study, with co-operation and the customer subordinated. The customer element of agility proves to be the most contested since it assumes a lower importance level within the survey but is widely identified as a defining characteristic within the interviews. The diminished importance within the survey is surprising given the authors suggest agility has its origins rooted in the shift from a mass production era to one of customisation. Its common citation within the interviews however, driven by the perceived importance of innovation and customisation, tends to suggest customer agility is the most important element. Innovation emerges as a key characteristic which defines the essence of an agile firm, with all examples of agile companies drawn from the manufacturing arena but as Tether (2005) suggests, this could simply be a perception issue since service based innovation tends to lack the tangibility associated with manufacturing. Mass customisation also shows inconsistency between the survey and interviews with the latter affording this characteristic far higher importance but there is also a marked

deviation from the views of Goldman et al (1995) to the extent that it is the ability to customise, not volume-driven customisation that is seen as essential for the agile firm. Moreover, a link to innovation appears to exist as provision of a product which allows users to customise (such as I-phone) is seen as equally relevant, meaning this takes on a 'lifestyle' nuance. One important deviation from the views of Goldman et al (*ibid*), the survey also elicits a view that customisation carries significance to ancillary services rather than simply product.

The theme of inconsistency between the outcomes from the survey and interviews is continued within structure, where control and hierarchy is regarded as low importance in the survey but a major determinant for agile capability within the interviews. It is very apparent that excessive control and a steep hierarchy supresses creativity and will not support agile behaviour but this depends upon the magnitude of prevailing change. Control and hierarchy supports adaptive change but makes responding to more disruptive patterns difficult. It is also seen as an impediment to speed of response and rapid decision making, though it is not related explicitly to an inability to respond to unpredictable events, but this has to be a reasonable conclusion given the effect it has on the ability to cope with disruption. Not surprisingly there are differing views on control and hierarchy from opposing ends of the structure but it appears to be more of an arbiter for the speed of decision making and therefore response times, rather than making a firm more agile per se.

I was keen to understand which aspects of agility are questioned and which are taken for granted and one noteworthy issue here appeared to be the divide between senior and junior workers such that status within the organisation does appear to have a material impact on the strength of view in relation to agility with lower level workers generally struggling to identify with the term. Bringing about agile outcomes tends to sit within the domain of customer-facing staff (non-management) yet their views of the phenomenon were distinctly taciturn. This contrasts with senior management and board members who expressed views more freely, yet in the case of MH were poor at extending this beyond the boardroom. Opposing views created a tension and evidence emerged of 'finger-pointing' (MH and WCC) where customer facing staff could clearly articulate the lack of agility being a higher management issue. This reflects the views of Richardson (2012) who suggests agility is a key differentiator of senior teams, and thus a higher order challenge. I have reflected that this appears to be a structural or cultural issue but the question is whether the hierarchical nature of each organisation influences agility based upon firm need or a

'dependency' of lower order workers to refer up. There is evidence that the agility agenda at MH was set at board level, yet their appreciation of what this might involve was hazy and they made the assumption that workers would simply 'buy-in', not to a vision of agility, but to *their* vision of agility. The overriding determinant of agility is speed of response and this is confirmed by the survey and interviews. Speed of response though is a loose term in that speed encapsulates a range of attributes such as decision-making, information sharing and exploiting opportunity. Speed is determined by firm size, agility is not but this study is conclusive that an organisation cannot achieve agility without rapidity.

When looking at the various change patterns from adaptive to unpredictable, there is an association with motivation, with higher correlation within the public sector and this might help to explain why change programmes have been difficult to implement in the past, with ineffectual employee participation, a major inhibitor. Although the survey generally fails to highlight significant differences in the importance characteristics of agility between the private and public sectors, this is manifest in relation to change and motivation. A stronger correlation exists between adaptive change and motivation in the public sector where change tends to be more pedestrian and this contrasts with a very high correlation in the private sector between motivation and unpredictable change. This suggests change (of whatever magnitude) can only be effected by a motivated workforce, conforming to the views of Quader and Quader (2009). Acquiring the skills to cope with the changing landscape rests less on distinctive capability, contrary to the views of Kay (1993) and more upon continual development of a range of capabilities, mirroring the views of Cohen and Levinthal (1990) around absorptive capacity.

Goldman et al (1995) suggest the ultimate differentiator for the agile firm lies in the ability to respond effectively to unpredictable events and whilst this seems plausible, this is not conclusive from the survey and is refuted within the interviews, where it is not regarded as important. Whilst the unpredictability issue is subordinated in importance, the ability to respond effectively to disruptive change is not, and certainly carries more gravitas than adaptive change. This is because adaptive change tends to be viewed as subtle and thus a 'hygiene factor'. This tends to echo the views of Kotter (2012) who suggests firms can manage the duality of progressive and disruptive change by allowing a slimmer traditional hierarchy to attend to more gradual change, with more profound changes off-loaded to a network. The issue of risk, or more specifically risk aversion is an emergent theme also regarded as a determinant of agile capability from the study, and is commonly cited within the public sector. Risk aversion does not preclude a firm

being agile but it might necessitate a fundamental reassessment of risk and how this is defined within the organisation or industry but one CEO suggests agility could be seen as a response mechanism to errors or risks.

In the next chapter I describle the conclusions I have drawn using abductive techniques. I start with a restatement of the research objectives and how I believe these have been met and I conclude with presentation of a new model for organisational agility to further understanding and aid practitioners.

Chapter Six

Conclusion

Introduction

This is the final section where I summarise the major themes emerging from the study. The chapter starts with a restatement of the research objectives and how I believe these have been addressed and included within this is the presentation of a new conceptual model for organisational agility (objective 5). During the formative stages of the study, my aim was to determine whether the need to become agile was shaped by demand or supply factors, and whilst this was tested within the quantitative and qualitative phases, an in-depth discussion on the issue was dropped, given the already fulsome nature of the analysis. However the demand versus supply driver for agility does provide some useful context for the model as it appears both are influential but this could be determined by the nature and maturity of the industry.

The chapter concludes with my final thoughts by providing a context for the importance of agility, a recap on the four pillars, which appear to hold most significance for practitioners and whether there are any discerning differences due to firm size or across managerial layers. Whilst presenting this information, there is a strong acknowledgement that agility appears to be an imprecise term and that many of the characteristics which constitute an agile firm are themselves hard to define.

Objective 1 – Examine the existence of factors determining organisational agility

The literature acknowledges the existence of agility characteristics without providing much clarity as to what these might be. To test this, participants in the survey were presented with a number of aspirational statements positioned as qualities it was felt might be important for an organisation to be regarded as agile and respondents were asked to score these in terms of importance. The outcomes from the survey suggest some commonality around the characteristics needed to effect agile behaviour but it is the relative importance of these which appears to differ across firms. There were however inherent ambiguities, with the survey and the interviews pointing to differing outcomes and this is perhaps not surprising when there is no agreement on what makes a firm agile and where many of the components are themselves imprecise.

Whilst understanding the relative importance of agility factors has commercial application for industry, the CAM aims to make a contribution to knowledge by building an understanding of the component parts of agility and providing a means for measuring the relative importance of these. It is believed significant gaps exist in previous studies which do not attempt to quantify agility, with no evidence found of an assessment tool which allows a means of measurement and comparisons to be made across organisations.

Objective 2 – Explore ways in which organisational agility can be quantified by the development of a measurement tool

The Corporate Agility Matrix (CAM) seeks to identify the most prominent agility traits and quantify the relative importance of these. The design and validation of the CAM was by means of a survey across six UK organisations, two of which were from the not-for-profit sector. On reviewing the literature, it was evident the behaviours or traits needed for a firm to be regarded as agile were contested. Moreover the literature review highlighted a dearth of research suggesting agility could be measured numerically. The aim of the research was therefore to develop an assessment tool which would bring about a greater understanding of the characteristics associated with being agile and to calibrate these to identify which were perceived as the most important influencers. Whilst the origins of agility are set in manufacturing, more recent literature has been concerned with its application in the services sector, but a gap exists to the extent there is virtually no evidence of any attempt to quantify agility in a way which would allow a means of comparison across organisations from varying backgrounds.

Previous attempts at measurement of agility have fallen short of a single factor which can be applied as means of comparison. The CAM assessment tool seeks to build an understanding of the component parts of agility and provide a means for measurement. My research bridges this gap in the knowledge base with the design and validation of a measurement tool which is dynamic in nature and allows a means of comparing organisations on a cross-sectional basis but additionally can form the basis of a longitudinal study. This was achieved by means of a survey across six service based organisations, using as a starting point a model originally developed for the manufacturing sector

Objective 3 – Using data, verify the validity of the model

The CAM has been tested by means of a survey conducted across a range of UK service organisations and encapsulating the views of 40 participants drawn from a range of managerial layers. The measurement tool has been recalibrated in the light of responses and is felt to carry internal validity but despite the research being conducted across a range of organisations of differing size, sectors and industrial backgrounds, the relatively small sample size of six firms, means the question of population validity or generalizability is likely to be modest as this would need to be tested on a larger sample, something the longitudinal nature of the next stage in the research aims to do. The tool is felt to have high levels of reliability since the model is populated by responses from a coded questionnaire which has been tested on a robust sample of respondents, the only caveat being the self-assessment nature of the survey could be susceptible to 'here and now' response.

Objective 4 – Using exploratory methods, examine agility from the perspective of practitioners

During the literature review it did become apparent that agility is comprised of a number of facets, making the phenomenon imprecise and with that the associated difficulties of assigning measurement. As a consequence the study evolved into a mixed methods approach with follow-on interviews, drawn from the six participating organisations and this allowed me to build an understanding of the primary capabilities needed in order to be regarded as agile. Whilst this did confirm the importance of certain agile characteristics, such as speed of response, with others it merely served to highlight the inherent ambiguities since the survey outcomes were not entirely consistent with those elicited from the interviews, such as customisation. The interviews were also valuable for identifying two emerging themes, those of risk aversion and brand, though in the interests of brevity, only the former is considered fully within this study.

Objective 5 – Present a redefined model of agility to assist development of improved practice

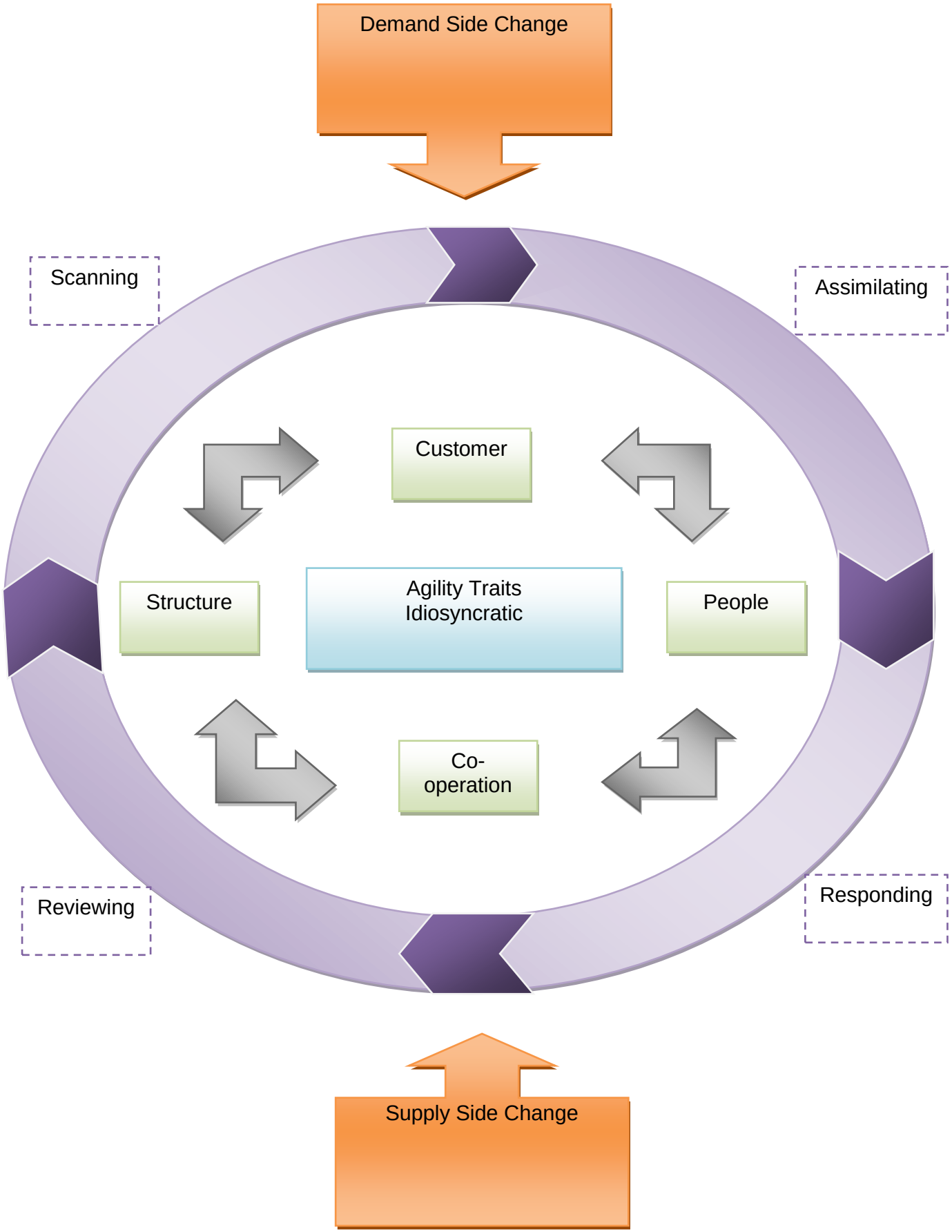
Goldman et al (1985) present a model of agility which has become a landmark publication and which has been drawn upon by many subsequent researchers but despite the passing of time, the basic four elements comprising agility (referred to here

as ‘pillars’) still appear relevant to the modern organisation. It is evident that beneath the four pillars, there are a number of agility characteristics, or traits, which carry significance for organisations of varying backgrounds, but the exact level of importance is idiosyncratic to each. The issue of whether agility translates into greater profitability has not been tested in this research but if the linkage between firm profitability and agility is contested, it does call into question why firms should aspire to be agile, reinforcing the views around appropriability put forward by Kay (1993). The updated model of organisational agility is presented in the next section.

Presentation of a new model for agility

Although the original aim of the study was to consider whether agility is demand (customer) or supply (competition) driven, this was dropped from the study for reasons of brevity. The model presented below does encapsulate the drivers for agility i.e. supply and demand since it appears it can be shaped by both, mutually or exclusively. This depends largely on the type of industry, for example one of the participants was a Wealth Manager where the need for agility is supply led because esoteric knowledge (e.g. complex investments) means customers do not know they have a need. According to the interviews, this is also true for ‘dynamic’ industries with agility being demand-led in more stable industries. Market maturity it was felt might also be a determining factor, with emerging industries also driven by supply factors (i.e. customers do not know they have a need) but as demand accelerates and customer knowledge increases, agility is driven by demand factors. Whilst plausible, this was refuted by one participant (Telecoms industry) who painted a picture of a sector that ‘feels dynamic’ but which is demand driven. This could be explained by the maturity status at the time of the interview where a transition is in place from supply to demand driven, but more likely it appears most industries are driven to agile outcomes by a mix of demand and supply-side factors. Having considered the context for agile behaviour, it seems an opportune time to present the model for agility based upon the findings in this study (this is reproduced on page 238):

Illustration 9 A revised conceptual model for agility for service organisations



The inner part of the 'donut' relates to how the organisation might be able to identify and respond to the change elements driven by external (demand or supply side) issues. Whilst there are undoubted 'inadequacies' relating to the Goldman et al (1985) model, the original four pillars proposed do still appear relevant and for this reason my proposed model does still rely on this structure. At the centre of the 'donut' sit the individual agility traits which are idiosyncratic to each organisation but can be identified using the CAM. Thus the revised conceptual model needs to be used in conjunction with the CAM as the latter will help to highlight the mix of agility characteristics needed by each firm and this makes a contribution to practice by identifying 'hot-spots' and helping senior management allocate resources more effectively to bring about improved agility.

