

# Business process change: A guide for implementers

Vahid Javidroozi, Hanifa Shah, Ardavan Amini, Gerald Feldman

Computing, Engineering, the Built Environment (CEBE) Faculty, Birmingham City University (BCU),  
Birmingham, West Midlands, UK

**Abstract** – *Systems integration has become a need for enterprises, in order to deal with competitive business environment. Business Process Change (BPC) is known as the most imperative challenge for systems integration. Currently, a number of BPC methodologies have been developed by researchers and experts, but none of them comprises “identification of BPC type” as a significant stage for BPC. This research attempts to integrate this stage with others and activities of BPC and develop a BPC steps model, in order to specify them in various changing levels.*

**Keywords:** Business process change, Process change stages, Enterprise systems, Systems integration, BPC guide, BPC model

## 1 Introduction

Today's business environment is extremely changeable, unpredictable, and competitive. In this business environment, access to real-time data is necessary, in order to make on time decisions. Since 1940s systems integration has become the most important and useful change within the organization to provide cheaper, quicker, and high quality services [1]. Systems integration is a common term in enterprises, and it has been a crucial goal for them to improve their performance by sharing data, accessing real-time information, making decisions on-time, and perform their business processes efficiently and effectively.

As explained by [2], in a successful systems integration, it is critical to change its key drivers, which are process, people, technology, and flow of information amongst them. They have also introduced Business Processes as the main area of activities for systems integration.

In general, business processes are some systematic rules for addressing business issues [3]. Business processes are specific ways to perform business operations according to the organizational rules and policies [4]. Business processes connect input to output of an organization. People, management, roles, tasks, information flow, and technology add value to the inputs and generate some outputs such as products and services to the customers. In other words, all of these pieces try to create business processes to carry out the organizational operations [5]. In this research, business process is also defined as all enterprise's inter-related activities enabled by technology and performed by people, in order to fulfil business operations through enterprise's departments. Thus, Business Process Change (BPC) would be the most imperative and challenging task for enterprises to improve their business processes to highest level of performance. In other words, BPC is an enhancement

procedure, which can develop the business processes revolutionary (such as BPR) or evolutionary (such as TQM).

The role of BPC in other contexts, such as smart city development, which necessitate systems integration, is also significant [6]. Therefore, discussions about the guidelines, approaches, and stages of BPC are always popular for systems integration researchers and BPC implementers. In addition, identification of BPC type has not been emphasized as a step in previous BPC guidelines.

The aim of this research is to provide a comprehensive step-by-step guide for BPC implementers, by considering all aspects of BPC, including different approaches and levels. The objectives are also as follows:

- Explore the literature regarding BPC stages, types, and levels
- Summarizing and making relationships among various sets of BPC steps
- Developing a BPC steps model

The next section of this research reviews the literature regarding BPC stages. They are compared, conceptualized, and summarized in this section. Section 3 continues the critical analysis and provides an innovative set of BPC steps for systems integration. Then, each step will be discussed in detail. Finally, a BPC steps model is developed.

## 2 Existing BPC methodologies

Many researchers have suggested some stages for business process redesign, improvement, transformation, innovation, Business Process Reengineering (BPR), BPC, etc. for example, Davenport [7] identified five steps framework for business process innovation as follows:

- 1) Identifying process for innovation
- 2) Identifying change levers
- 3) Developing process visions
- 4) Understanding existing processes
- 5) Designing and prototyping the new process

Then, they extend them to 10 steps, according to activities of each step.

Another five-step has been suggested by Harmon [8] for business process redesign, which are planning, analyzing existing processes, design new processes, resource development for new processes, and management for

transition to new processes. Moreover, reference [9] defined six steps for business process change especially by BPR technique. Those six steps are envision, initiation, Diagnosis, redesigning, reconstruction, and evaluation (S-A methodology). This methodology has been cited, argued, and critically analyzed by many researchers such as [10]–[13]. Some of them have followed S-A methodology in their research, some have added other aspects, and some have suggested different methodologies. For example, in addition to S-A methodology, Al-mashari and Zairi [12] has analyzed and compared eight more major sets of steps for BPR. Then, they identified 10 principles that should exist in BPR steps. Those principles are set strategies and goals, feasibility analysis, top management support, understanding customers' needs and performance measurement, integration with TQM, IT capabilities, communication between team members, process mapping and prototyping, changing management for whole organization. Furthermore, reference [10] argued that S-A methodology does not specifically identify BPR steps from organizational view. Thus, they provided another set of steps for BPR as follows:

- 1) Setup the vision, objectives, scope, and mode of BPR
- 2) Modeling
- 3) Analysis
- 4) Redesign
- 5) Continuous improvement

As characterized by previous researchers, despite the differences in terminology, all methodologies emphasize similar aspects and follow the same rules. For instance, analyzing and understanding existing business processes is one of the imperative steps that is described by all methodologies. In addition, according to complexity theory, Rhydderch [14] pointed out that “efforts to change practice should be preceded by efforts to understand it”. Summarizing all explained methodologies introduces following steps for the purpose of this research (Table 1). The first two steps answer to this question: “Why change is required?”

Table 1: A summary of popular BPC methodologies

Steps	Activities	study
1. Understanding project objectives (e.g. systems integration in this research)	<ul style="list-style-type: none"> <li>- Identifying project vision and objectives in business</li> <li>- Identifying processes that support the project objectives as well as their performance target</li> <li>- Formulate process performance objectives</li> </ul>	[7], [10], [15]
2. Understanding existing business processes	<ul style="list-style-type: none"> <li>- Understanding and documenting current process flow and directions</li> <li>- Measure and assess the processes against new process objectives and attributes</li> <li>- Identify issues in current processes</li> </ul>	[7]–[10], [12], [15]
3. Identifying processes for change	<ul style="list-style-type: none"> <li>- Evaluating the role, culture, and politics of each process</li> <li>- Identifying process bundries</li> </ul>	[7], [9], [10]
4. Preparation for the change	<ul style="list-style-type: none"> <li>- Identifying change enablers such as technological and human resources</li> <li>- Defining scope</li> <li>- Setting the strategies and goals</li> <li>- Planning and scheduling</li> <li>- Establishing management commitment</li> <li>- Inform stakeholders</li> <li>- Organising change team</li> </ul>	[7]–[9], [12]
5. Designing & Prototyping	<ul style="list-style-type: none"> <li>- Defining and analysing new process concepts</li> <li>- Evaluating different design options in terms of feasibility, benefit, cost, risk and select one</li> <li>- Defining requirements for implementation phase</li> <li>- Prototype the new design</li> <li>- Utilising process mapping techniques</li> </ul>	[7]–[10], [12], [15]
6. Implementing the change	<ul style="list-style-type: none"> <li>- Address migration challenges according to the type of change and develop a migration approach and strategy</li> <li>- Developing new organisation structure</li> <li>- Training of employees</li> </ul>	[7]–[9], [15]
7. Continious evaluation & improvement	<ul style="list-style-type: none"> <li>- Evaluating process performance</li> <li>- Maintaining and modifying redesigned processes</li> <li>- Link to continuous improvement programs</li> <li>- Controlling and improving the previous steps</li> </ul>	[9], [10], [16]

### 3 Innovative BPC steps

The BPC methodologies described in section 2, are mostly BPR-oriented steps, not BPC steps. Most of the previous researchers, who have defined BPC methodologies, consider BPC as BPR. For example, despite the title of the research by [9], "Business process change: A study of methodologies, techniques, and tools", they have limited their research to BPR technique, which is a revolutionary approach [17], and they have identified six steps for BPR (S-A methodology). Nevertheless, they have discussed about radicalness level of the change as a customizer for BPR steps.

Therefore, as most of the BPC steps have been defined as equal as the stages for BPR, which is a revolutionary approach, there is no specific step to identify the type/approach of the change, while this is required for BPC, because before preparation of the enterprise for change, understanding the approach, type, and scope of the change is necessary. Thus, this research adds one more step, which is "identifying the BPC type", to the above steps in order to define a BPC steps model for systems integration. In addition, two sub-steps of first stage should be expanded to three individual steps, because they are also required for "identifying the change approach". As a result, the BPC steps would be as follows:

- 1) Understanding objectives of the main project (systems integration project for this research)
- 2) Understanding existing business processes
- 3) Identifying processes for change
- 4) Identifying the change approach
- 5) Preparation for the change
- 6) Designing & Prototyping
- 7) Implementing the change
- 8) Continuous evaluation & improvement

To summarize these steps, first and second stages as well as third and fourth ones can also be merged according to their tasks. As a result, BPC steps and activities will be defined as follows.

