Factors Influencing Business Process Standardization: A Multiple Case Study

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Abstract

Organizations make determined efforts to standardize their business processes in order to gain performance improvements. Having integrated and standardized data as well as processes reduces costs, improves collaboration and eases decision making for managers. Higher quality levels can be reached by successfully implemented standard processes. But due to the wide variety of business process types several challenges for the standardization of business processes exist. The diversity of business processes makes business process management (BPM) a cumbersome and complex challenge. Therefore, the main aim of this paper is to identify business process standardization success factors. As a first step, we use the categorization criteria offered by Lilfrank as a starting point for our research and develop a theoretical research model of business process standardization success. Afterwards we conduct a preliminary test of our model in two case studies at two German companies.

1. Introduction

Within today’s high competitive business environments, increasing attention is given to operational excellence and BPM. Companies like Dell, Wal-Mart, Zara and Amazon demonstrate that having well-managed business processes results in fast, flexible and cost-effective workflows. Generally, BPM accelerates effective business process improvement and tries to improve agility and operational performance. In order to achieve these goals, a wide range of methods, policies, metrics, management practices and technologies are used to manage and optimize companies’ processes continuously [4]. As a result, companies attain competitive advantages by offering unique as well as cheap products or services at highly competitive markets which nowadays are characterized by many actors offering similar goods.

BPM originates from concepts that became a subject of intensive discussion and examination among both researchers and practitioners in the early 1990s [7, 19, 11, 2, 32]. The analysis and design of workflows and business processes within and between organizations, summarized as “business process redesign”, was first described by Davenport and Short [9]. This “reengineering” represents principles of exhausting and rigorous redesign of business processes [18]. The overall aim of these concepts is to boost enterprise performance to a significant higher level while realizing benefits in terms of cost and time reductions, quality improvements as well as fast and flexible response times to customer needs [42]. In this context most of the authors stress the potential of information technology (IT) to reach maximum efficiency, especially with regard to integrating, revising, reorganizing or entirely redefining business processes [18].

Having integrated and standardized data as well as processes reduces costs, improves collaboration and eases decision-making for management [43]. Consequently, higher performance and quality levels can be reached by individually developed and successfully implemented standard processes. To manage and design well-engineered business processes throughout the entire value chain, adequate methods for the development and establishment of standardized business processes are necessary.

A number of initiatives to rationalize the practice of process (re-) design emerged in recent years. The most widely-known is the Business Process Maturity Model (BPMM), which was developed in order to provide a framework for assessing process maturity and to guide business process (re-) design initiatives [31]. Its basic concept is to measure the process capability of an organization via examining the extent to which its processes are managed (level two maturity), standardized (level three), measured (level four), and continually innovated (level five maturity). Several other researchers refine the BPMM or propose their own model [38, 20, 13, 17]. Additionally, other noticeable initiatives include the Open Process Handbook initiative [27] as well as the work on design heuristics [37].

However, several challenges still exist for the standardization of business processes [28]. These are
mostly due to the wide variety of business process types and range of attributes that characterize a business process. For example, some processes tend to be highly individual and creative [16, 40], while others are mass-customized and automated [12, 33]. This diversity of business processes makes BPM a cumbersome and complex challenge. Nevertheless, process (re-)design continues to be one of the most important topics for management executives [15]. Consequently, the motivation of our research is to identify antecedents, success factors, or inhibitors of business process standardization.

In this paper, as a first step in our research, we use the categorization criteria offered by Lillrank [25] as a starting point for identifying factors influencing the success of business process standardization. Consequently, we intend to develop and verify a catalog of criteria which allows us to assess individual standardization efforts and to identify potential areas of improvement. Therefore we developed a theoretical research model and conducted a preliminary test of our model in two case studies at two German companies. The companies operate in different industries but both try to standardize their core business processes. We focus on the following research questions: what are potential success factors of business process standardization in practice? Is it possible to improve standardization efforts by distinguishing between different types of business processes? Why do some companies achieve performance benefits, cost savings and efficiency enhancements through standardization while other companies’ efforts miss their aim?

The paper is structured as follows: in the next section we give the theoretical foundation for our research. In section 3, we develop a first theoretical research model. Afterwards, we test this model in two case studies in section 4 and present our findings in section 5. We discuss these findings from the cases in the sixth section before we conclude this paper in section 7 with a review of the limitations and contributions. Furthermore, we give an outlook to future research.