Whilst identification of agility characteristics may be useful in understanding the factors required to become agile, they do not in themselves become a passport to successful implementation, an issue identified by Ramesh and Devadasan (2007). This is because agility is idiosyncratic and it is the *combination* of these traits which determine success for each organisation. Yauch (2011) agrees and refers to Tsourveloudis and Valavanis (2002) who state that the vagueness of the concept and 'multidimensionality' of agility naturally make metrics problematical.

Whilst the early part of this thesis articulates various defintions of agility, in the light of this research and the emergence of new themes, my own definition of agility would be 'the ability to make sense of and respond to change events of varying magnitude within an organisation's operating environment, which will be triggered exclusively or mutually by demand and supply side issues'.

Suggested areas for further study

This study aims to capture the views of practitioners in relation to how they view agility and what it means to them, but views are formed over a period of time and it is acknowledged this study represents a 'snap-shot' survey and follow-on interviews taking place at a point in time. Observation relates exclusively to the circumstances prevailing at a point in time and therefore may not serve as reliable knowledge. This dilemma would be mitigated by continuance through a longitudinal study and helps overcome an issue identified by Denzin and Lincoln (1998) that actors do not simply live *in* time, but rather form history. The authors do caution however that even repeat studies do not completely overcome this, as subsequent iterations can only ever be

similarly interpretive. Moreover, agility is not driven exclusively by people, but the interplay between people and organisational structure, meaning a case study would help to develop the understanding of this interaction.

Whilst there have been previous attempts to measure agility (Zhang and Sharifi 2001, Yauch 2011) these appear to be less granular than the characteristics measured in the CAM and this means the CAM contributes to theory with a broader range of (updated) measures and allows a means to compare organisations through an overall agility score. The CAM also serves as a valuable diagnostic tool for senior management in terms of resource allocation to those areas which might be more productive in bringing about enhanced agility. It should be acknowledged that this study could only ever aim to advance thinking and not, as was my original intention, to make a truth-claim. The combination of the CAM and insights from practitioners does further the general direction of theory but identifies a number of areas for further enquiry.

The most notable of these would be to extend the research to consider comparisons across geographical borders. This is important in the modern global economy where competition is less parochial. The main obstacle to this will be access to organisations which are willing to participate, remembering that my original aim was to incorporate a cross-border comparion, this being undermined by lack of response. Extending the scope of the study to international organisations is also likely to bring in more of a cultural influence, which was not evident from a purely UK based assessment. In fact given the importance of structural phenomena to agile outcomes (based upon the CAM), the cultural issue could uncover some significant geographical differences between say the west and east, where steep hierarchies are more ingrained.

This study deals primarily with the service sectors whereas the origins of agility are firmly rooted within manufacturing. There is no evidence of research making a comparison between the manufacturing and service based economy but this would also be useful. Within the UK, the service sectors account for a far greater proportion of GDP (PWC 2009) and this means the importance of research into making service companies more agile appears pertinent, there are clear demarcations between the two areas and the necessary blend of capabilities needed to become agile could be notably different. Thus research into a ‘compare and contrast’ would help to address this and create value for practitioners from both manufacturing and services.

One way of addressing this could be through a case study, particularly an organisation with say a manufacturing heritage but where over time, it has evolved into a more service based proposition. This would allow examination of the *journey* towards becoming agile (which MH failed to finish) and should include identification of catalysts for change and the response mechanisms. An example of this might be engineering or pharmaceuticals where traditional manufacturing has given way to a move to a different position on the value chain to focus on testing and research. This would additionally help to overcome and issue identified by Denzin and Lincoln (1998) around observing what the actor encounters and the interpretation of decisions that are made through the use of images, interactions and behaviours rather than simply a restatement of words. This carries resonance for this study since agility appears less about purely human elements but as much about purposeful action through structures and the interplay between the two.

Final thoughts

It seems appropriate to start the process of drawing this study to a close with a final evaluation of the continued relevance of the work of Goldman et al (1995), which has been used as a platform for this study. It is also necessary to summarise how using abductive techniques allows me to use a creative process to provide some inference by way of best explanation. The authors argue that the fundamental basis for agility rests on the transitioning away from mass production to one of mass customisation where firms need to be able to provide bespoke solutions, regardless of order size in response to rapid changes in the external environment. Whilst this study does not refute that, it concludes that the taxonomy of the agile firm is predicated on the four pillars suggested but much of the granular detail appears out of date. The authors also suggest the traditional trade-off between cost and quality is redundant and whilst this may be true, this study reveals this to be more complex between cost, quality and risk. The synopsis of how a firm can become more agile lacks sophistication since the original work provides no means to determine if one agile characteristic is any more relevant than another. This inhibits the usefulness of the work to the modern practitioner because just as agility characteristics are idiosyncratic to each firm, so too are the importance levels and this means managers need to understand a clearer picture of how their particular organisation can become more agile and so direct resource. The original four pillars model posited by Goldman et al (*ibid*) carries relevance but the model lacks the ability to calibrate to allow for the varying importance of each component and overlooks the important interplay revealed in this

study between structure of the organisation and its people, which carry most relevance.

Whilst the foundations of agility (and the Goldman research) lay within manufacturing, the need for agility is not confined to this arena and here the basic four pillar structure does appear transposable to services. Indeed McGrath (2013) suggests competitive advantage is shorter-lived within services, meaning agility carries *more* relevance than in manufacturing. Goldman et al identify that structure is a key determinant of agile capability and this has implcations for the speed of decision making and the importance of structure is mirrored within my study though this is more wide-reaching than impacting decision times. Goldman et al (*ibid*) regard agility as setting the agenda for an improved customer experience and while this is not substantiated by the survey, key elements of serving the customer assume high importance within the interviews such as the ability to customise and innovation. The latter point links back to structure since rigid control, often through excessive layers of management, serve to stifle experimentation and creativity but whereas Goldman et al refer to 'design' as a simile for innovation, my study suggests a wider connotation along with being first to market. The Goldman study additionally fails to identify the important role risk management plays in allowing a firm to become agile. This may be as a direct result of increased regulation and a more litigious society which was less relevant in 1995, but there is no escaping the importance of this for many sectors, with several organisations offering this as an obstacle to becoming agile.

The CIPD highlights the importance of sustaining the organisation over time and links agility to sustainable organisational performance, with their 2011 report identifying six key drivers for achieving this. Additionally the authors identify two emergent themes as enablers for sustainable performance – agility and capability building. According to the CIPD, firms need to look beyond short time horizons, even during adverse economic conditions and a key to achieving this is a change-response which is 'enduring' rather than 'knee-jerk' in nature. Sambamurthy et al (2003) identify clear linkages between agility and organisational performance. Being able to respond to customer demand rapidly heightens customer satisfaction and builds loyalty and this is mirrored by cultivating customer knowledge to exploit market opportunities. My study identies a disconnect between top management and customer facing staff in relation to agility, creating a paradox whereby agility is a response mechanism to customers, effected typically by non-managers, but this becomes dysfunctional without clear leadership and

a structure which supports rapid decision making. MH represents a clear example of this breakdown. There are undoubtedly risks attached to being agile and this is an emergent theme from the study, but whilst risk aversion is seen as a potential barrier to agility, there are risks of businesses remaining static in times of rapid changes to the environment and this has brought with it a pressure for all firms to display at least an element of agility. Goldman et al (1995) suggest delayering as a way to make a firm structure more agile but Kotter (2012) regards this as problematical, because a simplified structure still does not overcome a risk-averse and change resistant culture. My finding is that an efficient structure does provide an enabler for agility but it is more complex than simply stripping away layers and more concerned with leadership and information sharing. In fact removing managerial layers indiscriminately will actually reduce agile capability as scanning and responding both require resource endowment. Structure or the way the organisation is configured has implications for the ability to master change. More rigid structures allow for adaptive change but not disruptive or change which is less predictable but the agile firm needs to be able to respond to all. This can mean a fundamental reappraisal of change into two types with progressive regarded as a 'hygiene factor' and disruptive, which can be predicted or unpredictable.

According to Goldman et al, the shift from mass-production to mass customisation was pivotal in defining the need for agility, with Vazquez-Bustelo et al (2007) supporting the need for the duality of efficiency and customisation. Kotter (2008) recognises a watershed in that old traditional ways of setting and implementing strategy are incompatible with the pace of change meaning businesses find keeping up with change in the environment difficult, whilst getting ahead of change proves impossible. The issue of customisation is afforded lower importance in delivering agile outcomes within the survey but this is inconsistent with the outcome from the interviews where it is the most commonly occurring agile trait although reference is made to customisation, rather than mass customisation per se. The ability to customise and provide solutions are closely associated and essential components of agility, though *mass*-customisation is less relevant. Moreover, customisation can extend to product flexibility meaning customisation and 'lifestyling' is more relevant to the modern era. It is surprising that the customer element of agility should be afforded such a modest importance weighting within the survey but this amplifies the imprecise nature of agility and the differing perception with the academic view. Whilst the body of literature suggests a strong customer ideology, interview participants view agility as being more a response issue

and whilst this will undoubtedly improve the customer experience, industry seems to miss the all-embracing concept of agility.

The essence of agility is the ability to respond to changes in the environment and this means being adept at two symbiotic capabilities – scanning and responding. The basis for doing this appears to be the ability to make use of information and the study reveals a strong correlation between evaluating the environment and the ability to assimilate and exploit information. Whilst there is no material difference between the private and public sectors in the relationship between evaluating and assimilating information, there does between evaluating and exploiting information, with this assuming greater importance within the private sector. The interesting feature here is that, just as scanning and responding are symbiotic, so too are assimilating and exploiting information, with Dove (2001) suggesting information is not valued until used to effect change. However the results of the survey highlight a greater importance afforded to assimilating than exploiting which suggests an industry preoccupation with scanning over responding. The ability to scan and respond does appear to be contingent on firm-size, an issue identified by Bennis and O'Toole (1993) and this is confirmed within the survey with larger firms generally better at scanning and their smaller counterparts, typically lacking 'bandwidth' to scan, but more able to operationalize. This needs to be qualified however since small firms are better at responding, according to the survey, but all firms are weaker at response compared to scanning with the *difference* less pronounced in small firms. Organisation size is not an inhibitor to agility per se but it does appear to be the arbiter of certain other agility characteristics such as speed of response and exploiting information.

From the survey the least important of the four collective agility traits identified by Goldman et al (1995), is 'customer' which is a surprising outcome given the fundamental driving force behind the concept of agility being an era of 'mass customisation'. The average importance weighting for the customer element of agility is 20.41%, only modestly below that for co-operation, but the average achievement score exceeds the importance factor (21.47%) suggesting firms tend to view their own performance in this area favourably. There is evidence of differing perceptions of 'customer' agility at various levels of the organisation which might help to explain the view that agile capability carries significance closer to the customer interface. This is manifest in the statistically significant difference in innovation across managerial layers. The innovation issue is curious due to the difference between survey and interview responses but the latter tends to suggest innovation is the *essence* of the agile firm. A

significant extension of innovation is ‘first-mover’ which this study suggests carries greater importance with interviewees suggesting ‘being first’ has strong association with being agile. First mover extends to new products or services, product iterations or exploiting opportunities. There is evidence of division along this pillar with the three less ‘commercial’ organisations (CHM, MH and WCC) attaching greater importance to customer, in contrast to the more dynamic firms (Halifax, IPScape and CDC) who all assess their performance above the importance score but the importance weighting for each, is noticeably lower. This is inconsistent with the outcomes from the interviews which elevated the customer side of agility through the significance attached to mass customisation and innovation.

When considering agility in relation to the four major components identified by Goldman et al (*ibid*), structure assumes the highest importance in the survey across all participating organisations, but there are inconsistencies between the survey and the interviews where repeated reference is made to this being a potential inhibitor to agility, explicitly in the effectiveness of decision making and the impact this has on response times, and this is a prominent theme within the public sector. This creates tension where customer-facing teams attempt to be responsive to the needs of end-users but strategic decisions tend to be slow and ponderous. This is an area identified by McGrath (2013) within the services arena, where front line staff should be seen as an early warning signal of impending change in the environment but efficacy of this is compromised with unnecessary bureaucracy or tardy decision-making. Within the private sector there appears to be recognition of the need for reduced management layers to bring about agile capability with the issue that hierarchies create disconnect from the strategy, leading to disengagement, an issue evident from several public sector interviews. Excessive control and hierarchy impedes rapid decision making, stifles creativity and inhibits response to disruptive change but overcoming these issues lies in the role of leadership where the agile agenda should be driven from the top of the organisation, a noteworthy failing at MH. Structure assumes an importance weighting of 31.29% but the average achievement score amounts to 27.67%, suggesting firms are cognisant of their fallibilities in this area. It was noticeable that the three largest organisations tend to exhibit the greatest underperformance in relation to structure, appearing to support the views of Bennis and O’Toole (1993) and the importance placed on structure by Goldman et al (1995).

Having touched on the question of whether firm-size actually affects agile capability it seems sensible to relate this to the study and here there is evidence of duality. Firm

size does impact agility since it typically consumes resource, which smaller firms lack, but the corollary is that examples of agile firms emanating from the interviews we are all large, for example Apple and Tesco. It therefore appears the firm-size issue relates not to agility but to speed of response, which in itself seems to be regarded as a metaphor for agility, since speed of response appears to be the defining characteristic of the agile firm, supported by the survey *and* the interviews. Building partnerships helps to leverage knowledge and competence, plus by designing and streamlining processes in an optimal way the organisation is better positioned to achieve goals related to speed.
Speed of response does however appear to be an umbrella term which encapsulates decision making, scanning and information sharing. There is a difference in the importance characteristics by firm-size, most notably 'solutions' which is afforded more importance by the larger participating organisations but this could easily be a resource issue with larger firms enjoying scale economies. The study also reinforces the view of Jackson (1997) that agility can be regarded as size-agnostic since an organisation is only as agile as the least agile component and this is very evident from the study with WCC the largest entity having teams that strive to be, and are, agile but 'landlocked' within a monolithic and cumbersome organisation, and this creates tension and even animosity. Whilst the cultural element wais not specifically highlighted either in the survey or interviews and there is not a linear relationship between firm size and a culture supporting agility, the smaller organisations feel they have a culture more conducive to facilitating agile outcomes.

Co-operation is considered only marginally more important than customer in relation to agility with an importance score of 20.67% but firms generally view their achievement as exceeding the importance level (21.15%). Here once again the size of organisation appears to have an influence on the relationship between the importance and achievement score, such that the three smallest firms display an achievement score which is lower than the importance score, with the large organisations demonstrating an inverse relationship with the two largest, WCC and Halifax, assessing themselves as high achievers in the regard. This would appear to support the importance of networks which shows multiplicity in larger organisations and may well be an issue associated with scale economies. Alliances and partnerships are not in themselves a recipe for agility but a correctly configured and aligned value chain (which may include external partners) is necessary. Frustrations emerge when agile teams 'jar' against slow-moving or ponderous teams for partners in a network.

The people element of agility assumes the second highest importance weighting with a score of 27.63%, although two organisations in particular, CHM and Midland Heart (MH) appear to attach more significance to this which may be idiosyncratic to the sectors concerned. That said, interviews with MH tend to highlight sub-optimal performance in enabling staff and the ability to exploit information. Leadership undoubtedly sets the tone for the people element of agility, particularly enabling and developing competencies, though this study concludes agility rests on a repertoire rather than one or two distinctive capabilities. In contrast to the structure element of agility, where all organisations record an achievement score below the importance weighting, the participating organisations generally give a much higher assessment of their own capabilities in relation to people, with an average achievement score of 29.71%. A culture which supports agility is important in the same way that a culture can support innovation. This is contingent on frim size with the more diminutive more able to support this. An agile culture appears weaker in public services, which is explained by the hierarchical structures which in turn embody people issues such as enablement. Whereas in considering structure there is a clear difference between large and small organisations, this demarcation is absent from the people element, with no discernible trends identifiable but the perceived high attainment score could easily be attributed to delusional optimism.