#### 3.1 Comprehension

All understanding, analysis, and evaluation activities will be carried out during this step. The goal of the main project should be identified first. This will determine the purpose of BPC. This step firstly, answers to the following questions [15]:

- What are the scope, objectives of the main project?
- What is the role of BPC for the main project?
- Where does BPC seat in the main project's plan?
- Why business processes should be changed?

Then, all business processes will be analyzed against the main project's objectives. Main project in this research is systems integration. Therefore, we need to understand what the objectives of systems integration project are. As discussed in section 1, one of the main objectives of systems integration is integration of all departments, systems, and applications of an enterprise in order to access real time information. Thus, all business processes should be aligned with this purpose. Therefore, analysis and in depth understanding of all business processes are necessary. This will also develop objectives of new business processes.

Assessing existing business processes (As-Is), directions, and performance is necessary to understand existing business processes. Understanding customers' perspectives of current business processes is also an important input during this step [7]. Key activities in understanding existing business processes are listed as follows:

- Analyzing and documenting the current process flow (process diagram)
- Assessing and Measuring existing processes against new process objectives including fulfilling customers' needs
- Assessing cost of each business processes according to the cost of their activities
- Identifying any shortcoming in As-Is processes in order to fulfil the main project goals
- Assessing current relationships between processes
- Summarizing all findings

In summary, the purpose and scope of systems integration as well as status and capabilities of business processes are comprehended within this step, and these are carried out repeatedly, because in analyzing existing business processes we need to review the objectives of the main project several times.

#### 3.2 Identification

A couple of fundamental identifications will be carried out during this stage. Firstly, a summary of all findings from previous step regarding

analysis of existing business processes are evaluated. If any of the business processes could not meet integration requirements appropriately, effectively, and efficiently, that would be candidate for change. In addition, the business processes, which are fully aligned with the objectives of main project will be recognized and documented. After that, the approach and type of BPC should be identified. As discussed before, a specific stage is required to understand the approach/type of the change in BPC. A few researchers have talked about the level of radicalness, change strategy, and mode of change. Valiris and Glykas [10] also argued about this matter as a limitation of BPR methodology. They have considered “identification of BPR mode (incremental or radical)” as an imperative task in first step of BPR. Furthermore, reference [9] have talked about the level of radicalness for BPR. They have developed a so-called “project radicalness planning worksheet” to identify the level of radicalness. According to this technique, the radicalness of BPR is scored by a number from 1 to 5, which is assigned to 11 factors/identifiers of level of radicalness (A modified version of this worksheet is represented by Table 2).

Then, the average score of the radicalness will be calculated. Subsequently, the score will be affected by risk propensity of the decision makers. Risk propensity (which is rated from 1 (risk averse) to 5 (risk taking)), can pull down or push up the radicalness score. Reference [12] have also

discussed about this method, which is useful to determine the radicalness of change. However, BPR is a BPC type, and it is defined as a radical/revolutionary change for business processes [6]. Thus, it cannot have different levels of radicalness, such as no radicalness, because “radical change” is the most important characteristic of BPR [18]. In other words, if BPR has no radicalness, it would not be called BPR. Hence, this method is suitable for determination of radicalness level in BPC. In other words, as illustrated by Table 2, this method will be adapted, in order to be utilized for identification of BPC type/mode. Then, the average score will be applied, in order to identify the BPC approach by formula as follows:

$$RS = \frac{(Avg. score of contingency factors + RP)}{2}$$

RS = Radicalness Score  
RP = Risk Propensity

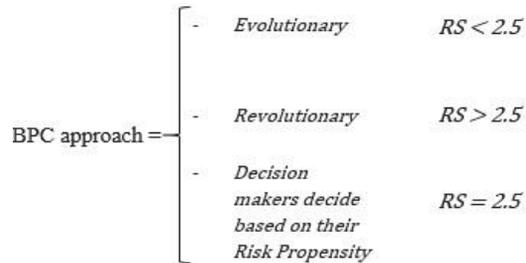


Table 2: BPC type identifier (Adopted from [8])