2. Theoretical foundation

2.1. Business process standardization

As Söderström [41] showed, there are several concepts subsumed under the term standardization. For example, technical, communication, modeling and industrial standards exist. In general, a standard is established through consensus by a recognized body and is providing rules, characteristics and guidelines for repeated activities and their results [41]. Fomin et al. [14] define a technical standard as an agreed-upon specification for a manner of communicating or performing actions. Burrows [3] highlights different levels of standards which have to be distinguished. He divides national, regional and international levels and therefore illustrates that standardization can exceed organizational boundaries [3].

For our research, we agree with and extend Davenport’s [6] definition. Thus, we specify business process standardization as the unification of business processes and the underlying actions within a company in order to facilitate communications about how the business operates, to enable handoffs across process boundaries in terms of information, and to improve collaboration and develop comparative measures of process performance. Consequently, a standard process always exhibits predetermined input, produces an ex-ante specified output and is repeated identically. A process is successfully standardized if it is processed each time in a predefined optimal way by doing the same activities in the same order producing previously specified output.

This definition highlights that standardized business processes usually are believed to enable companies to reach higher performance and quality. But the sole definition of standard procedures or the automation of existing processes by means of IT is not enough [18]. Rather, it is important to use methods for the development and establishment of well-engineered business processes that fit a company’s individual characteristics. For designing well-engineered business processes, managers have to establish measurements of process performance; in order to achieve process control, managers must be able to intentionally influence process performance by utilizing these measurements [36].

In this context, we refer to Lillrank who distinguishes between standard, routine and nonroutine processes [25, 26]. As his research shows, standard processes represent the highest level of control, predictability and economic efficiency. Often, repetitive business processes are predestined for being exactly defined and standardized, whereas routines and nonroutines always need a wider scope due to higher uncertainty, higher task variety and higher sequential variety [25]. Therefore, standardization is only successful if repetitive processes are easy to monitor with methods and measurements of statistical process control (SPC) [22]. Consequently, managers need to identify and separate standard processes from (non)routines in order to focus their standardization efforts on the right kinds of business processes, not wasting efforts on non-standardizable processes. Dealing with (non)routines calls for the development
of other methods and measures because standardization is not achievable in those cases.

Hence, we differentiate between three categories of business processes – standard, routine and nonroutine. It is crucial to stress that specific methods for BPM have to be defined for each of these types in order to gain performance improvements as well as to reduce processing costs. The identification of factors driving business process standardization is the first step on the road to establish such management concepts. They allow a brief analysis of a company’s overall business process setting and help to concentrate standardization efforts on standardizable core processes. Such an analysis will allow managers to explain why former standardization efforts did not produce the desired results. Furthermore it will help to avoid the futile standardization of (non)routine processes in the future. Our focus on core business processes is economically necessary because, as Sackman [39] points out, increasing business process complexity makes it almost impossible to predefine all possible workflows.

2.2. Business process categories

Generally, we understand a business process as a sequence of actions by which organizations transform inputs into outputs [1, 34, 7]. Business processes are variable sequences of work activities carried out by actors or IT [34]. According to Oakland [30], business processes can be understood as actions, methods and operations that use inputs to produce outputs that are more or less consistent to customer expectations. Therefore a process is a system that has resources as fixed assets, inputs as variable sets and services as output [25]. As business processes cut horizontally across the organization and create an interrelated organizational subsystem, they form a micro-structure of related tasks, technology and people [23].

This definition illustrates that business processes cover a wide range of activities within an organization. The spectrum ranges from iterative, simple or knowledge-intensive up to complex, creative and unique business processes. When looking at simple business processes, events and outcomes are well-understood, and process control is realizable by following established standard procedures and process descriptions [1, 36]. As the complexity of a system increases, the ability to make precise yet significant statements about the system’s behaviour decreases [45]; in those cases, process control cannot be guaranteed by traditional management instruments [45, 5]. Considering the respective degree of business process complexity, different kinds of business processes exist that must be managed adequately to establish well-engineered and controllable business processes.

A summary of the different types of processes and their characteristics according to the literature is presented in Table 1. According to Lillrank’s scheme, standard business processes are simple, designed to accept a specified type of input and to produce an ex-ante specified type of output. That is, standard processes follow a binary logic [26, 29]. They are identical, mindless repetitions or activities following scripts in order to achieve a specified target. In summary, their content variety is determined [25], which means that every activity can be processed each time in an optimal way. The task of management is to determine the best way of execution and to turn standard processes into standard operating procedures which are obligatory to all actors in an organization [26]. Since standard processes accept only predefined inputs and generate determined outputs, a tolerance limit (used in SPC) for controlling the quality of standard processes can be established. Thus deviations from the optimum can be captured [1, 25, 26].