It has been established that agility is an imprecise term but with acknowledgement that it is necessary for the modern organisation to aspire to but the path to this is via a plethora of characteristics which appear at least partly relevant to all organisation types, but where the exact importance level is idiosyncratic. Goldman et al (1995) acknowledge the ways in which an organisation becomes agile rest on a number of individual traits which are more granular in detail than the original four ‘pillars’ and that these are not homogenous across organisations. Despite this basic assertion, the Goldman model whilst relevant to manufacturers in 1995, lacks the sophistication to meet the demands of the modern era which is characterised by more rapid and frequent change. I also feel this lack of refinement renders it to be of only superficial use within services since the dynamics of change appear more acute and this necessitates a more relevant and coherent model. In considering the response patterns from the various organisations taking part in the study, it does appear that notwithstanding the vagaries as to what being agile means for each organisation, there is an acknowledgement that the business world has changed to such an extent that agility holds relevance to all industries to a greater or lesser degree. Put another way, all participants accept there is a need for agility but the level of significance differs and the exact component parts

which make an agile form appear to be founded upon ‘fuzzy logic’ (Bottani 2009). Thus it would appear agility represents a continuum and a firm’s position on this is determined by the need level (which was not part of this study), the configuration of agility traits (which is idiosyncratic to each organisation), the ability to scan and finally respond, the latter two elements being symbiotic.

Whilst the initial aspiration for the study was to assign measurement to agility to allow inter-firm comparisons to be made, the amorphous nature and the complexity of the construct, lead me towards an abductive method of enquiry. Here interpretivist synthesis of knowledge, related to observation, allows application to context by asking whether the theory generated aids understanding of experience. In the case of this study, inference of case from rule and result results in probability, but does not create a ‘truth’. Thus using abductive techniques I can define the rule as agility being concerned with identifying change within the environment and response is based upon a complex mix of characteristics, which are idiosyncratic but lacking precise composition. The result is that evaluating the environment, using and sharing information along with speed of response are prerequisites for being agile, supported by other hallmarks. The case inferred therefore is that organisational agility is imprecise, complex and customer centric but cannot be achieved with speed in isolation, with speed resting on efficient structures and enabled and motivated people.

This study makes a contribution to the commercial world and theory. Understanding the relative importance of agility factors has commercial application for industry and overcomes an issue identified by Saaty (1980) that decision making is impeded when there are multiple factors and the decision-maker lacks clarity around the relative importance attached to each factor. The CAM sets out to assist strategic decision makers since it can provide guidance on the appropriateness of resource allocation to bring about effective response to changes in the environment. From a theory perspective, learning has been advanced to the extent that the original model developed by Goldman et al (1995) has been updated in the light of more recent literature and the resultant model tested for efficacy within the service and not for profit sectors.

10. References

Aaker, D. Mascarenhas, B. (1984) The Need for Strategic Flexibility. *Journal of Business Strategy.* Fall 1984, pp 79-81

Agar, M. (1986). *Speaking of Ethnography.* Beverley Hills: Sage

Alas, R. (2007). The Impact of Employee Participation on Job Satisfaction During Change Process. *Problems and Perspectives in Management.* Vol 5, Iss 4, pp 28-34

Allee, V. (2009). Value-creating Networks: Organizational Issues and Challenges. *The Learning Organization.* Vol 16, Iss 6, pp 427-442

Alves, A. Dinis-Carvalho, J. Sousa, R. (2012). Lean Production as Promoter of Thinkers to Achieve Companies' Agility. *The Learning Organization.* Vol 19, Iss 3, pp 219-237

Andrews, J. Cameron, H. Harris, M. (2008). All Change ? Managers' Experience of Organisational Change in Theory and Practice. *Journal of Organisational Change Management.* Vol 21, Iss 3, pp 300-314

Ariely, D. (2010). You Are What You Measure. *Harvard Business Review.* Vol 88, Iss 6, pg 38

Babbie, E. (1986). *The Practice of Social Research.* Belmont: Wadsworth

Backhouse, C. Burns, N. (1999). Agile Value Chains for Manufacturing – Implications for Performance Measures. *International Journal of Agile Management Systems.* Vol 1, Iss 2, pp 76 -82

Baker, J. (1996). *Agility and Flexibility: What's the Difference ?*. Cranfield School of Management: ISBN 1 85905 088 3

Balnaves, M. Caputi, P. (2001) *An Introduction to Quantitative Research Methods: An Investigative Approach.* London: Sage Publications Ltd

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. J*ournal of Management.* Vol 17, Iss 1*,* pp 99-120

Bennis, W. O'Toole, J. (1993). Large Vs Small. *Executive Excellence.* Vol. 10, Iss. 6, pg 3

Birch, A. (2012) Lecture on Statistical Methods: Birmingham City University, 16th May 2012

Black, S. Morrison, J. (2010). A Cautionary Tale for Emerging Market Giants. *Harvard Business Review.* Vol 88, Iss 9, pg 99

Bland J. Altman, D (1997). 'Statistics Notes'*. British Medical Journal.* 22nd February [online] available at www.bmj.com/content (accessed 24th May 2012)

Blaxter, L. Hughes, C. Tight, M. (2006) *How to Research (3rd edition).* Buckingham: Open University Press

Blenko, M. Mankins, M. Rogers P. (2010). The Decision Driven Organisation. *Harvard Business Review.* Vol 88, Iss 6, pp 54-62

Bolden, R. (2011). Distributed Leadership in Organisations: A Review of Thoery and Research. *International Journal of Management Reviews.* Vol 13, Iss 3, pp 251-269

Bottani, E. (2009). A Fuzzy QFD Approach to Achieve Agility. *International Journal of Production Economics.* Vol 119, Iss 2, pp 380-391

Bowling, A. (2002). *Research methods in health: Investigating health and health sciences*. (2nd edition). Maidenhead: Open University Press.

Branson, C. (2008). Achieving Organisational Change Through Values Alignment. *Journal of Educational Administration.* Vol. 46, Iss. 3, pg. 376

Breu, K. Hemingway, C. Strathern, M. Bridger, D. (2001) Workforce Agility: The New Employee Strategy for the Knowledge Economy. *Journal of Information Technology.* 17, pp 21-31

Brown, S. Eisenhardt, K. (1997). The Art of Continuous Change: Linking Complexity Theory and Time-Paced Evolution in Relentless Shifting Organisations. *Administrative Science Quarterly.* Vol. 42. pp 1-34

Bruce, M. Daly, L. Towers, N. (2004). Lean or Agile: A Solution for Supply Chain Management in the Textiles and Clothing Industry. *International Journal of Operations & Production Management.* Vol. 24, Iss. 1/2; pg. 151

Buono, A. Bowditch, J. Lewis, J. (1985) When Cultures Collide: The Anatomy of a Merger. *Human Relations.* Vol. 38, Iss. 5, pp 10-17

Burdett, J. (1993) Managing in the Age of Discontinuity. *Management Decision.* Vol. 38, Iss. 1, pp 10-17

Burrell, G. Morgan, G. (1979). *Sociological Paradigms and Organisational Analysis*. London: Heinemann.

Capron, L. Mitchell, W. (2010). Finding the Right Path. *Harvard Business Review.* Vol 88, Iss 7/8, pg 104

Carneiro, A. (2000). How does Knowledge Management Influence Innovation and Competitiveness ? *Journal of Knowledge Management.* Vol 4, Iss 2, pg 87

Cartwright, A. (1988). Interviews or Postal Questionnaires ? Comparisons of Data About Women's Experiences with Maternity Services. *The Milbank Quarterly.* Vol 66. pp 172-189

Cartwright, S. Cooper, C. (1993). The Role of Culture Compatibility in Successful Organisational Marriage. *The Academy of Management Executive.* Vol. 7, Iss. 2 pp 57-69

Cepeda-Carrion, G. Cegarra-Navarro, J. Jimenez-Jimenez, D. (2012). The Effect of Absorptive Capacity on Innovativeness: Context and Information Systems Capability as Catalysts. *British Journal of Management.* Vol 23, Iss 1, pp 110-129

Chartered Institute for Personnel Development (CIPD) (2011). *Shaping the Future: Sustainable Organisation Performance. What Really Makes a Difference*. London

Christensen, C. Bower, J. (1996). Customer power, Strategic investment and the failure of leading firms. *Strategic Management Journal.* Vol. 17, pp 197-218

Christensen, C. Overdorf, M. (2000). Meeting the Challenge of Disruptive Change. *Harvard Business Review.* Vol 78, Iss 2, p 66

Christensen, C. Alton, R. Rising, C. Waldeck, A (2011). The New M&A Playbook. *Harvard Business Review.* Vol 89, Iss 3, pp 49-57

Christopher, M. Towill, D. (2000). Supply Chain Migration from Lean and Functional to Agile and Customised. *Supply Chain Management.* Vol. 5, Iss. 4, pg 206

Christopher, M. (2002). You are Lean but Are You Agile ? *PPI.* Vol. 44, Iss. 5, pg 3

Christopher, M. Lowson, R. Peck, H. (2004). Creating Supply Chains in the Fashion Industry. *International Journal of Retail and Distribution Management.* Vol. 32, Iss. 8/9, pg 367

Cohen, W. Levinthal, D. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly.* Vol. 35, Iss. 11. pp. 128-152

Cole, A. (2010). Lecture on Delivering Innovation: Birmingham City University, 12th July 2010

Collins, D. (1999). Born to Fail ? Empowerment, ambiguity and set overlap. *Personnel Review.* Vol. 28, Iss. 3, pp 208-222

Coolican, H. (1996). *Introduction to Research Methods and Statistics in Psychology*. (2nd edition). London: Hodder and Stoughton.

Corcitto, M. Youssef, M. (2003) The Human Side of Organizational Agility. *Industrial Management and Data Systems.* Vol 103, Iss 5/6, pp 388-397

Damanpour, F. (1996). Organizational Complexity and Innovation: Developing and Testing Multiple Contingency Models. *Management Science.* Vol. 42, Iss 5, pg 693

Darr, E. Argote, L. Epple D. (1995). The Acquisition, Transfer, and Depreciation of Knowledge in Service Organizations. Productivity in Franchises. *Management Science.* Vol 41, Iss 11, pp 1750-1750.

D'Aveni, R. (1994). Hypercompetition: The Dynamics of Strategic Manoeuvring. New York: Free Press.

Davis, J. Atkinson, T. (2009). Need Speed ? Slow Down. *Harvard Business Review.* Vol 88, Iss 5, pg 30

Davis, J. Frechette, H. Boswell, E. (2010). *Strategic Speed: Mobilize People, Accelerate Execution.* Boston, Harvard Business Press

Denzin, N. Lincoln, Y. (1998). *The Landscape of Qualitative Research: Themes and Issues.* California: Sage

DeRose, K. (2005). What is Epistemology ? A Brief Introduction to the Topic. [online]. Available at http://pantheon.yale.edu/~kd47/What-Is-Epistemology.htm (Accessed 20th September 2012)

De Treville, S. Trigeorgis, L. (2010). It May be Cheaper to Manufacture at Home. *Harvard Business Review.* Vol 88, Iss 10, pp 84-87

Dove, R. (1995). Measuring Agility: The Toll of Turmoil. *Production.* Vol 107, Iss 1, pp12-14

Dove, R. (2001) *Response Ability: The Language, Structure and Culture of the Agile Enterprise.* New York: John Wiley & Sons

Drayton, B. Budinich, V. (2010). A New alliance for Global Change. *Harvard Business Review.* Vol 88, Iss 9, pp 56-64

Drucker, P. (1980). *Managing in Turbulent Times.* Oxford: Butterworth-Heinemann Ltd

Dyer, L. Shafer, R. (1998) *From Human Resource Strategy to Organizational Effectiveness: Lessons from Research on Organizational Agility*. New York: Centre for Advanced Human Resource Studies, (Working Paper 98-12)

Easterby-Smith, M. Thorpe, R. Lowe, A. (1991) *Management Research: An Introduction.* London: Sage Publications

Eisenhardt, K. (1989). Making Fast Strategic Decisions in High Velocity Environments. *Academy of Management Journal.* Vol. 32, Iss 3, pg 543

Eisenhardt, K. (1989b). Building Theories from Case Study Research. *Academy of Management Review* Vol. 14, Iss 4, pp 532-550

Eisenhardt, K. Martin, J. (2000). Dynamic Capabilities: What are they ? *Strategic Management Journal.* Vol 21, Iss 10/11, pp 1105-1121

Eisenhardt, K. Graebner, M. (2007). Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal.* Vol 50, Iss 1, pp 25-32

Elliott, L. (2011). 'UK Faces Life in Slow Lane as World Looks to Asia and Latin America'. *Guardian.* 7th January [online] available at www.guardian.co.uk/business/2011 (accessed 6th Sept 2011)

Elliott, L. (2011). 'Osborne on Target to Hit Deficit Reduction Targets'. *Guardian.* 22nd November [online] available at www.guardian.co.uk/business/2011 (accessed 28th Nov 2011)

Erande, A. Verma, A. (2008). *Measuring Agility of Organizations – A Comprehensive Agility Measurement Tool*. Old Dominion University: ISBN 978-1-60643-379-9

Ettenson, R. Conrado, E. Knowles, J. (2013). Rethinking the Four Ps. *Harvard Business Review.* Vol 91, Iss 1/2, p 26

Fetterman, D. (2010). *Ethnography: Step by Step*. Los Angeles: Sage

Field, A (2006). Reliability Analysis. *C8057 (Research Methods ll): Reliability Analysis.* http://www.statisticshell.com/docs/reliability.pdf (accessed 8/11/13).

Fliedner, G. Vokurka, R. (1997). Agility: The Competitive Weapon of the 1990s and Beyond. *Production and Inventory Management Journal.* Vol 38, Iss 3, pg 19

Folz, D. (1993). A Culture of High Performance. *Executive Excellence.* Vol 10, Iss 2, pg17.

Frery, F. (2006). The fundamental dimensions of strategy. *MIT Sloan Management Review.* Fall 2006

Gale S. (2012) Agility Ability. *PM Network.* Vol 26, Iss 10, pp 54-61

Gari, G. (1999) Leveraging the Rewards of Strategic Alliances. *Journal of Business Strategy.* Vol 20, Iss 2, pp 40-43

Geertz, C. (1973). *The Interpretation of Cultures: Selected Essays:* New York: Basic Books

Gill, J. Johnson, P. (1997) *Research Methods for Managers (2nd Edition).* London: Sage Publications

Giniat, E. (2011). Using Business Intelligence for Competitive Advantage. *Healthcare Financial Management.* Vol 65, Iss 9, pp 142-146

Glenn, M. (2009). Organisational Agility: How Business can Survive and Thrive in Turbulent Times. *Economist Intelligence Unit*. March 2009, pp1-25

Goldman, S. Nagel, R. Preiss, K. (1995). *Agile Competitors and Virtual Organizations: Strategies for Enriching the Customer*. New York: Van Nostrand Reinhold

Gonin, D. Napiersky, U. Thorsell, J. (2011). Innovation in Leadership Development. *Advances in Global Leadership.* Vol 6, pp 155-215

Govindarajan, V. Trimble, C. (2010). Stop the Innovation Wars. *Harvard Business Review.* Vol 88, Iss 7/8, pg 80

Govindarajan, V. Trimble, C. (2011). The CEO's Role in Business Model Reinvention. *Harvard Business Review.* Vol 89, Iss 1/2, pg 113/4

Grant, R. (1991). *Contemporary Strategy Analysis.* (6th edition). Oxford: Blackwell Publishing

Greasley, K. Bryman, A. Dainty, A. Price, A. Naismith, N. Soetanto, R. (2007). Understanding Empowerment From an Employee Perspective: What does it Mean and Do They Want it ? *Team Performance Management.* Vol 14, Iss 1/2, pp 39-55

Greene, C. Ellis, B. Waller, M. (2008). Can Lean and Agile Exist Simultaneously ? Comparative Analysis Through Literature Case Studies. *Industrial Engineering Research Conference.* Vancouver. (2008)

Guillen, M. Garcia-Canal, E. (2010). How to Conquer New Markets with Old Skills *Harvard Business Review.* Vol 88, Iss 11, pp 118-122

Gunasekaran, A. (1998). Agile Manufacturing: Enablers and an Implementation Framework. *International Journal of Production Research.* Vol 36, Iss 5, pp 1223-1247.