Factors	Questions	BPC approach				
		Evolutionary ←————→ Revolutionary				
		1	2	3	4	5
Strategic centrality	Is the targeted process merely tangential (1) or integral (5) to the firm's strategic goals and objectives?					
Feasibility of IT to process change	Does IT enable only incidental change (1) or fundamental process change (5)?					
Process breadth	Is the scope of the process intra-functional (1) or interorganizational (5)?					
Senior management commitment	Is the senior management visibly removed (1) or actively involved (5) in the BPR efforts?					
Performance management criteria	Are the preferred performance measurement criteria efficiency based (1) or effectiveness based (5)?					
Process functionality	Is the process functioning marginally (1) or is the process not functioning well at all (5)?					
Process resource availability	Are only minimal resources (1) available to support the process change or are resources abundant (5)?					
Structural feasibility	Is the organizational structure rigid (1) or is it flexibly conducive (5) to change and learning?					
Cultural capacity for change	Does the culture support the status quo (1) or actively seek participatory change (5)?					
Management willingness to impact people	Are only modest impacts on people tolerable (1) or is management willing to deal with the consequences of disruptive impacts (5)?					
Value chain target	Is the BPR effort targeted at an internal support process (1) or a core process (5)?					

### 3.3 Preparation

After identification of the candidate business processes for change and the BPC type, the scope and strategy of the change should be specified [6], [7]. Thus, all scheduling and planning activities will be carried out during this step [7], [8], [11]. In addition, all other business key drivers including the organization, human resources, and possible technological resources need to be identified and prepared for the change. Therefore, a full top management support is necessary [8], [11]. Then, a change team including business process experts, who are fully informed about the candidate processes will be assigned. Moreover, all stakeholders and other employees will be informed about the change.

### 3.4 Design

The actual changing and redesigning activities including brainstorming, defining and analyzing new process concept, prototyping, designing, and documenting new processes according to identified change approach are carried out in this step by a team, responsible for the change [7], [9], [15]. Appropriate techniques for process mapping and prototyping should be applied in this step [12]. Thus, different design options in terms of benefit for the business, cost, and feasibility must be evaluated and the best option must be selected. In addition, new redesigned processes should be fully understood, tested, and approved by designing team [7], [15]. Finally, a requirement analysis will be performed for the next step [7], [8].

### 3.5 Implementation

Having the prototype tested and approved, creating a pilot with the purpose of success can also be useful instead of a fully cutover. This is preferred for most of the BPCs, especially for which are highly visible internally and externally, and/or involve with revenues, customers, or valuable employees. Phased approach is also an economic method of implementation, which generates some financial benefit from BPC in earlier time. This approach can also be utilised after a pilot implementation [7]. Any change on organisation structure, roles, and IT will be carried out during this phase. The implementation and migration team will be assigned and the capabilities of human resources will also be improved by training

programmes under full support of top management. BPC techniques such as TQM and Six Sigma will also be applied for fulfilling this step [8], [9], [15].

### 3.6 Sustainment

The last step of changing business processes is to continuously evaluate and improve the new processes's performance and if they have addressed the requirements [9], [16]. This will allow the organisation to continuously monitor and control the business processes after the change. This will also establish more communication and coordination within the enterprise [9].

## 4 BPC steps model

Based on the explanations and objectives of systems integration and BPC, its steps and activities in this research, a model for BPC steps is illustrated by Figure 1.

As represented by this model, BPC is carried out as part of systems integration project. However, the stages are carried out in various levels, including systems integration, business process, and execution level. In other words, the activities of business process level are not separated from systems integration level, because changing business processes is designed within systems integration. Hence, the activities of every BPC step are performed in these three levels. For instance, the comprehension step starts at systems integration level, in order to understand the scope and purpose of the main project (systems integration). It endures with understanding of the role of BPC in the main project at both systems integration and process levels. As the next activity of this step, understanding of existing and objectives of proposed business processes is carried out in process level. Finally, a summary of the findings is prepared at execution level. In addition, the implementation stage is carried out only at execution level, because all the requirements for actual implementation have already been prepared in systems integration and business process levels and they are ready to be executed. In contrast, all three levels are involved in sustainment stage, as the improvement and evaluation should be continuously performed in all aspects of BPC. Consequently, any modification and improvement initiates a return to the first step of BPC cycle.