A routine process can have two or more types of inputs, and two or more types of alternative outputs [26, 29]. Differences in the sequences of a business process arise due to variability in the work processes. The assessment of a routine process cannot be reduced to a binary logic. The input of a routine must be interpreted and classified before a finite set of actions and algorithms can be selected [25, 26]. The overall aim of a routine is usually clear, but can be achieved through different types of actions. In contrast to standard processes, routines show some uncertainties concerning the process execution. Since different actions to achieve an aim exist, the primary source of bad performance lies in inappropriate selection of alternatives. This means that experienced actors are capable to assess and classify the incoming inputs and afterwards to select an appropriate action [25]. In general, routines allow and need actors to work more flexible.

A nonroutine process is characterized by an unknown or vague set of inputs and outputs [26]. Since input is not known ex-ante, it cannot be linked with specific actions or algorithms. The input variety set is larger than the experience set employed by the process [25]. This uncertainty of process inputs may only be anticipated through high-skilled or experienced employees, who develop new knowledge and heuristics in order to accomplish the process (experts). Consequently, actors in a nonroutine process for the most part apply tacit knowledge which cannot be explicated in form of a model or process documentation [8].
Table 1: Types of business processes

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Routine</th>
<th>Nonroutine</th>
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<tbody>
<tr>
<td>Acceptance criteria</td>
<td>Single</td>
<td>Bounded</td>
<td>Open input set</td>
</tr>
<tr>
<td>Sequential variety</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Content variety (input/output)</td>
<td>Predefined, fixed output</td>
<td>Two or more inputs/outputs</td>
<td>Vague input, several outputs</td>
</tr>
<tr>
<td>Input assessment</td>
<td>Acceptance test</td>
<td>Classification</td>
<td>Interpretation</td>
</tr>
<tr>
<td>Conversion rules</td>
<td>Switch, algorithm</td>
<td>Algorithm, grammar, habit</td>
<td>Heuristics</td>
</tr>
<tr>
<td>Repetition</td>
<td>Identical</td>
<td>Similar but not identical</td>
<td>Non-repetitive</td>
</tr>
<tr>
<td>Logic</td>
<td>Binary</td>
<td>Fuzzy</td>
<td>Interpretive</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Control tools</td>
<td>Specifications, manuals, automation, SPC</td>
<td>Guidelines, repertoires, checklists</td>
<td>Shared values, competences, resources</td>
</tr>
<tr>
<td>Flexibility of employees</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Work experience</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Type of knowledge</td>
<td>Explicit/procedural knowledge</td>
<td>Declarative knowledge</td>
<td>Tacit knowledge</td>
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3. Research model

Next, we introduce our research model. As illustrated in Figure 1, we transform the characteristics of business processes as introduced in section 2 into success factors for business process standardization. We regard the characteristics as given because they have already been analyzed in relevant literature (see Table 1). Without going onto details, each relevant process characteristic of Table 1 is visualized by arrows in Figure 1. Some independent variables cover several characteristics, for example, “Degree of Interpretive Input Assessment”.

Using this model, we now propose a set of hypotheses. Firstly, as Lillrank illustrates, standard processes deal with exact predefined input factors and produce a strictly identical output. Therefore, input as well as output can be assessed by means of SPC. The best example of this is assembly line production. In such settings, only marginal variety in input factors is accepted to start the execution of a process which produces identical goods with similar quality characteristics. Consequently, our first hypotheses are as follows:

- **H1**: Low input variety has a positive effect on Business Process Standardization Success.

- **H2**: Low output variety has a positive effect on Business Process Standardization Success.

Secondly, we examine the sequence in which tasks or activities of a business process are performed. It is crucial to emphasize that routine or nonroutine processes show significant higher sequential variety than standard processes. Concluding, we formulate the following hypothesis:

- **H3**: Low sequential variety will foster Business Process Standardization Success.

Thirdly, our model suggests that processes which are often repeated in an identical manner can be standardized successfully. This third assumption supplements our third hypothesis because it illustrates that not only the sequence of process steps has to be similar to a high degree but the frequency of repetition has to be high as well:

- **H4**: High frequency of identical repetitions will foster Business Process Standardization Success.