Gurd, B. (2011). 'Moving Towards Agility: The Contribution of a Balanced Scorecard System'. *Academy of Management Annual Meeting.* San Antonio 16-19th August 2011

Hallgren, M. Olhager, J. (2008). Lean and Agile Manufacturing: External and Internal Drivers and Performance Outcomes. *International Journal of Operations & Production Management.* Vol 29, Iss 10, pp 976-999.

Hamel, G. Prahalad, C. (1994). *Competing for the Future.* USA: Harvard Business School Press

Hamel, G. (2001). Smart mover, dumb mover. *Fortune.* Vol. 144, Iss. 4, pp 191-193

Han J. Kim, N. Srivastava, R. (1998). Market Orientation and Organizational Performance: Is Innovation a Missing Link ? *Journal of Marketing.* Vol 62, Iss 4, pg 30

Handy, C. (1976). *Understanding Organisations (4th Edition).* London. Penguin

Handy, C. (1994). *The Empty Raincoat: Making Sense of the Future.* London. Hutchinson

Haneberg, L. (2011). Training for Agility. *Training and Development.* Vol 65, Iss 9, pp 50-58

Hargadon, A. Sutton, R. (2000). Building an Innovation Factory. *Harvard Business Review.* Vol 78, Iss 3, p 157

Harrison, R. (1972). Understanding Your Organisation's Character. *Harvard Business Review.* Vol 50, Iss 3 pp 119-128

Hayes, R. Wheelwright, S. (1979). Link Manufacturing Process and Product Life Cycles. *Harvard Business Review.* Vol 57, Iss 1, pp 133-140

Herzberg, F. (1968). One More Time: How do you Motivate Your Employees ? *Harvard Business Review.* Vol 46, Iss 1, pp 53-62

Heylighen, F. (2000). Referencing pages in Principia Cybernetica Web in F. Heylighen, C. Joslyn, V. Turchin (editors). *Principia Cybernetica Web* (Principia Cybernetica, Brussels), Url http://cleamc11.vub.ac.be/REFERPCP.html (accessed 20th September 2012)

Hofstede, G.J. (2005) *Cultures and Organisations; Software of the Mind.* New York: McGraw-Hill Companies

Hormozi, A. (2001) Agile manufacturing: The next logical step. *Benchmarking. Vol 8*, iss 2, pp 132-143

Hoyt, J. Huq, F. Kreiser, P. (2007). Measuring organizational responsiveness: the development of a validated survey instrument. *Management Decision, 45*(10), 1573-1594.

Huy, Q. Mintzberg, H. (2003) The Rhythm of Change. *MIT Sloan Management Review.* Vol 44, Iss 4, pp 79-84

Hyer, J. Gregersen, H. Christensen, C. (2009). The Innovators DNA. *Harvard Business Review.* Vol 87, Iss 12, pg 63

Jackson, D. (1997). *Dynamic Organisations: The Challenge of Change.* London: MacMillan Press.

Jackson, M. Johansson, C. (2003). An Agility Analysis from a Production System Perspective. *Integrated Management Systems.* Vol 14, Iss 6, pp 482-488

Jacobs, E. (2010). Navigating Cultural Difference. *Financial Times (London).* 20 July 2010 P14

Johnson, G. Scholes, K. Whittington, R. (1998). *Exploring Corporate Strategy – Text and Cases.* (7th edition). Harlow: Pearson Education

Johnston, K. (2007). Extending the Marketing Myopia Concept to Promote Strategic Agility. *Journal of Strategic Marketing.* Vol 17, Iss 2, pp 139-148

Kale, P. Singh, H. Raman, A. (2009). Create Three Distinct Paths for Innovators. *Harvard Business Review.* Vol 87, Iss 7/8, pg 28

Kalling, T. (2003). Knowledge Management and the Occasional Links with Performance. *Journal of Knowledge Management.* Vol 7, Iss 3*,* pg 67

Kanter, R. (1999). From Spare Change to Real Change. *Harvard Business Review.* Vol 77, Iss 3, pg 122

Kay, J. (1993). *Foundations of Corporate Success. How Business Strategies Add Value.* Oxford: Oxford University Press

Kay, J. (2006). *The Hare and the Tortoise.* London: Erasmus Press

Kay, J. (2012). Fetish for Making Things Ignores Real work. *Financial Times (London).* 14th November 2012

Khalifa, M. Yan Yu, A. Ning Shen, K. (2008). Knowledge Management Systems success: A Contingency Perspective. *Journal of Knowledge Management.* Vol 12, Iss 1*,* pp 119-132

Kidd, P. (1994). *Agile Manufacturing: Forging New Frontiers.* Great Britain: Addison-Wesley

Kidder, L. Judd, C. (1986). *Research Methods in Social Relations (5th Edition).* London: Holt, Rinehart and Winston

Kim, W. Mauborgne, R (1997). Value Innovation: The Strategic Logic of high Growth. *Harvard Business Review.* Vol 75 Iss 1 pp 102-112

Kinnear, P. Gray, C. (2004). *SPSS 12 Made Simple.* East Sussex: Psychology Press

Kirby, J. (2010). Wall Street is no Friend to Radical Innovation. *Harvard Business Review.* Vol 88, Iss 6 pg 38

Kohn, A. (1993). Why Incentive Plans Cannot Work. *Harvard Business Review.* Vol 71, Iss 5 pp 54-63

Kotter, J. (1995). Leading Change: Why Transformation Efforts Fail. *Harvard Business Review.* Vol 73, Iss 2 pg 59

Kotter, J. (2008). *A Sense of Urgency.* USA: Harvard Business School Press

Kotter, J. (2012). Accelerate: How the Most Innovative Companies Capitalize on Today's Rapid-Fire Strategic Challenges – and Still Make Their Numbers. *Harvard Business Review.* Vol 90 Iss 11 pp 44-58

Krishnamurthy, R. Yauch, C. (2007). Leagile Manufacturing: A Proposed Corporate Infrastructure. *International Journal of Operations & Production Management.* Vol 27, Iss 6, pp 588-604.

Lampel, J. Mintzberg, H. (1996) Customising Customisation. *MIT Sloan Management Review.* Vol 38, Iss 1, pp 21-30

Leonard-Barton, D. (1992) Core Capabilities and Core Rigidities: A paradox in Managing New Product Development. *Strategic Management Journal.* Vol 13, pp 111-125

Lim, L. Acito, F. Rusetski, A. (2006) Development of Archetypes of International Marketing Strategy. *Journal of International Business Studies.* Vol 37, Iss 4, pg 499

Lind, D. Marchal, W. Wathen, S. (1994). *Basic Statistics for Business and Economics (5th Edition).* New York: McGraw Hill

Liuhto, K. (2001). How Much Does Size, Age or Industry Membership Matter in Transition ? Studying Change in Organisational Performance in Almost 1000 Post-Soviet Companies. *Problems of Economic Transition.* Iss 43, pp 6-49

Lloyds Banking Group (2011). UK Wealth Proposition. London 7th March 2012

MacMillan, I. McGrath, R. (1997). Discovering New Points of Differentiation. *Harvard Business Review.* Vol 75, Iss 4, pg 133

Mankins, M. (2004). Stop Wasting Valuable Time. *Harvard Business Review.* Vol 6, Iss 1, pg 5

Martin, R. (2010). The Execution Trap. *Harvard Business Review.* Vol 88, Iss 7/8, pp 64-71

Martinez-Sanchez, A. Vela-Jimenez, M. Luis-Carnicer, P. Perez-Perez, M. (2007). Managerial Perceptions of Workplace Flexibility and Firm Performance. *International Journal of Operations and Production Management.* Vol 27, Iss 7, p714

Maskell, B. (2001). The Age of Agile Manufacturing. *Supply Chain Management.* Sept 2004.

Mason-Jones, R. Naylor, B. Towill, D. (2000). Engineering the Leagile Supply Chain. *International Journal of Agile Management Systems.* Vol 2. Iss 1, pg 54

Matlay, H. (2010) Lecture on Qualitative Research Methodology: Birmingham City University, 13th November 2010

McCann, J. Selsky, J. (2003) Strategically Managing Organizational Boundaries: Moving from Fragility to Resiliency. *MIT Sloan Management Review.* xxxxxx

McCann, J. (2004). Organizational Effectiveness: Changing Concepts for Changing Environments. *HR Human Resource Planning.* Vol 27, Iss 1, pg 42

McCann, J. Selsky, J. Lee, J. (2009) Building Agility, Resilience and Performance in Turbulent Environments. *People & Strategy.* Vol 32, Iss 3, pp 44-51

McCarthy, I. Tsinopoulos, C. (2003). Strategies for Agility: An Evolutionary and Configurational Approach. *Integrated Manufacturing Systems.* Vol 14. Iss 2, p103

McGrath, R. (2013). Transient Advantage. *Harvard Business Review.* Vol 91, Iss 6, pp 62-70

McGregor, D. (1960). *The Human Side of Enterprise.* New York: McGraw Hill

Meredith, S. Francis, D. (2000). Journey Towards Agility: The Agile Wheel Explored. *The TQM Magazine.* Vol 12, Iss 2, pg 137

Mikkelsen, B. (2005). *Methods for Development Work and Research: A New Guide for Practioners (2nd Edition).* New Delhi: Sage

Miller, D. Friesen, P. (1984). *Organisations: A Quantum View.* Englewood Cliffs New Jersey: Prentice Hall

Miller, D. (1986). Configurations of Strategy and Structure: Towards a Synthesis. *Strategic Management Journal.* Vol 7, Iss 3, pp 233-249

Miller, D. (1987). The Genesis of Configuration. *Academy of Management Review.* Vol 12, Iss 4, pp 686-701

Miller, D. (1996). Configurations Revisited. *Strategic Management Journal.* Vol 17, Iss 7, pp 505-512

Mitchell, J. (1983). Case Studies and Situational Analysis. *Socialogical Review* Vol 31, Iss 2, pp 187-211

Nairan, R. Yadav, R. Sarkis, J. Cordeiro, J. (2000). The Strategic Implications of Flexibility in Manufacturing Systems. *International Journal of Agile Management Systems.* Vol 2, Iss 3, pg 202

Norgaard, M. (2001). Motivating People. *Executive Excellence.* Vol 18, Iss 6, pg19.

Nunes, P. Breene, T. (2011). Reinvent Your Business before it's Too Late. *Harvard Business Review.* Vol 89, Iss 1/2, pp 80-87

O'Conner, G. Corbett, A. Pierantozzi, R. (2009). Create Three Distinct Paths for Innovators. *Harvard Business Review.* Vol 87, Iss 12, pg 78

Ofek, E. Wathieu, L. (2010). Are you Ignoring Trends that Could Shake up your Business ?. *Harvard Business Review.* Vol 88, Iss 7/8, pp 124-131

Ogbonna, E. Harris, L. (2002). Organizational Culture: A Ten Year, Two-phase Study of Change in the UK Food Retailing Sector. *Journal of Management Studies.* Vol 39 Iss 5, pp 673-706

Ohmae, K. (1988). Getting back to strategy. *Harvard Business Review.* Vol. 66, Iss. 6, pp 149-157

Overby, E. Bharandwaj, A. Sambamurthy, V. (2006). Enterprise Agility and the Enabling Role of Information Technology. *European Journal of Information Systems.* Vol 15, Iss 2, pp 120-131

Oxford English Dictionary. (1990). London. Oxford University Press

Pallant, J. (2007). *SPSS Survival Manual (3rd Edition).* Berkshire: McGraw Hill

Palmberg, K. (2009). Complex Adaptive Systems as Metaphors for Organisational Management. *The Learning Organisation.* Vol 16, Iss 6, pp 483-498

Plonka, F. (1997). Developing a Lean and Agile Workforce. *Human Factors and Ergonomics in Manufacturing.* Vol. 7, Iss. 1, pp 11-20

Popper, K. (1959). *The Logic of Scientific Discovery.* London: Hutchinson

Porter, M. (1996). What is Strategy ? *Harvard Business Review.* Nov/Dec. pp61-78

Prahalad, C. Hamel, G. (1990). The Core Competence of the Corporation. *Harvard Business Review.* May/ June. Pp79-91

Punch, M. (2005). *Introduction to Social Research: Quantitative and Qualitative Approaches (2nd Edition).* London: Sage

PWC. (2009). The Future of UK Manufacturing: Reports of its Death are Greatly Exaggerated. Available at: http://www.pwc.co.uk/eng/publications

Quader, M. Quader, M. (2009). A Critical Analysis of High Performing Teams: A Case Study Based on the British Telecommunication (BT) PLC. *Journal of Services Research.* Vol 8, Iss 2, pp 175-216

Ramaswamy, V. Gouillart, F. (2010). Building the Co-Creative Enterprise *Harvard Business Review.* Vol 88, Iss 10, pp 100-109

Ramesh, G. Devadasan, S. (2007). Literature Review on the Agile Manufacturing Criteria. *Journal of Manufacturing Technology Management.* Vol 18, Iss 2, pp 182-201

Reed, R. DeFillippi, R. (1990). Causal Ambiguity: Barriers to Imitation and Sustainable Competitive Advantage. *Academy of Management. The Academy of Management Review.* Vol *15, Iss* 1, pp 88-102.

Reynolds, M. (2011). Reflective Practice: Origins and Interpretations. *Action Learning and Research Practice.* Vol 8. Iss 1, pp 5-13.

Richardson, M. (2012). Agility is King. *Business Strategy Review.* Vol 23. Iss 2, pp61-63

Rigby, C. Day, M. Forrester, P. Burnett, J. (2000). Agile Supply: Rethinking Systems Thinking, Systems Practice. *International Journal of Agile Management Systems.* Vol 2. Iss 3, p178

Rigg, C (2011). Systemic Action and Learning in Public Services. *Action Learning and Research Practice.* Vol 8. Iss 1, pp 15-26.