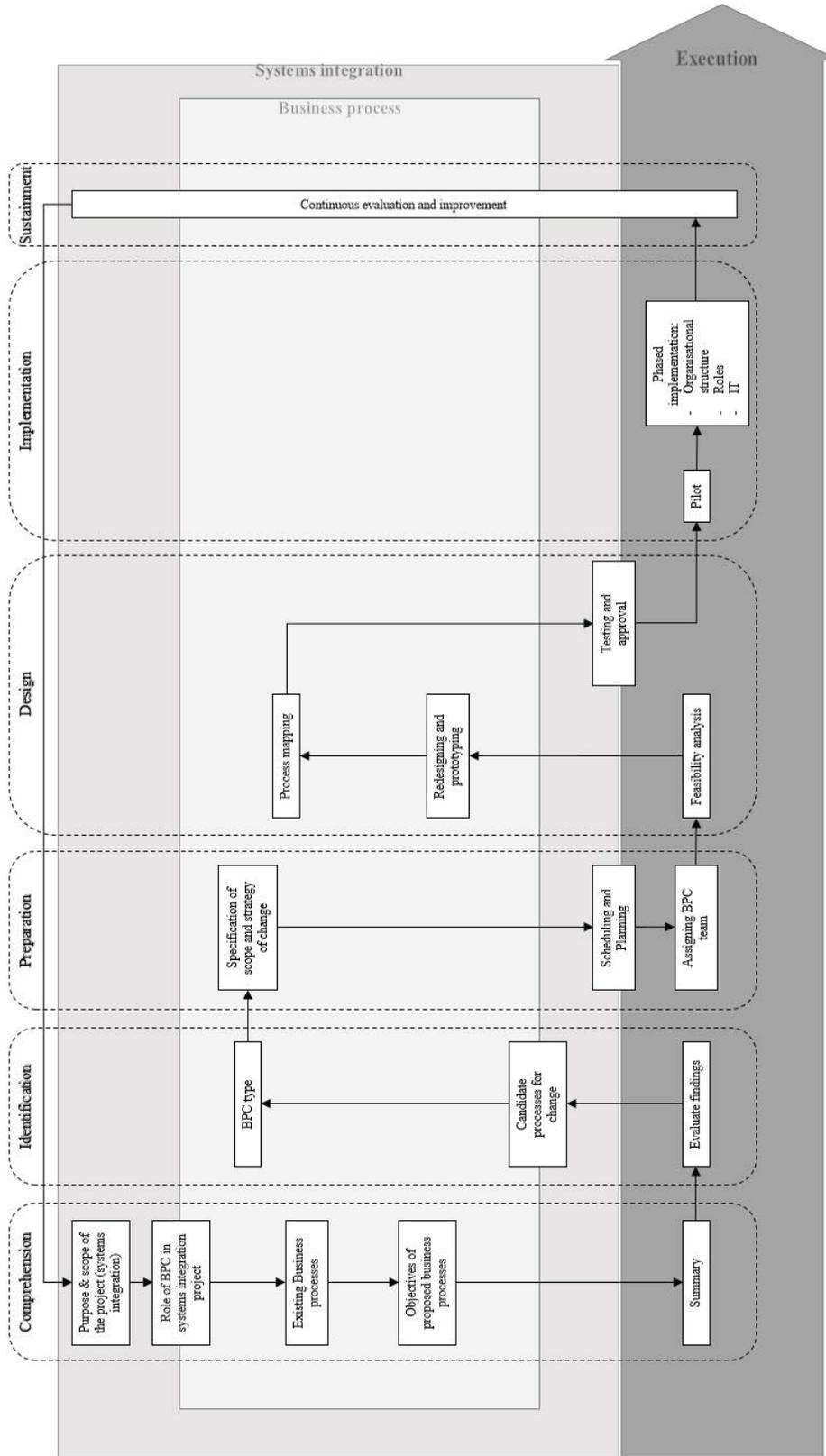


Figure 1: BPC steps model

## 5 Conclusion

BPC has been identified as a significant challenge of systems integration for enterprises in both private and public sectors. This study critically reviewed BPC methodologies provided by earlier researchers, conceptualized BPC stages for systems integration, and attempted to create an innovative model to the BPC. The model is a cyclic approach to the BPC stages, which includes identification of BPC type as an important activity within the early steps. This action clarifies the main approach for changing business processes, so that regulates the activities and provides boundaries for the next steps of BPC. Moreover, based on this BPC model, any improvement in business processes should be carried out by conducting all steps of BPC again.