Finally, uncertainty is the most challenging characteristic to handle. It is crucial to keep uncertainty in control because it can lead to failure in process execution. There are several ways to keep uncertainty in control. One of them is the use of control tools which can be visualized in Figure 1.

- **H5**: Low degree of uncertainty will foster Business Process Standardization Success.

4. **Figure 1. Business process standardization success factors**
H4: A high degree of repetition has a positive effect on Business Process Standardization Success.

Fourthly, the model highlights that uncertainty is an inhibiting factor which impedes process standardization. Uncertainty arises if, for example, input factors vary, employees lack the skill or experience as well as procedural knowledge to carry out a process, or influences from the business environment disturb the process performance. Therefore, we propose:

H5: A low degree of uncertainty positively influences Business Process Standardization Success.

Uncertainty causes employees to assess situations and to choose between alternatives to guarantee the successful execution of a process that is, producing the desired result. Processes that are easy to standardize raise no need for interpretive input assessment and need no tacit knowledge. This is subsumed under the following two hypotheses:

H6: The lack of interpretive input assessment via employees during a process suggests that standardizing this process is possible.

H7: The lack of employees with tacit knowledge (having only employees with explicit procedural knowledge) is conducive for process standardization success.

4. Methodology and research setting

4.1. Case study approach

To conduct a first test of our research model, we decided to initially proceed by conducting case study research within two different real-case organizations. Case studies are ideally suited if the investigator has limited control over events and boundaries of a phenomenon (e.g., the characteristics of real-life business process) and if the phenomenon and the context in which it is investigated (e.g., business processes in companies and across value chains) are unclear or closely related [44]. Challenges of BPM in social systems such as companies certainly satisfy these criteria. In the following, we describe and discuss both of the conducted cases to illustrate each case study setting and our findings.

Yin [44] highlights that during case study design and creation, research questions have to be stated (section 1). Furthermore, he stresses the need for the construction of hypotheses, which we grounded theoretically in section 2 and explicated in section 3. Finally, the unit of analysis has to be defined. Our analysis is focused on success factors influencing business process standardization of two German service providers.

In order to satisfy theoretical generalizability and to support our logical argumentation, our case studies were conducted in two different organizations [21]. The objective was to refute or to support our hypotheses by investigating two cases and comparing the results. During our studies, we had full access to all operational processes, application systems, and business process. Furthermore, we conducted a number of semi-structured interviews with several members of both organizations. We mainly derived our interview questions (used for hypotheses testing) from literature. Each interview was transcribed as a case study protocol and sent back to the key informants to guarantee correctness and completeness [10, 44]. In addition, our research items included documents, work descriptions, business process models, and field notes from observing and enquiring, all of which were collected in a case study database. This served as the main source of data for the following analysis and interpretation.

4.2. Case study setting

The first case study has been conducted at the process and software development department of a large German telecommunications service provider (TCSP). TCSP acts on a market with a sales volume of 65 billion Euro (in 2007). In the fiscal year 2007/08 the company realized annual sales of 2,308 billion Euros and an EBITDA of 456 million Euro. TCSP operates in Germany and currently engages 3,800 employees. The product roster ranges from telephony to internet products which are adjusted to individual (private) as well as business client needs. The business unit of interest uses an application called IDEFOX, a self-developed software which is used to improve TCSP’s process performance. It addresses all B2B projects across all divisions of TCSP and therefore represents unified processes which TCSP executes to conduct new business client orders. IDEFOX is applied and continuously developed to fulfill several goals: apart from complete documentation of all relevant customer information, IDEFOX is used especially for splitting large projects into subprojects, monitoring and reminding of dates, reporting functions and providing access to a central database for all German subsidiaries.

At present, all B2B orders are processed by IDEFOX. This demonstrates that the software has become a standard application within TCSP. 957 employees were registered as active IDEFOX users in May 2008. Furthermore, IDEFOX is an application
that has continuously evolved during the past years. The first version has been extended by new functionalities during several major and minor releases and thus is enhanced by new or better integrated business processes. Four major and eight minor releases have been rolled out since the pilot project in 2002. Currently, the fifth major release is planned. The data basis used for the description of the TCSP case study consists of observations which one of the authors collected during his one-year employment at TCSP and of additional findings which we collected by interviews. The interviewees, two process managers, are primarily concerned with the continuous further development of IDEFOX to guarantee TCSP’s process performance. Therefore, one of the main tasks of the interviewees is continuous BPM. As a result, newly designed and integrated processes are always implemented with regard to IDEFOX.