Robie, C. Brown, D. Beaty, J. (2007). Do People Fake on Personality Inventories ? A Verbal Protocol Analysis. *Journal of Business and Psychology.* Vol 21. Iss 4, p489

Rohrbeck, R. (2010). 'Towards a Maturity Model for Organizational Future Orientation', *Academy of Management Annual Meeting.* Montreal (August 2010). Berlin Institute of Technology, P6

Romanelli, E. Tushman, M. (1994). Organisational transformation as punctuated equilibrium. An empirical test: *Academy of Management Journal.* Vol 37, Iss 5, pp 1141-1167

Rooke, J. Koskela, L. Kagioglou, M. (2009). Informality in Organisation and Research: A Review and Proposal. *Construction and Management Economics.* Vol 27. Iss 10, pp 913-922

Roper, S. Youtie, J. Shapira, P. Fernandez-Ribas, A. (2010). Knowledge, Capabilities and Manufacturing Innovation: A USA-Europe Comparison. *Regional Studies.* Vol 4, Iss 3, pp 253-279

Ryall, M. (2009). Causal Ambiguity, Complexity, and Capability-Based Advantage. *Management Science.* Vol 55, Iss 3, pp389-403

Saaty, T. (1980). *The Analytic Hierarchy Process.* New York: McGraw Hill

Sambamurthy, V. Bharadwaj, A. and Grover, V. (2003) Shaping Agility Through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms. *MIS Quarterly*. Vol. 27, Iss. 2, pp. 237-263

Sapsford, R. (1999). *Survey Research.* London: Sage Publications Ltd

Sarker, S. Munson, C. Sarker, S. Chakraborty, S. (2009). Assessing the Relative Contribution of the Facets of Agility to Distributed Systems Development Success: an Analytic Hierarchy Process Approach. *European Journal of Information Systems.* 18, pp 285-299

Satirenjit, K, Renganathan, S. (2010). Strategies for Gaining Access in Doing Fieldwork: Reflection of two Researchers. *Electronic Journal of Business Research Methods,* Vol. 8, Iss 1, pp. 42-50

Schoemaker, P. Day, G. (2009). How to Make Sense of Weak Signals. *MIT Sloan Management Review.* Vol 50, Iss 3, pp 81-89

Schweiger, D. (1983). Is the Simultaneous Verbal Protocol A Viable Method for Studying Managerial Problem Solving and Decision Making ? *Academy of Management Journal.* Vol 26, Iss 1, pp 185-192

Seymour, D. McCabe, S. (2007). Reconciling Theory and Practice: The Principles of Action Research Reconsidered. International Symposium Towards the Formation of Theory for the Built Environment, Salford.

Shafer, R. Dyer, L. Kilty, J. Amos, J. Ericksen, J. (2001). Crafting a Human Resource Strategy to Foster Organisational Agility: A Case Study. *Human Resource Management.* Vol 40, Iss 3, pg 197

Shalit, B. Yaniv, E (2011). 'Organisational Agility'. *Academy of Management Annual Meeting.* San Antonio 16-19th August 2011

Shekar, O. (2010). Imitation is More Valuable than Innovation. *Harvard Business Review.* Vol 88, Iss 4, pg 28

Sherehiy, B. (2008). Relationships between agility strategy, work organization and workforce agility. Ph.D. dissertation, University of Louisville, United States -- Kentucky. Retrieved January 24, 2011, from ABI/INFORM Global.(Publication No. AAT 3308333).

Skinner, W. (1974). The Focussed Factory. *Harvard Business Review.* Vol 47, Iss 3, pp 113-122

Srivastava, P. Frankwick, G. (2011). Environment, Management Mttitude and Organisational Learning in Alliances. *Management Decision.* Vol 49, Iss 1, pg 156

Suarez, F. Lanzolla, G. (2005). The Half-Truth of First-Mover Advantage. *Harvard Business Review.* April 2005

Svennevig, J. (1997). Abduction as a methodological approach to the study of spoken interaction. University of Oslo Oct 1997. Url http://home.bi.no/a0210593/Abduction%20as%20a%20methodological%20.pdf (accessed 15th October 2013)

Tabachnick, B. Fidell, L. (2007). *Using Multivariate Statistics (5th edition).* Boston: Pearson.

Teece, D. Pisano, G. Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal.* Vol 18, Iss 7, pp 509-533

Tether, B. (2005). Do Services Innovate (Differently) ? Insights from the European Innobarometer Survey. *Industry and Innovation.* Vol 12, Iss 2, pp 153-184

Thomke, S. (2001). Enlightened Experimentation: The New Imperative for Innovation. *Harvard Business Review.* Vol 79, Iss 2, pg 67

Thompson, A., Strickland, A. and Gamble, J. (1978). *Crafting and Executing Strategy. The Quest for Competitive Advantage (1st edition*). New York: McGraw-Hill/ Irwin

Thorpe, R. Gold, J. Lawler, J. (2011). Locating Distributed Leadership. *International Journal of Management Reviews.* Vol 13, Iss 3, pp 239-250

Trompenaars, F. Hampden-Turner, C. (1997). *Riding the Waves of Culture: Understanding Cultural Diversity in Business.* London. Nicholas Brealey Ltd.

Van Assen, M. Hans, E. Van de Velde, S. (2000). An Agile Planning and Control Framework for Customer Order-driven Discrete Parts Manufacturing Environments. *International Journal of Agile Management Systems.* Vol 2. Iss 1, pp 16-23

Van Hoek, R. (2000). The Thesis of Leagility Revisitied. *International Journal of Agile Management Systems.* Vol 2. Iss 3, pg 196

Van Hoek, R. Harrison, A. Christopher, M. (2001). Measuring Agile Capabilities in the Supply Chain. *International Journal of Operations & Production.* Vol 21, Iss 1/2, pp 126

Van Oosterhout, M. Waarts, E. Van Hillegersberg, J. (2006). Change Factors Requiring Agility and Implications for IT. *European Journal of Information Systems.* Vol 15, Iss 2, pp 132-145

Vazquez-Bustelo, D. Avella, L. Fernandez, E. (2007). Agility Drivers, Enablers and Outcomes: Empirical Test of an Integrated Agile Manufacturing Model. *International Journal of Operations & Production.* Vol 27, Iss 12, pp 1303-1332

Vermeulen, F. Puranam, P. Gulati R. (2010). Change for Changes Sake. *Harvard Business Review.* Vol 88, Iss 6 pp 70-76

Vesey, J. (1991) New Competitors Think in Terms of 'Speed to Market'. *S.A.M Advanced Management Journal.* Vol 56, Iss 4, pp 26-33

Vokurka, R. Fliedner, G. (1998). The Journey Toward Agility. *Industrial Management and Data Systems.* Vol 98, Iss 4, pg 165

Volberta, H. (1997). Building Flexible Organisations for Fast-moving Markets. *Long Range Planning.* Vol 30, Iss 2, pp 169-183

Von Hippel, E. Thomke, S. Sonnack, M. (1999). Creating Breakthroughs at 3M. *Harvard Business Review.* Vol 77, Iss 5, p 47

Walsh, P. Bryson, J. Lonti, Z. (2007). 'Jack be Nimble, Jill be Quick': HR Capacity and Organisational Agility in the New Zealand Public and Private Sectors. *Asia Pacific Journal of Human Resources.* Vol 40, Iss 2, pp 177-192

Weick, K. (1995). *Sensemaking in Organisations*. London: Sage

Wheelen, T. Hunger, J. (2000). *Strategic Management and Business Policy.* (11th edition). New Jersey: Pearson Prentice Hall.

Womack, J. Jones, D. Roos, D. (1990). *The Machine that Changed the World.* London. Simon & Schuster.

Yaghoubi, N. Kazemi, M. Dahmardeh, M. Arhami, F. (2011). Organisational Agility: A Way to Import the Advantageous Aspects of Competitive Market (An Analytical-Comparative Approach on Agility Models). *Interdisciplinary Journal of Contemporary Research in Business.* Vol 2, Iss 12, pp 766-783

Yauch, C. (2011). Measuring Agility as a Performance Outcome. *Journal of Manufacturing Technology Management.* Vol 22, Iss 3, pp 384-404

Youssef, M. (1992) Agile Manufacturing: A Necessary Condition for Competing in. *Industrial Engineering.* Vol 24, Iss 12, pp 18-20

Yusuf, Y. Adeleye, E, Sivayoganathan, K. (2003). Volume Flexibility: The Agile Manufacturing Conundrum. *Management Decision.* Vol. 41, Iss 7, pg 613

Zaheer, A. Zaheer, S. (1997). Catching the Wave: Alertness, Responsiveness and Market Influence in Global Electronic Networks. *International Journal of Production Economics.* Vol 61, Iss 1/2, pp 7-22

Zhang, Z. Sharifi, H. (1999). A methodology for Achieving Agility in Manufacturing Organisations: An Introduction. *Management Science.* Vol 43, Iss 11, pg 1493

Zhang, Z. Sharifi, H. (2000). A methodology for Achieving Agility in Manufacturing Organisations. *International Journal of Operations and Production Management.* Vol 20, Iss 4, p496

Zhang, Z. Sharifi, H. (2001). Agile Manufacturing in Practice: Application of a Methodology. *International Journal of Operations and Production Management.* Vol 21, Iss 5/6, p772

Zhang, Z. Sharifi, H. (2007). Towards Theory Building in Agile Manufacturing Strategy – a Taxonomical Approach. *IEEE Transactions on Engineering Management.* Vol 54, Iss 2, pp 351-370

Zigmund, W G. (2000). *Business Research Methods.* (6th edition). USA: Dryden Press, Harcourt College publishers

Appendix 1

	CDC	CHM	Halifax Share-dealing	IPScape	Midland Heart	Worcestershire County Council
Sector	Private	Private	Private	Private	Charity[1]	Public
Nature of Business	Wealth Manager	Healthcare Provider	Execution only stockbroker	Telecoms	Housing Provider	County Council
Ownership	Limited Liability Partnership	Limited Liability Partnership	Wholly owned subsidiary of Lloyds Banking Group	Share Capital	Registered Charity	Accountable to central government
Number of employees	7	45	300	40	1600	5000
Primary Contact	CEO	Operational Manager	Finance Director	CEO	Head of Change and Transformation	Head of Adult Social Care

1 Although a registered charity, MH activities are exclusively linked to the public sector

Appendix 2 – survey invitation letter

I am currently researching a PhD on the subject of Organisational Agility with Birmingham City University (BCU).

Whilst there is commonality around a definition for agility and recognition that it is composed of a collection of facets, there is no clarity on the relative importance of the component parts in diverse organisations. The purpose of the study is therefore to build a greater understanding of what actually makes some organisations more agile than others and the extent to which this is influenced by the type of organisation or even geographical boundaries. The continued development of agility carries an allure for corporations, particularly within the private sector, although this commercial perspective is becoming increasingly evident within the public sector.

The aim of the research will be to produce a diagnostic tool to allow comparability of agility across sectors and international boundaries. In terms of providing a focal point, the research objectives will be:

Objective 1 – Examine the existence of factors which determine organisational agility
Objective 2 - Establish how the importance of these differs across industry sectors and geographical boundaries
Objective 3 – Explore ways in which organisational agility can be quantified by developing a measurement tool
Objective 4 – Test organisational agility models originally developed for use in the manufacturing sector for efficacy within service industries
Objective 5 – The extent to which larger organisations are able to capture the benefits associated with smaller enterprises
Objective 6 – To consider whether agility is demand or supply led

You can help with my research by agreeing to take part in a survey. The time needed to complete this will vary but this should take approximately 30-40 minutes. All information provided within the survey is confidential and no names or other information which might identify you will be published or shared with your employer.

The survey consists of 3 parts and instructions for each part are included within the survey. There are no right or wrong answers, it is your honest views that I welcome. If you have any questions in relation to the research please feel free to give me a call on 07802 541308. Alternatively you can contact my research supervisors at BCU – Dr Steve McCabe or Prof Mike Brown.

To start the survey simply press ‘cntrl’ and click on the link below. When you have finished, click ‘submit’
http://www.bcu.ac.uk/_media/misc/hosted/agility/agility_3.htm
Thank you for your participation

Regards

Andrew Mann
Room F116, Feeney Building, Birmingham City University

Appendix 3 - Copy of the survey questionnaire (Excel Version)

Introduction - About You	Please complete this section to let us know about you and the organisation you work for					
What is the name of the organisation you work for ?						
Which of the following best describes your current position ?	Board Level Management	Senior Level Management	Middle Management	Non-Managerial		
How long have you worked for your current organisation ?	Less than 1 year	Between 1 and 2 years	Between 3 and 5 years	Between 6 and 10 years	Between 11 and 15 years	More than 15 years

Part 1	In your opinion, how important are the following factors in determining if your organisation can be regarded as agile ?	
	Please complete all questions in this section by indicating how important you think the following statements are in relation to your organisation. Mark 10 for 'very important' and 1 for 'not important'. There are no right or wrong answers, it is your opinion we value	
An agile organisation seeks to provide a complete package of solutions to customers rather than just a product or service	1	10
An agile organisation places an emphasis on design and innovation	1	10
Workers within an agile organisation make use of 'up to date' information	1	10
An agile organisation delivers customised products or services to customers regardless of order sizes	1	10
An agile organisation is defined by the way in which it is structured	1	10
The level of agility displayed by an organisation is detemined by the level of control exerted by leaders and management	1	10
An agile organisation is able to respond quickly to changes in its operating environment	1	10
An agile organisation works in partnership with its suppliers to meet customer needs	1	10
An agile organisation is able to manage disruptive change successfully	1	10
An agile organisation has the ability to keep up with modest but constant change	1	10
An agile organisation makes use of partnerships and alliances with other organisations to help satisfy customer needs	1	10
An agile organisation has the ability to perform tasks in ways competitors find it hard to copy	1	10

An agile organisation is constantly reviewing and responding to changes in the environment in which it operates	1	10
An agile organisation has the ability to respond effectively to changes which are unpredictable in nature	1	10
Workers within an agile organisation are given flexibility and empowered to make decisions	1	10
An agile organisation places importance on making sure its workers are highly motivated	1	10
An agile organisation continually improves its skills base through the development and training of its workers	1	10
An agile organisation is able to respond rapidly to information or knowledge it has acquired	1	10
Agility is determined by the culture within the organisation	1	10

Part 2	In your opinion, how well do you think the organisation you work for performs in relation to the following behaviours ?
	Please complete all questions in sections A-D by indicating whether you agree or disagree with following statements in relation to your organisation. Mark 5 for 'strongly agree' and 1 for 'strongly disagree'. If you do not know, or neither agree or disagree, choose 3. There are no right or wrong answers

Section A - Your customers

	For Official Use KAF	Base		
Our organisation places importance on customer satisfaction	SP	S	1	5
Our organisation measures customer satisfaction levels	SP	S	1	5
Our organisation consistently exceeds customer expectations	SP	E	1	5
Our organisation regards added value activities such as delivery or after sales as being equally important as the product or service provided	SP	E	1	5
Our organisation can customise its products or services to individual customer needs	SP MC	E	1	5
Our customers expect our organisation to produce goods and services which are customised for their needs	SP	S	1	5
Our customers expect our organisation to produce goods and services which are low in price	SP	S	1	5
Our customers expect our organisation to produce goods and services with a better quality than our competitors	SP	S	1	5
Our customers expect our organisation to provide excellent after-sales back-up and support	SP	E	1	5
Our organisation is able to identify early changes in the competitive environment	ID	S	1	5
Our organisation is able to quickly identify changes in demand for our products and services	ID	S	1	5
Our organisation actively benchmarks our innovation efforts against industry leaders	ID	S	1	5

Our organisation communicates or showcases its innovation efforts across all departments and teams	ID	S	1	5
Our products and services are shaped by feedback we receive from our customers	ID	S	1	5
Our organisation is able to work on a number of different innovations at the same time	ID	E	1	5
Our organisation uses small teams drawn from various areas of the business to design our products and services	ID	E	1	5
Our organisation tends to favour improvements to existing products or services rather than design something radically new	ID	E	1	5
Our organisation targets new products and services to generate a required percentage of total revenue	ID	E	1	5
Our organisation can bring new products and services to market more quickly than our competitors	ID	E	1	5
All processes and methods for bringing products and services to market are easily accessible to teams within our organisation	ID	E	1	5
In our organisation we have time to think, reflect and be creative	ID	S	1	5
Our organisation uses real time information when evaluating the competitive environment	AI	S	1	5
The use of up to date information helps our organisation to drive innovation	AI	S	1	5
The use of up to date information helps our organisation to make strategic decisions quickly	AI	E	1	5
Important decisions within our organisation are only made once many alternatives have been evaluated	AI	E	1	5
Our organisation tries to anticipate changes within the competitive environment	MC	S	1	5
Our organisation aims to balance efficiency with providing customisation to customers	MC	S	1	5
Our organisation is able to respond to changes in the competitive environment in which we operate	MC	E	1	5
Our organisation is able to respond to changes in customer tastes but within limitations	MC	E	1	5
Our organisation is able to respond rapidly to special requests from customers	MC	E	1	5