## 6 References

- [1] M. Hobday, "Systems integration: a core capability of the modern corporation," *Ind. Corp. Chang.*, vol. 14, no. 6, pp. 1109–1143, Aug. 2005.
- [2] V. Javidroozi, H. Shah, A. Amini, and A. Cole, "Smart city as an integrated enterprise: a business process centric framework addressing challenges in systems integration," in *3rd International Conference on Smart Systems, Devices and Technologies*, 2014, pp. 55–59.
- [3] M. Havey, *Essential Business Process Modeling*. O'Reilly Media, 2005.
- [4] A. Lodhi, V. Köppen, and G. Saake, "Business Process Improvement Framework and Representational Support," in *Proceedings of the Third International Conference on Intelligent Human Computer Interaction*, 2013, vol. 179, pp. 155–167.
- [5] N. Berente, B. Vandenbosch, and B. Aubert, "Information flows and business process integration," *Bus. Process Manag. J.*, vol. 15, no. 1, pp. 119–141, Jun. 2009.
- [6] V. Javidroozi, H. Shah, A. Cole, and A. Amini, "Towards a City's Systems Integration Model for Smart City Development: A Conceptualization," in *2015 International Conference on Computational Science and Computational Intelligence (CSCI)*, 2015, pp. 312–317.
- [7] T. H. Davenport, *Process Innovation: Reengineering Work Through Information Technology*. Massachusetts: Harvard Business Press, 1993.
- [8] P. Harmon, *Business Process Change: A Manager's Guide to Improving, Redesigning and Automating Processes*. San Francisco: Morgan Kaufmann Publishers, 2003.
- [9] W. J. Kettinger, J. T. C. Teng, and S. Guha, "Business process change: A study of methodologies, techniques, and tools - ProQuest," *MIS Q.*, vol. 21, no. 1, pp. 55–80, 1997.
- [10] G. Valiris and M. Glykas, "Critical review of existing BPR methodologies: The need for a holistic approach," *Bus. Process Manag. J.*, vol. 5, no. 1, pp. 65–86, Jan. 1999.
- [11] P. O'Neill and A. S. Sohal, "Business Process Reengineering A review of recent literature," *Technovation*, vol. 19, no. 9, pp. 571–581, Sep. 1999.
- [12] M. Al-Mashari and M. Zairi, "Revisiting BPR: a holistic review of practice and development," *Bus. Process Manag. J.*, vol. 6, no. 1, pp. 10–42, Jan. 2000.
- [13] A. Pateli and S. Philippidou, "Applying Business Process Change (BPC) to Implement Multi-agency Collaboration: The Case of the Greek Public Administration," *J. Theor. Appl. Electron. Commer. Res.*, vol. 6, no. 1, pp. 127–142, Apr. 2011.
- [14] M. Rhydderch, "Organisational change theory and the use of indicators in general practice," *Qual. Saf. Heal. Care*, vol. 13, no. 3, pp. 213–217, Jun. 2004.
- [15] P. Harmon and B. P. Trends, *Business Process Change: A Guide for Business Managers and BPM and Six Sigma Professionals*. Morgan Kaufmann, 2010.
- [16] D. B. Harrison and M. D. Pratt, "A Methodology for reengineering businesses," *Strateg. Leadersh.*, vol. 21, no. 2, pp. 6–11, Dec. 1993.
- [17] M. C. Jurisch, W. Palka, P. Wolf, and H. Krmar, "Which capabilities matter for successful business process change?," *Bus. Process Manag. J.*, vol. 20, no. 1, pp. 47–67, Jan. 2014.
- [18] J. Kallio, T. Saarinen, S. Salo, M. Tinnilä, and A. P. Vepsäläinen, "Drivers and tracers of business process changes," *J. Strateg. Inf. Syst.*, vol. 8, no. 2, pp. 125–142, Jun. 1999.