The second case deals with a German IT service provider (ITSP). In order to provide excellent services ITSP operates an own data-processing center and employs approximately 3,000 employees. ITSP’s service portfolio consists of IT services such as development, implementation and administration of IT solutions across several industrial sectors such as logistics, media, finance and healthcare. ITSP has branches throughout sixteen different countries and incorporates several German subsidiaries. ITSP often has to run a variety of distinct business processes during the order fulfillment. In doing so, the interaction of employees from geographically distant branches is fundamental.

ITSP’s motivation to engage in process standardization efforts resulted from its strategic objective to guarantee high service quality by unifying all internal core business processes. As ITSP installed several new branches, severe problems with overall process accomplishment and quality of processes occurred. To foster smooth process execution and process quality across all subsidiaries, ITSP decided to standardize core business processes and crucial sub-processes, resulting in the project “IQ-Care”. The major intent was to ensure that every branch could execute processes consistent to predefined definitions. Existing core business processes were conceptually modeled and analyzed by computer-aided tool support. This foundation was used by project members to develop, to model and to finally implement improved, standardized versions of these core business processes. Within the data collection phase, we conducted eight interviews. Interviewees included service managers responsible for overall service quality as well as employees (task managers, task operators) executing the processes. The service managers (process owners) are responsible for adequate service description; the corresponding interviews enabled us to investigate the types of problems that arose during ITSP’s standardization effort. We were particularly interested whether the processes as described in the conceptual models are executed in daily work exactly as specified.

Table 2 summarizes the main characteristics of each analyzed case study setting.

<table>
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<tr>
<th>Table 2: Case Study Overview</th>
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<tr>
<td><strong>TCSP</strong></td>
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<tr>
<td>Company</td>
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<td>Employees</td>
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<td>Marketplace</td>
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<td>Processes in Focus</td>
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<td>Software Support</td>
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5. Case study findings

5.1. Overview

The overall case study findings are presented in Table 3. To summarize, TCSP and ITSP show considerable differences concerning the business process standardization success factors.

5.2. Case study analysis for TCSP

TCSP is separated in seven geographically distinct divisions. Unique procedures for functionally similar business processes historically evolved in each of these divisions. According to our findings, TCSP completely missed to define or specify unified business processes in consistent documentation. Therefore each division developed its own way of doing business and executing business processes. Another factor supporting this development is the use of customer-
specific databases inhibiting central data storage, information exchange and organization-wide collaboration not limited to a single business client.

<table>
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<th>Table 3. Case study results</th>
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<tr>
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<tr>
<td>Degree of Input Variety (H1)</td>
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<td>Degree of Output Variety (H2)</td>
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<tr>
<td>Degree of Sequential Variety (H3)</td>
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<tr>
<td>Frequency of Identical Repetition (H4)</td>
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<tr>
<td>Degree of Uncertainty (H5)</td>
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<tr>
<td>Degree of Interpretive Input Assessment (H6)</td>
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<td>Degree of Tacit Knowledge (H7)</td>
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That is the reason why TCSP’s management initially decided to develop IDEFOX as a central software application which enables performance improvements in terms of better information exchange, improved collaboration, efficiency enhancements and so forth. As a result of this historical decision, process managers had to standardize distinct business processes of seven procedural differing divisions in order to implement the software. On the one hand, IDEFOX now integrates and combines the divisions in one organization-wide accepted application. On the other hand, this established standard procedures were agreed upon by all involved stakeholders.

According to our findings, the sequential variety of the newly designed business processes, now unified and implemented in IDEFOX, is low. Despite the fact that separate ways of doing business evolved in the seven businesses, the sequence of the core activities is approximately similar for each division (H3). Furthermore, the processes are repetitive and the processing of a customer order follows an algorithm which can be repeated identically.

“Due to the fact that during the execution of B2B orders IDEFOX is used as main management instrument, we are now able to execute nearly identical processes for each B2B customer frequently.” (process manager one). So the frequency of identical repetitions is perceived as high (H4).

“Degree of Input Variety” and “Degree of Output Variety” were both rated as low by the process managers. On the one hand, each customer order process only starts if a pre-defined set of inputs is available (H1). On the other hand, the process ends if a set of previously fixed output is delivered (H2). The process managers agreed that these in- and outputs vary to a low degree between specific order executions.