Section B - The structure of your organisation

The structure of our organisation is flexible to allow us to exploit changes within our competitive environment	CF DU	S	1	5
Our organisation is structured to specifically allow us to respond rapidly	CF	S	1	5
Our organisation is structured to enhance our efficiency	CF	S	1	5
The way we are structured sometimes makes responding to situations difficult	CF	E	1	5
The Chief Executive or Managing Director within our organisation has a dominant influence	CF	E	1	5
Most of the restructuring that has taken place within our organisation has been to remove layers of management rather than add extra layers	CH	E	1	5
Employees within our organisation are encouraged to think for themselves and make decisions without having to refer to a supervisor	CH SR	E	1	5

Employees at all levels within our organisation are encouraged to contribute to decision making	CH	S	1	5
Our organisation looks for ways to remove bureaucracy to improve decision times	CH	S	1	5
Each business unit within our organisation establishes its own specific goals but within the broad mission statement laid down by the organisation	CH	S	1	5
Risks can be taken only at senior levels within our organisation	CH	E	1	5
Senior managers within our organisation coach and inspire rather than direct staff	CH	E	1	5
Workers within our organisation are tightly controlled	CH	E	1	5
High level decision making within our organisation is generally quick	SR	E	1	5
Decisions which affect the day to day running of our organisation are generally made quickly	SR	E	1	5
Our organisation is good at responding rapidly to changes in its competitive environment	SR	E	1	5
Our organisation has a capability to change rapidly which our competitors find it hard to copy	SR	E	1	5
Our organisation is good at removing barriers which prevent us from serving our customers	SR	E	1	5
Suppliers to our organisation (suppliers are other organisations who supply us with components, technology, equipment, raw materials for example) are treated as trusted partners	SC	S	1	5
Our organisation changes its suppliers frequently	SC	S	1	5
Our organisation works with suppliers who share a common objective of complete customer satisfaction	SC	S	1	5
Information about customers such as changing tastes, gets passed efficiently to all our suppliers	SC	E	1	5
All suppliers used by our organisation are able to respond rapidly to changes in the competitive environment	SC	E	1	5
Our organisation is effective at meeting changing goals or objectives	CM	E	1	5
Looking for ways to improve is actively encouraged within our organisation	CM	S	1	5
Our organisation is able to anticipate the need for change	CM	S	1	5
Change within our organisation tends to be driven by top management	CM	E	1	5
Our organisation only changes once our competitors have done so	CM	E	1	5
Our organisation is good at adapting to changes in the competitive environment	AS	E	1	5
Our organisation is able to respond effectively to unpredictable change when it occurs	AS	E	1	5
Change within our industry tends to be constant but modest	AS	S	1	5
Change within our industry tends to be infrequent but significant when it does occur	AS	S	1	5

Section C - Co-operating with other organisations

Our organisation actively seeks alliances with other organisations in order to improve the products and services we offer to customers	AP	S	1	5
Our organisation often forms alliances with other organisations to work on specific tasks or projects	AP	S	1	5
Within our organisation we use teams drawn from a variety of business areas to work on key projects	AP	E	1	5
Most alliances our organisation has formed in the past have not been successful	AP	S	1	5
Our organisation is part of a network of organisations which work together to share information and learning	AP	S	1	5
Our organisation is very clear about what it can do better than any of its competitors	DC	S	1	5
What our organisation does better than others is very difficult for competitors to copy	DC	S	1	5
Our organisation is better at scanning for changes to our competitive environment than actually responding to these changes	DC	S	1	5
Our organisation is better at responding to changes in our competitive environment than identifying early change signals	DC	E	1	5
Our organisation compares how it is performing against 'best in class' industry leaders	EE	S	1	5
Our organisation tends to be internally focussed, paying less attention to changes in our external environment	EE	S	1	5
Our organisation is adequately resourced to enable employees to make sense of changes going on within our industry	EE	S	1	5
There are limited boundaries within our organisation which enables us to respond to changes in our competitive environment	EE	E	1	5
When trying to identify changes within our competitive environment, our organisation is usually able to see the 'big' changes but sometimes misses the more subtle changes	EE	S	1	5
Our organisation is able to use information we have gathered to act decisively	EE	E	1	5
Our organisation is adequately resourced to enable employees to respond to changes going on within our industry	EE	E	1	5
Our organisation usually designs new products or services in partnership with our customers	SD	NS	1	5
Our organisation usually designs new products or services in partnership with other organisations	SD	NS	1	5
On occasions when our organisation has to respond quickly, this is usually due to changes in customer demand	SD	NS	1	5
On occasions when our organisation has to respond quickly, this is usually due to changes within the industry or competitor actions	SD	NS	1	5
Our organisation is able to respond quickly to events that we could not have predicted would happen	DU	E	1	5
When designing new products or services within our organisation we complete each stage in the process one after the other until we are ready to launch	DU	E	1	5

When designing new products or services within our organisation we are able to complete various stages in the process at the same time	DU	E	1	5
To help us cope with unpredictable changes that affect our organisation, we assemble teams drawn from a range of disciplines, often at short notice	DU	E	1	5
Trying to think about and help shape the future of our organisation gets left due to everyday work pressures	DU	S	1	5

Section D - People within your organisation

Our organisation promotes a culture where individuals and teams are empowered to make decisions	EV	E	1	5
It is easy for me to see how my actions contribute to the success of the organisation	EV	S	1	5
Our organisation actively promotes learning and devleopment to enable employees to be more effective	EV NC	E	1	5
Our organisation actively promotes the sharing of information between employees and teams	EV	S	1	5
When teams are formed within our organisation they are given a clear definition of the task	EV	E	1	5
Our organisation provides employees with the opportunity to work on challenging tasks	MP	E	1	5
Within our organisation, risk-takers who fail are often rewarded for initiative	MP	E	1	5
Our organisation is genuinely committed to motivating its employees	MP	S	1	5
I understand how my performance will be measured	MP	S	1	5
Within our organisation, staff are encouraged to take responsibility for solving problems rather than escalting the issue to a supervisor	MP	E	1	5
Reward systems within our organisation tend to focus on individual performance	MP CL	E	1	5
Reward systems within our organisation tend to focus on team performance	MP CL	E	1	5
Reward systems within our organisation tend to focus on performance of individuals and teams	MP CL	E	1	5
People within our organisation are so focussed on reward that they pay less attention to the importance of the actual work they are doing	MP	S	1	5
Employees within our organisation are expected to demonstrate how much learning activity they have undertaken as part of their performance review	NC	E	1	5
In our organisation the skills of our people are treated as highly valued assets	NC	S	1	5
Customers choose us because of the knowledge and skills within our organisation	NC	S	1	5
A greater emphasis is placed upon skills and learning than products or services within our organisation	NC	S	1	5
Our organisation promotes learning to enable employess to respond to changes in our competitive environment	NC	S	1	5
Our organisation tends to rely on past success which means we sometimes find it hard to make change work	NC	S	1	5

Our organisation has found its skills base out of tune with what is needed to compete in our markets	NC	S	1	5
Our organisation is better at making alterations to existing processes than designing anything radically new	NC	E	1	5
Information within our organisation is ditributed to empower employees	EI	S	1	5
Communication is good within our organisation	EI	E	1	5
We sell, rent or lease access to our information systems to other organisations	EI	E	1	5
Our organisation shares information across teams to enable us to improve our products and services	EI	S	1	5
Information and feedback about our customers is actively shared around our organisation to enable us to improve our products and services	EI SP	S	1	5
Our ourganisation is good at transferring knowledge we acquire into innovation	EI	S	1	5
Our organisation believes knowledge and learning has a positive impact on organisational performance	EI	E	1	5
Our organisation acquires knowledge and information from a wide variety of sources	EI	S	1	5
My own personal values seem to be closely aligned with those of our organisation	CL	S	1	5
The culture within our organisation appears to be one which values its employees	CL	E	1	5
The culture within our organisation is one which supports change	CL	E	1	5
The culture within our organisation is one which supports acquisition of knowledge, learning and information	CL	E	1	5
The culture within our organisation is one which supports responding efficiently to changes in the competitive environment	CL	E	1	5

Part 3	Part 3 seeks to capture your views on characteristics of being agile and whether you would like to be involved in the next stage of the research
	Please complete both questions below. For the first question, if you do not know, or do not have strong views please leave this section blank. There is no right or wrong answers to the first question and your views and opinions are very welcome. Only complete the secon question is you would like to be involved in the second stage of the research process

What do you believe are the most important characteristics an organisation needs to master ro be regarded as 'agile' ? (list as many as you wish)				
After we have completed our analysis we may wish to speak to selected individuals in more depth about their views. If you would be willing to take part in this further research, please fill in your name, your organisation, your email address and telephone number	Name	Organisation	Email	Telephone

Thank you for taking the time to complete this survey, your views are very important to us

Appendix 4 - Copy of the follow-on interview script

Can you give examples of organisations you would regard as agile ? What makes them agile ?
What does an organisation have to master to be regarded as agile ?
What differences do you see in the need for agility across different businesses or industries ? Or even within the same organisation ?
How does agility differ from flexibility ?
Where do you feel agile capability differs from lean ?
What factors influence an organisation's capability to be agile ?
How do you think large organisations can become more agile to compete effectively with their smaller counterparts ?
Do you feel the need to be agile is more driven by demand-side factors or supply led ?

Appendix 5 - Copy of interview script for meeting with Head of Change and Transformation (Midland Heart)

What were the motivations behind MH becoming more agile ?
Did you or those involved have a clear vision of what agility meant ?
How did the reality of being an agile organisation compare to the perception ?
What did you think the journey to agility would involve ?
What did you think MH would be doing differently ?
What did you see as the primary barriers or obstacles ?
How significant have the barriers been in allowing progress ?
How well do you feel the organisation has progressed on the journey ?
Has it turned out as you expected ?
What do you feel MH should or would have done differently ?
Do you feel MH is truly committed to achieving agility ?
Overall how would you sum up the agile agenda in relation to MH ?
Do you think MH has lost some momentum on agility (why) ?
Where does MH go from here ? What do you think will happen ?

Appendix 6 – Tables and charts for data presentation (Chapter Four)

Correlations

			SpeedResponse	AssimilatingInfo
Spearman's rho	SpeedResponse	Correlation Coefficient	1.000	.370*
		Sig. (2-tailed)	.	.019
		N	40	40
	AssimilatingInfo	Correlation Coefficient	.370*	1.000
		Sig. (2-tailed)	.019	.
		N	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

Table 55 Correlation analysis (speed of response: assimilating information)

Correlations - Customer

			Solutions	Innovation	AssimilatingInfo	Customisation
Spearman's rho	Solutions	Correlation Coefficient	1.000	.399*	.155	.512**
		Sig. (2-tailed)	.	.011	.340	.001
		N	40	40	40	40
	Innovation	Correlation Coefficient	.399*	1.000	.233	.252
		Sig. (2-tailed)	.011	.	.148	.117
		N	40	40	40	40
	AssimilatingInfo	Correlation Coefficient	.155	.233	1.000	.063
		Sig. (2-tailed)	.340	.148	.	.698
		N	40	40	40	40
	Customisation	Correlation Coefficient	.512**	.252	.063	1.000
		Sig. (2-tailed)	.001	.117	.698	.
		N	40	40	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 56 Correlation (Spearman) analysis between the agility traits related to the customer element of agility

Correlations – Customer (Sector Differences)

Private or public				Solutions	Innovation	AssimilatingInfo	Customisation
Spearman's rho	1 Private	Solutions	Correlation Coefficient	1.000	.616**	.118	.458*
			Sig. (2-tailed)	.	.005	.631	.049
			N	19	19	19	19
		Innovation	Correlation Coefficient	.616**	1.000	.253	.371
			Sig. (2-tailed)	.005	.	.296	.118
			N	19	19	19	19
		AssimilatingInfo	Correlation Coefficient	.118	.253	1.000	.252
			Sig. (2-tailed)	.631	.296	.	.299
			N	19	19	19	19
		Customisation	Correlation Coefficient	.458*	.371	.252	1.000
			Sig. (2-tailed)	.049	.118	.299	.
			N	19	19	19	19
	2 Public	Solutions	Correlation Coefficient	1.000	.242	.136	.555**
			Sig. (2-tailed)	.	.291	.556	.009
			N	21	21	21	21
		Innovation	Correlation Coefficient	.242	1.000	.251	.140
			Sig. (2-tailed)	.291	.	.273	.546
			N	21	21	21	21
		AssimilatingInfo	Correlation Coefficient	.136	.251	1.000	-.072
			Sig. (2-tailed)	.556	.273	.	.755
			N	21	21	21	21
		Customisation	Correlation Coefficient	.555**	.140	-.072	1.000
			Sig. (2-tailed)	.009	.546	.755	.
			N	21	21	21	21

Table 57 Correlation (Spearman) analysis between the agility traits related to the customer element of agility split by private/ public sector

Correlations - Structure

			Configuration	Control	SpeedResponse	SupplyChain	ChangeMgt	AdaptiveStrategies
Spearman's rho	Configuration	Correlation Coefficient	1.000	.193	-.056	-.108	-.148	.149
		Sig. (2-tailed)	.	.234	.730	.509	.363	.365
		N	40	40	40	40	40	39
	Control	Correlation Coefficient	.193	1.000	.175	.016	-.013	.171
		Sig. (2-tailed)	.234	.	.280	.922	.934	.299
		N	40	40	40	40	40	39
	SpeedResponse	Correlation Coefficient	-.056	.175	1.000	.158	.304	.222
		Sig. (2-tailed)	.730	.280	.	.331	.056	.174
		N	40	40	40	40	40	39
	SupplyChain	Correlation Coefficient	-.108	.016	.158	1.000	.527**	.341*
		Sig. (2-tailed)	.509	.922	.331	.	.000	.034
		N	40	40	40	40	40	39
	ChangeMgt	Correlation Coefficient	-.148	-.013	.304	.527**	1.000	.355*
		Sig. (2-tailed)	.363	.934	.056	.000	.	.026
		N	40	40	40	40	40	39
	AdaptiveStrategies	Correlation Coefficient	.149	.171	.222	.341*	.355*	1.000
		Sig. (2-tailed)	.365	.299	.174	.034	.026	.
		N	39	39	39	39	39	39

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 58 Correlation (Spearman) analysis between the agility traits related to the structure element of agility

Correlations - Change

			ChangeMgt	AdaptiveStrategies	Unpredictability
Spearman's rho	ChangeMgt	Correlation Coefficient	1.000	.355*	.368*
		Sig. (2-tailed)	.	.026	.019
		N	40	39	40
	AdaptiveStrategies	Correlation Coefficient	.355*	1.000	.403*
		Sig. (2-tailed)	.026	.	.011
		N	39	39	39
	Unpredictability	Correlation Coefficient	.368*	.403*	1.000
		Sig. (2-tailed)	.019	.011	.
		N	40	39	40

*. Correlation is significant at the 0.05 level (2-tailed).

Table 59 Correlation (Spearman) analysis between the agility traits related to the three patterns of change

Correlations - Structure (Sector Differences)

Private or public				Configuration	Control	SpeedResponse	SupplyChain	ChangeMgt	AdaptiveStrategies
Spearman's rho	1 Private	Configuration	Correlation Coefficient	1.000	.208	-.204	.315	-.080	.075
			Sig. (2-tailed)	.	.394	.402	.189	.745	.768
			N	19	19	19	19	19	18
		Control	Correlation Coefficient	.208	1.000	.196	.246	.140	.261
			Sig. (2-tailed)	.394	.	.422	.310	.568	.296
			N	19	19	19	19	19	18
		SpeedResponse	Correlation Coefficient	-.204	.196	1.000	.217	.622**	.303
			Sig. (2-tailed)	.402	.422	.	.372	.004	.221
			N	19	19	19	19	19	18
		SupplyChain	Correlation Coefficient	.315	.246	.217	1.000	.052	.307
			Sig. (2-tailed)	.189	.310	.372	.	.833	.215
			N	19	19	19	19	19	18
		ChangeMgt	Correlation Coefficient	-.080	.140	.622**	.052	1.000	.406
			Sig. (2-tailed)	.745	.568	.004	.833	.	.095
			N	19	19	19	19	19	18
		AdaptiveStrategies	Correlation Coefficient	.075	.261	.303	.307	.406	1.000
			Sig. (2-tailed)	.768	.296	.221	.215	.095	.
			N	18	18	18	18	18	18
	2 Public	Configuration	Correlation Coefficient	1.000	.092	.112	-.395	-.169	.218
			Sig. (2-tailed)	.	.693	.628	.077	.464	.342
			N	21	21	21	21	21	21
		Control	Correlation Coefficient	.092	1.000	.194	-.083	-.034	.125
			Sig. (2-tailed)	.693	.	.399	.720	.885	.589
			N	21	21	21	21	21	21
		SpeedResponse	Correlation Coefficient	.112	.194	1.000	.013	.087	.175
			Sig. (2-tailed)	.628	.399	.	.956	.708	.449
			N	21	21	21	21	21	21
		SupplyChain	Correlation Coefficient	-.395	-.083	.013	1.000	.767**	.337
			Sig. (2-tailed)	.077	.720	.956	.	.000	.135
			N	21	21	21	21	21	21
		ChangeMgt	Correlation Coefficient	-.169	-.034	.087	.767**	1.000	.353
			Sig. (2-tailed)	.464	.885	.708	.000	.	.116
			N	21	21	21	21	21	21
		AdaptiveStrategies	Correlation Coefficient	.218	.125	.175	.337	.353	1.000

	Sig. (2-tailed)	.342	.589	.449	.135	.116	.
	N	21	21	21	21	21	21

**. Correlation is significant at the 0.01 level (2-tailed).

Table 60 Correlation (Spearman) analysis between the agility traits related to the structure element of agility split by private/ public sector

			ChangeMgt	AdaptiveStrategies	Motivating
Spearman's rho	ChangeMgt	Correlation Coefficient	1.000	.355*	.377*
		Sig. (2-tailed)	.	.026	.017
		N	40	39	40
	AdaptiveStrategies	Correlation Coefficient	.355*	1.000	.411**
		Sig. (2-tailed)	.026	.	.009
		N	39	39	39
	Motivating	Correlation Coefficient	.377*	.411**	1.000
		Sig. (2-tailed)	.017	.009	.
		N	40	39	40

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 61 Correlation (Spearman) analysis between the agility traits related to two change patterns and motivation

Private or public				ChangeMgt	AdaptiveStrategies	Motivating
Spearman's rho	1 Private	ChangeMgt	Correlation Coefficient	1.000	.406	.253
			Sig. (2-tailed)	.	.095	.295
			N	19	18	19
		AdaptiveStrategies	Correlation Coefficient	.406	1.000	.233
			Sig. (2-tailed)	.095	.	.351
			N	18	18	18
		Motivating	Correlation Coefficient	.253	.233	1.000
			Sig. (2-tailed)	.295	.351	.
			N	19	18	19
	2 Public	ChangeMgt	Correlation Coefficient	1.000	.353	.377
			Sig. (2-tailed)	.	.116	.092
			N	21	21	21
		AdaptiveStrategies	Correlation Coefficient	.353	1.000	.539*
			Sig. (2-tailed)	.116	.	.012
			N	21	21	21
		Motivating	Correlation Coefficient	.377	.539*	1.000
			Sig. (2-tailed)	.092	.012	.
			N	21	21	21

*. Correlation is significant at the 0.05 level (2-tailed).

Table 62 Correlation (Spearman) analysis between change patterns and motivation split by private/ public sector

Correlations – Co-operation

			AlliancesPartners	DistinctiveCapability	EvalEnvironment	Unpredictability
Spearman's rho	AlliancesPartners	Correlation Coefficient	1.000	.285	.365*	.277
		Sig. (2-tailed)	.	.079	.022	.088
		N	39	39	39	39
	DistinctiveCapability	Correlation Coefficient	.285	1.000	.178	.471**
		Sig. (2-tailed)	.079	.	.273	.002
		N	39	40	40	40
	EvalEnvironment	Correlation Coefficient	.365*	.178	1.000	.488**
		Sig. (2-tailed)	.022	.273	.	.001
		N	39	40	40	40
	Unpredictability	Correlation Coefficient	.277	.471**	.488**	1.000
		Sig. (2-tailed)	.088	.002	.001	.
		N	39	40	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 63 Correlation (Spearman) analysis between the agility traits related to the co-operation element of agility

Correlations – Co-operation (Sector Differences)

Private or public				AlliancesPartners	DistinctiveCapability	EvalEnvironment	Unpredictability
Spearman's rho	1 Private	AlliancesPartners	Correlation Coefficient	1.000	.724**	.515*	.356
			Sig. (2-tailed)	.	.001	.029	.147
			N	18	18	18	18
		DistinctiveCapability	Correlation Coefficient	.724**	1.000	.298	.236
			Sig. (2-tailed)	.001	.	.214	.331
			N	18	19	19	19
		EvalEnvironment	Correlation Coefficient	.515*	.298	1.000	.742**
			Sig. (2-tailed)	.029	.214	.	.000
			N	18	19	19	19
		Unpredictability	Correlation Coefficient	.356	.236	.742**	1.000
			Sig. (2-tailed)	.147	.331	.000	.
			N	18	19	19	19
	2 Public	AlliancesPartners	Correlation Coefficient	1.000	.041	.267	.270
			Sig. (2-tailed)	.	.860	.242	.236
			N	21	21	21	21
		DistinctiveCapability	Correlation Coefficient	.041	1.000	.159	.644**
			Sig. (2-tailed)	.860	.	.490	.002
			N	21	21	21	21
		EvalEnvironment	Correlation Coefficient	.267	.159	1.000	.318
			Sig. (2-tailed)	.242	.490	.	.160
			N	21	21	21	21
		Unpredictability	Correlation Coefficient	.270	.644**	.318	1.000
			Sig. (2-tailed)	.236	.002	.160	.
			N	21	21	21	21

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 64 Correlation (Spearman) analysis between the agility traits related to the co-operation element of agility split by private/ public sector

Correlations – People

			EnablingEmployees	Motivating	NuturingComp	ExploitingInfo	Culture
Spearman's rho	EnablingEmployees	Correlation Coefficient	1.000	.663**	.208	.377*	.059
		Sig. (2-tailed)	.	.000	.210	.021	.725
		N	38	38	38	37	38
	Motivating	Correlation Coefficient	.663**	1.000	.507**	.466**	.250
		Sig. (2-tailed)	.000	.	.001	.003	.119
		N	38	40	40	39	40
	NuturingComp	Correlation Coefficient	.208	.507**	1.000	.382*	.149
		Sig. (2-tailed)	.210	.001	.	.016	.358
		N	38	40	40	39	40
	ExploitingInfo	Correlation Coefficient	.377*	.466**	.382*	1.000	.224
		Sig. (2-tailed)	.021	.003	.016	.	.171
		N	37	39	39	39	39
	Culture	Correlation Coefficient	.059	.250	.149	.224	1.000
		Sig. (2-tailed)	.725	.119	.358	.171	.
		N	38	40	40	39	40

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 65 Correlation (Spearman) analysis between the agility traits related to the people element of agility

Correlations - People (Sector Differences)

Private or public				EnablingEmployees	Motivating	NuturingComp	ExploitingInfo	Culture
Spearman's rho	1 Private	EnablingEmployees	Correlation Coefficient	1.000	.596**	.080	.708**	.033
			Sig. (2-tailed)	.	.009	.753	.001	.896
			N	18	18	18	18	18
		Motivating	Correlation Coefficient	.596**	1.000	.383	.575**	.093
			Sig. (2-tailed)	.009	.	.106	.010	.704
			N	18	19	19	19	19
		NuturingComp	Correlation Coefficient	.080	.383	1.000	.432	.270
			Sig. (2-tailed)	.753	.106	.	.065	.264
			N	18	19	19	19	19
		ExploitingInfo	Correlation Coefficient	.708**	.575**	.432	1.000	-.122
			Sig. (2-tailed)	.001	.010	.065	.	.618
			N	18	19	19	19	19
		Culture	Correlation Coefficient	.033	.093	.270	-.122	1.000
			Sig. (2-tailed)	.896	.704	.264	.618	.
			N	18	19	19	19	19
	2 Public	EnablingEmployees	Correlation Coefficient	1.000	.681**	.254	.097	.085
			Sig. (2-tailed)	.	.001	.279	.692	.722
			N	20	20	20	19	20
		Motivating	Correlation Coefficient	.681**	1.000	.617**	.391	.431
			Sig. (2-tailed)	.001	.	.003	.088	.051
			N	20	21	21	20	21
		NuturingComp	Correlation Coefficient	.254	.617**	1.000	.399	.168
			Sig. (2-tailed)	.279	.003	.	.081	.466
			N	20	21	21	20	21
		ExploitingInfo	Correlation Coefficient	.097	.391	.399	1.000	.520*
			Sig. (2-tailed)	.692	.088	.081	.	.019
			N	19	20	20	20	20

	Culture	Correlation Coefficient	.085	.431	.168	.520*	1.000
		Sig. (2-tailed)	.722	.051	.466	.019	.
		N	20	21	21	20	21

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 66 Correlation (Spearman) analysis between the agility traits related to the people element of agility split by private/ public sector

Correlations

			NuturingComp	Innovation
Spearman's rho	NuturingComp	Correlation Coefficient	1.000	.389*
		Sig. (2-tailed)	.	.013
		N	40	40
	Innovation	Correlation Coefficient	.389*	1.000
		Sig. (2-tailed)	.013	.
		N	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

Table 67 Correlation (Spearman) analysis between nurturing competencies and innovation

Correlations

			Motivating	Unpredictability	ChangeMgt	AdaptiveStrategies
Spearman's rho	Motivating	Correlation Coefficient	1.000	.375*	.377*	.411**
		Sig. (2-tailed)	.	.017	.017	.009
		N	40	40	40	39
	Unpredictability	Correlation Coefficient	.375*	1.000	.368*	.403*
		Sig. (2-tailed)	.017	.	.019	.011
		N	40	40	40	39
	ChangeMgt	Correlation Coefficient	.377*	.368*	1.000	.355*
		Sig. (2-tailed)	.017	.019	.	.026
		N	40	40	40	39
	AdaptiveStrategies	Correlation Coefficient	.411**	.403*	.355*	1.000
		Sig. (2-tailed)	.009	.011	.026	.
		N	39	39	39	39

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 68 Correlation (Spearman) analysis between three distinct change patterns and motivating employees

Appendix 7 – Tables and commentary for importance of agility characteristics (Chapter Four)

Customer

The need for organisations to provide solutions to customers was one of the foremost determinants for firms to be regarded as agile, according to Goldman et al (1985). In terms of survey responses, there were no 'don't know' responses indicating an element of conviction in views but looking at the importance weighting reveals some disparity. Of 40 respondents to the question, 82% of respondents assessed the importance level as greater than 5, indicating a positive skew to the importance attached to this facet of agility. Moreover 50% of respondents across all hierarchical layers assessed Solutions as 9 or 10 thereby attaching a high level of importance. These measures however mask a significant perception difference at each managerial level with opinion highly divided at Board level where 40% of board respondents rated Solutions as highly important (score of 9 or 10) but a symmetrical view existed with 40% suggesting low importance (score of 1 or 2). There was a stronger conviction within the senior manager population with 60% attaching high importance to delivering solutions rather than products. Within middle managers, there was low conviction with 36% regarding this as high importance but a relatively long 'tail' of scores with a range from 3 to 10 but a further 36% assessing this as below neutral in terms of importance. This contrasts with non-managers, who tended to show high correlation with middle managers in several of the scores (see later), where 57% of non-managerial respondents attached high importance, with all scoring greater than neutral.

Solutions not products/ services					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1	1	1			
2	1	1			
3	1			1	
4	2		1	1	
5	2			2	
6	1				1
7	5			2	3
8	7	1	3	1	2
9	8	1	3	1	3
10	12	1	3	3	5
Don't Know					

Table 69 Response patterns by management level (solutions)

On the issue of Innovation and Design there was a range of responses from 3 to 10, but surprisingly taking all responses, only 22.5% attached high importance to this facet of agility, appearing to contradict the views of Dove (2001) but supporting the caution around innovation articulated by Kay (1993). At Board level, views on innovation were widely dispersed with responses ranging from 3 to 10, mirroring the wider population but with only 40% regarding innovation as highly important to achieving agility. Views were more positively skewed at senior manager level with 50% suggesting this was of high importance and a tighter range of scores of 7 to 10. At lower levels of the organisation, innovation appeared to carry much less significance, with only 9% of middle managers and 7% of non-managers regarding this is highly important with most (92%) response scores in the 4 to 8 range within these two management layers.

Innovation and design					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3	1	1			
4	3			1	2
5	3			1	2
6	2			1	1
7	8	1	1	2	4
8	14	1	4	5	4
9	2	1	1		
10	7	1	4	1	1
Don't Know					

Table 70 Response patterns by management level (innovation)

A very significant 97% of all respondents attached an importance level of greater than neutral to achieving first-mover status, compared to 82% for innovation, with 32.5% affording this high importance, 10% higher than innovation. In contrast to innovation, the importance scores increased rather than reduced as responses descended through the hierarchy with only 20% of board appointees rating first mover as highly important, but increasing in significance to 30% for senior managers and 36% for middle and non-managers, again showing commonality in response patterns. Significantly however non-managers tended to attach the highest importance score to first-mover, with 36% selecting a score of 10, differing from middle managers, none of whom attached a 10

rating, though 36% selected 9. Consistent with innovation, there was an absence of 'don't know' responses, indicating high conviction.

First mover					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2	1				
3					
4					
5					
6	2			1	1
7	12	1	3	4	4
8	9	2	3	1	3
9	5		1	4	
10	8	1	2		5
Don't Know					

Table 71 Response patterns by management level (first mover)

Firms displaying hallmarks of agility are contingent on the ability to gather current or real-time information which was seen as a significant influence on agile capability, notwithstanding that 5% of participants selected a 'don't know' response. Excluding the 'don't know' responses, 97.4% of the total participants suggested use of up-to-date information was more important than neutral, with 74% attaching high importance to this. Eisenhardt (1989) drew a clear linkage between the use of real-time information and the ability to effect decisions rapidly. Survey participants were asked about the use of up-to-date information in relation to agile organisations with 50% of those affording this the highest score of ten, and only 2.5% assessing this as below median in terms of importance and this would appear to support the views of Eisenhardt. This also demonstrates that the importance of rapid response time in the agile organisation is contingent upon use of real-time information and was confirmed by a medium strength correlation of 0.37 between assimilating information and speed of response.

There were marked differences across management strata around the importance of information, with 100% of board level respondents affording this a score of 9 or 10. There was commonality in response at board level between use of information and reviewing and responding to changes in the external environment, both of which carried significant importance amongst this population but the level of importance for making use of information diminishes at less senior levels, reducing to 90% at senior manager

level, 55% at middle manager and 57% for non-managerial, although this increases to 67% if 'don't know' responses are excluded.

Use of up-to-date information					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4					
5	1				1
6	1				1
7	2			1	1
8	6		1	4	1
9	8	1	3	1	3
10	20	4	6	5	5
Don't Know	2				2

Table 72 Response patterns by management level (assimilating information)

The issue of response time appeared to be consistent across all organisations as being important with each registering an importance score of 6% in contrast to mass-customisation, which was still regarded as being an enabler for the agile organisation but assuming less importance at 4%. Although there was clarity in expressing a view, with no 'don't know' responses recorded, only 67.5% registered a view more positive than neutral and just 22.5% attached high importance to this facet of agility.

Significantly no board level participants afforded the ability to mass-customise high importance with 80% of that population selecting scores of between 5 and 7. Dispersion of scores was more evident amongst senior managers with 50% attaching a neutral to low importance rating (1 to 5) but a polarity emerged to the extent that 30% viewed this is as highly important. The capability to mass-customise was seen as more important at junior levels with 36% of both middle managers and non-managers regarding this as highly important, thus continuing the propensity for these two groups to hold similar views, though within the non-managers, 36% also regarded this as unimportant whereas this was less than 10% for middle managers.

Mass Customisation					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1	3		1	1	1
2					
3	1	1			
4	2				2
5	7	1	4		2
6	4	1	2	1	
7	7	2		3	2
8	4			2	2
9	3		1	2	
10	9		2	2	5
Don't Know					

Table 73 Response patterns by management level (mass customisation)

Structure

When viewed across all six organisations, structure appeared to be the most significant of the four primary factors in determining an agile organisation yet none of the six organisations returned an achievement score which exceeded the importance weighting. Within 'structure' there was also evidence of disparity to the extent that the ability to manage disruptive change was seen as highly relevant, reinforcing the views of McCann (2004) and McCann et al (2009). The surprising issue was that configuration and control/ hierarchy were seen as less important with four of the six organisations affording this the lowest importance rating of 4%, although there was a higher degree of 'don't know' responses to these structural elements, and specifically in the case of whether agility is defined by configuration, 12.5% of participants selected this response option. This directly contradicts the views of Goldman et al (1995) who explicitly point to the need for delayering as an enabler for agility, although Eisenhardt et al (2000) suggest hierarchy and control is legitimate in stable environments. This could imply that all six participating organisations viewed their operating environment as stable but this was only evident from the interviews in the case of one organisation (Cape Hill Medical) where the rate of environmental change is pedestrian and 'signalled' in advance by central Government.

When considering the significance organisational structure has on agility, the outcomes from the quantitative part of the study tended to contradict the views of Goldman et al (1995) in terms of importance. The most notable issue was that when considering the extent to which the way the organisation is configured impacts on agile capability,

12.5% of participants selected a ‘don’t know’ response, the highest for any of the agility trait questions. Whilst the way in which the organisation is configured generally had a negative skew, with 82% of respondents (exc. don’t knows) rating this above neutral, only 14% regarded this has carrying a high importance level. Only 20% of board level management rated configuration as high in importance with middle managers registering the most substantial score here at 37.5%, although this population also displayed the greatest tendency to select ‘don’t know’ at 27%. Most respondents (74%) selected a response score of between 5 and 8 suggesting that configuration carries importance but is substantially subordinated to the likes of using up-to-date information.

Configuration					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1	2		2		
2	2	1			1
3					
4					
5	2	1			1
6	6	1	1	2	2
7	11	1	5	2	3
8	7		2	1	4
9	2			2	
10	3	1		1	1
Don’t Know	5			3	2

Table 74 Response patterns by management level (configuration)

The proportion of participants suggesting control and hierarchy has an importance rating of greater than neutral was similar to configuration at 76%, although there was greater dispersion of response with all possible scores being selected. 5% of all participants opted for a ‘don’t know’ response, lower than for configuration but excluding these gave rise to 26% of respondents rating hierarchy and control as having high importance. Fully 15% of responses suggested hierarchy has a less than neutral importance which was a more significant negative response than for configuration. This proved to be a topic of vexation within the interviews as we shall see later and in chapter 5.

Hierarchy and control					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1	1		1		
2	1	1			
3	1				1
4	3		1	2	
5	3				3
6	5	1	2	2	
7	8	2	2	2	2
8	6	1	1	2	2
9	8		3	2	3
10	2				2
Don't Know	2			1	1

Table 75 Response patterns by management level (hierarchy and control)

One of the most significant influencers in relation to agility which emerged from the survey was speed of response which supports the views of Hormozi (2001) and Guillen and Garcia-Canal (2010).The survey highlighted a tight range of importance scores from 7 to 10, all registering above neutral, with an absence of 'don't know' responses indicating a high level of conviction. Although across all management layers, 77% rated speed of response as highly important, at board level this was 100%. This percentage diminished in importance at lower levels, with 80% of senior managers, and 72% of middle managers affording this a score of 9 or 10. In common with innovation, use of information and mass customisation, middle and non-managers shared very similar views with 71% of non-managers attaching high importance to this.

Speed of response					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4					
5					
6					
7	3			2	1
8	6		2	1	3
9	12	1	4	3	4
10	19	4	4	5	6
Don't Know					

Table 76 Response patterns by management level (speed of response)

The survey highlighted the importance of supply chain management to the agile organisation, supporting the views of Christopher (2002) and Christopher et al (2004) and fully consistent with the findings of the CIPD (2011). 92% of respondents assessed supply chain management as carrying more than a neutral importance, with 47.5% affording this a high importance weighting. Once again an absence of 'don't know' responses added to strength of feeling but this deviated markedly across different managerial layers, with the highest importance attached at board level at 60%. This dropped dramatically to 40% at senior manager level, spiking up to 54% for middle managers and 43% for non-managers. A closer look at the senior manager population however reveals that 50% selected an importance score of 8, so redrawing the boundaries for high importance to between 8 and 10, reveals a 90% importance score amongst, senior managers, declining to 73% for middle managers and 64% for non-managers.

Supply chain					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4	1			1	
5	2				2
6	2		1		1
7	6	2		2	2
8	10		5	2	3
9	6	1	1	2	2
10	13	2	3	4	4
Don't Know					

Table 77 Response patterns by management level (supply chain)

The survey sought to test agility in relation to varying degrees of change in the environment – progressive or gradual change, disruptive but infrequent and unpredictable. The responses displayed similarities when respondents were asked about the importance of being adept at handling disruptive and progressive change. In both cases the importance level registering above neutral was 100%, with a complete absence of 'don't know' responses, indicating clarity of view. The proportion of participants indicating high importance attached to the ability to master disruptive change was higher at 55% compared to 50% for adaptive strategies which facilitate the more progressive nature of change.

Change Management (disruptive)					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4					
5					
6	1			1	
7	6			3	3
8	11	1	3	2	5
9	12	2	5	2	3
10	10	2	2	3	3
Don't Know					

Table 78 Response patterns by management level (change management)

Adaptive Strategies (progressive)					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4					
5					
6	4		1		3
7	5	1	2	1	1
8	10	1	2	3	4
9	8	1	3		4
10	12	2	1	7	2
Don't Know					

Table 79 Response patterns by management level (adaptive strategies)

Importance levels varied across managerial levels with a higher importance attached to disruptive change across all managerial grades but evidence of ambivalence amongst non-managers, with 43% of this group suggesting the ability to manage disruptive and progressive change patterns were equally important. When viewing disruptive change, the common theme of middle and non-managers sharing similar views emerged but the response patterns from middle managers to the issue of progressive change appeared anomalous with 64% of this group attaching an importance weighting of 10.

Co-operation

The survey aimed to test the extent to which agile organisations were able to perform tasks which competitors might find it difficult to imitate, fully reflecting the notion of causal ambiguity. Here opinion was divided with responses spread across the full range of possible scores from 1 to 10, plus 5% expressing a 'don't know' view, though these were confined to the lower levels of the hierarchy. In common with structure, there was a wider range of importance scores across the individual component traits with distinctive capability generally seen as less important (4% weighting) and external environment the most significant (6% weighting).

Across all managerial layers, 92% of respondents rated the importance as greater than neutral but only 26% indicating a high level of importance, this being reflective of the board level and senior manager populations at 20% and 30% respectively, although no board members rated the importance as 10, but once again the stand-out group was middle managers where 46% suggested using alliances was highly important to agility. This issue highlighted the largest deviation between the response scores of middle and non-managers since within the latter group, only 7% attached high importance to this. This can be explained by the perceived upheaval from line-staff following mergers or the forming of alliances.

Alliances and partnerships					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4					
5	3		1	1	1
6	3				3
7	10	3	3	1	3
8	13	1	3	4	5
9	5	1	2	2	
10	5		1	3	1
Don't Know					

Table 80 Response patterns by management level (alliances and partnerships)

Recognising that a firm has distinctive capability(s) was regarded as important since 75% of responses scored this as greater than neutral importance but the proportion rating this as high importance was low – 20% at board level, 30% at senior manager

level, only 9% at middle manager and 21% at non-manager, the latter two adjusted for 'don't know' responses. There was a strong neutral to positive bias with 68% of responses rating the importance level as 5 to 8.

Distinctive capability					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1	1			1	
2	1		1		
3					
4	2			1	1
5	6	1	1	1	3
6	4	1	1		2
7	8	1	2	3	2
8	8	1	2	3	2
9	6	1	2		3
10	2		1	1	
Don't Know	2			1	1

Table 81 Response patterns by management level (distinctive capability)

At board level 60% of respondents rated evaluating the environment as highly important, although the remaining 40% afforded this a score of 8, which is still significant. Senior and middle managers rating reading the external environment as high importance rose to 70% and 73% respectively before reducing to 57% for non-managers. Interestingly non-managers returned the same importance score for use of information at 57% whereas at senior manager level, 90% regarded information as highly important, compared to only 70% of the same population in relation to the external environment.

External environment					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4					
5					
6	2		1		1
7	4		1	1	2
8	8	2	1	2	3
9	9		3	3	3
10	17	3	4	5	5
Don't Know					

Table 82 Response patterns by management level (external environment)

There was a narrow range of high importance scores across management layers for dealing with unpredictability, with board level at 60% the highest, declining to 43% for non-managers. The range of importance scores increased also with decreased seniority with board appointees in a tight range of 7 to 10 but non-managers 5 to 10. Non-managers also rated the need to handle disruptive change as no more, or less important than for disruptive of progressive change. Whilst 95% of respondents placed dealing with unpredictability as having an importance weighting greater than neutral, only 47% placed this as high importance, less than the importance attached to both disruptive and progressive change.

Dealing with unpredictability					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4					
5	2				2
6	2		1	1	
7	8	1		3	4
8	9	1	4	2	2
9	11	2	3	2	4
10	8	1	2	3	2
Don't Know					

Table 83 Response patterns by management level (dealing with unpredictability)

Even when interviewees were presented with a choice of the three distinct change patterns within this study, the response tended to favour disruptive rather than unpredictable change, which supported the survey responses. A comparison of the high importance scores (9 and 10) related to various degrees of change patterns are summarised below:

Change type	Total respondents %	Board %	Senior %	Middle %	Non %
Disruptive	55	80	70	45	43
Progressive	50	60	40	64	43
Unpredictable	47	60	50	45	43

Table 84 Response patterns by management level (three change patterns)

People

Enabling employees generally assumed a high importance level with 92% of participants affording this a score of greater than neutral and 70% regarding this worthy of a 9 or 10 score. The range of response scores increased as seniority levels declined with board level responses clustered around the higher importance level of 8, 9 and 10 but non-managers using a more fulsome range of importance scores from 3 to 10. This translated into high importance scores ranging from 60% at board level, 73% for middle managers and 64% for non-managers.

Enabling employees					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3	1				1
4					
5	2			1	1
6	1			1	
7	2		1		1
8	5	2	1	1	1
9	12	2	3	4	3
10	14	1	5	4	4
Don't Know	1				1

Table 85 Response patterns by management level (enabling employees)

Inextricably linked to enabling employees is motivating them and consistent with the response pattern from enabling, 95% highlighted an importance level higher than neutral. However a more modest proportion attached high importance to motivating employees at just 45%, although there appears to be clarity of response, with no 'don't know' outcomes. The responses for high importance were consistent across all three management layers at 60% for board appointees and senior managers, declining only marginally to 55% for middle managers. The surprising outcome was that only 21% of non-managers afforded this high importance, with this group offering a broader range of scores (from 3 to 10).

Motivating employees					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3	1				1
4					
5	1	1			
6	3				3
7	7		1	3	3
8	10	1	3	2	4
9	7	2	2	2	1
10	11	1	4	4	2
Don't Know					

Table 86 Response patterns by management level (motivating employees)

The ability to nurture skills and competencies provoked a generally positive response pattern with 95% of all participants suggesting this had an importance level of greater than neutral and 50% affording this a high importance weighting. There was evidence however of marked differences in importance when considered at various managerial levels with 60% of board level respondents suggesting this was of high importance, a level mirrored at middle manager level (64%) but a lower rating of 50% for senior managers and only 36% for non-managerial staff.

Nurturing competencies					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4	1				1
5					
6	2				2
7	7		3	1	3
8	10	2	2	3	3
9	8	1	2	3	2
10	12	2	3	4	3
Don't Know					

Table 87 Response patterns by management level (nurturing competencies)

The importance of exploiting information was reflected in the survey responses, with 97% of participants attaching an importance rating of greater than neutral although once again this masked diverse responses from management strata. 49% of all participants rated exploiting information as high importance, though this differed from the significance of assimilating information. At board level, respondents fully recognised the significance of exploiting information, with 80% of respondents attaching high importance, though this declined to 60% and 55% for senior and middle managers. Non-managers did not share the same view with only 23% of this population affording it high importance.

Exploiting information					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3					
4					
5	1				1
6					
7	7		1	2	4
8	11	1	3	2	5
9	8	1	2	3	2
10	11	3	4	3	1
Don't Know	1			1	

Table 88 Response patterns by management level (exploiting information)

From the survey responses, the extent to which the agile organisation is shaped by pervading culture appears significant with 95% of all respondents affording this an importance score greater than neutral, although the percentage rating this as highly important is less marked at 58%. 7.5% of participants recorded a 'don't know' response which was the second-highest for any of the agility traits indicating a degree of uncertainty as to its influence, though these were manifest at lower levels of the management structure (middle and non-managers).

Trompenaars and Hampden-Turner (1997) link hierarchy to the culture pervading the organisation and here the participating organisations had a very clear notion that agility is informed by organisational culture with 47.5% of responses rating culture as high importance (score of 10), thus supporting the views of Bolden (2011) but this may equally be explained by the individualist culture evident in the US and Western Europe which is conducive to agile behaviours (Trompenaars and Hampden-Turner 1997). Despite this strong sense that culture influences agility, there was also a relatively significant level of 'don't know' responses at 7.5%. Culture did not emerge as a prevalent issue in the interviews except for one board level employee who referred to small firms as having a 'built in advantage' on agility when compared to larger firms and this could be remedied by senior managers becoming more 'connected' with the needs of customers, reinforcing the view of Trompenaars and Hampden-Turner (*ibid*) that culture is influenced, in part, by the hierarchical arrangement which defines authority. When considering firms in this study, WCC, MH and Halifax tended to mirror the 'eiffel tower' culture posited by the authors. Certainly one non-manager from WCC highlighted this very point by suggesting top-management were simply too far removed from the end user of services. The culture issue raised an interesting parallel with innovation, since innovation featured strongly in the interviews as a determinant for the agile organisation, but it appears agile firms develop a culture of innovation, supporting the views of Kay (1993) that innovation per se is not a passport to competitive advantage. This suggests, agile firms at least need to demonstrate characteristics of the 'incubator' culture (Trompenaars and Hampden-Turner 1997) which was more evident at CDC and IPScape, although correlation analysis (rho = 0.15) suggested a weak relationship.

Culture					
	Number of Respondents by Managerial Level				
Importance Score	**Total Respondents**	**Board**	**Senior Managers**	**Middle Managers**	**Non-Managers**
1					
2					
3	1				1
4					
5	1				1
6					
7	4		2	2	
8	8	1	3	1	3
9	4	1		1	2
10	19	3	5	6	5
Don't Know	3			1	2

Table 89 Response patterns by management level (culture)

Board appointees felt culture carried greater significance in the agile organisation with 80% affording this a high importance weighting, falling to 50% for senior managers and non-managers, with the middle manager population once again proving to be slightly anomalous since 70% (exc. 'don't knows') regarded this as highly important.