“Applying IDEFOX allows us to allocate our resources and predefine inputs that are required to achieve overall B2B order fulfillment” (process manager 1). Process manager 2 supplemented that IDEFOX delivers “nearly identical output allowing managerial control of process performance”.

Without the consistent input in form of a customer order, containing all necessary parameters, the subsequent business processes are not executable, resulting in binary decision logic for business process execution (H6). A simple acceptance test is enough to guarantee process execution. No interpretive input assessment has to be performed by employees (resulting in a low degree).

Due to the low input variety and the a priori fixed output, both process managers rated TCSPs degree of process execution uncertainty as low (H5). Likewise, the employees who are responsible for a customer order only need low work experience in combination with explicit and procedural knowledge to perform their activities (H7). As no tacit knowledge is needed for process execution, the last success factor is also rated as low.

5.3. Case study analysis for ITSP

ITSP’s business developed similarly to TCSP’s. Since ITSP installed several new branches all over the world, they experienced severe problems with overall business execution and quality. According to our interviews, these problems mostly arose due to different organizational cultures and differing process definitions. Therefore, ITSP’s management started the project “IQ-Care” in April 2007 to foster process standardization in order to ensure overall process quality. However, even two years after the implementation of new process definitions, the company still faces severe problems in standardizing all business processes.

Overall, the core business process within the organization appeared to be routine or nonroutine processes. However, for several processes, the project team encountered sub-processes at a micro-level that did not satisfy the criteria of standardizable processes as pointed out in Figure 1. According to the process managers, these sub-processes showed a medium to high sequential variety (H3). “There are situations where certain tasks within a process can be omitted and sometimes tasks have to be fulfilled in a different order.” (service manager 1).
Furthermore, the acceptance criteria for process execution can barely be determined ex-ante (H6). The start of a process largely depends on the experience and the tacit knowledge of employees. Due to their experience, they are able to assess the current situation and decide whether the inputs are sufficient for a process to start or not (H1, H7). To put it simply, business processes can have two or more different inputs (H1). Furthermore, output can vary to a high degree in some cases, but should nevertheless meet quality criteria within a certain range (H2).

Moreover, our interviewees stated that most of the processes are not repeated regularly (H4). “Every process is similar but not identical and needs further attention.” (service manager 2). Consequently, many instantiations of a process are unique and do not occur several times.

In general, uncertainty is an important topic within ITSP. Since subsidiaries developed their own process definitions, many business processes could not be controlled for quality. Even after the “IQ-Care” project started, uncertainty of process execution could not be eliminated (H5). This is due to the fact that most processes depend on factors from the environment that the company cannot control (e.g., customer inputs).

6. Discussion

6.1. Findings and implications

After discussing the independent variables and the hypotheses of our research model within both of our case study settings we now illustrate the resulting consequences for our dependent variable “Business Process Standardization Success”. We asked both TCSP’s process managers as well as ITSP’s service managers to assess their individual standardization success. While TCSP’s process managers rated their standardization actions as successful, ITSP’s service managers report their dissatisfaction. TCSP’s process managers confirmed that the standardization of their core processes resulted in shorter processing times and better information flow.

According to the interviews and our observations, the major difference between ITSP and TCSP is that TCSP is successful in business process standardization. This is demonstrated by the increasing usage of the company-wide accepted IDEFOX software. The continuous advancement of IDEFOX is TCSP’s main lever to guarantee standardized business processes. As a result, TCSP’s business process setting fulfills almost perfectly all the hypotheses we assumed for successful process standardization. As Table 3 and the analysis in section 5.2 confirm, all of our expected relationships between success factors and business process standardization can be found. Using our catalog of criteria would suggest successful standardization for TCSP’s core business processes.

In contrast, ITSP struggles in its effort to standardize business processes. As reported by the interviewees, severe problems during the standardization of business processes occurred. Consequently, it is not surprising that the case study findings show a completely different picture when comparing ITSP’s with TCSP’s assessment of the success factors. None of our assumed relationships is present in the ITSP business process setting, mainly due to different reasons:

- ITSP does not concentrate on its core business processes and tries to standardize almost all processes, even routines and nonroutines.
- ITSP’s computer-aided modeling tool has not evolved to a company-wide accepted standard like the IDEFOX application. Employees see the tool mainly as a manual that provides guidelines. Of course, this is mainly due to the fact that the tool is not an operative application system like IDEFOX.

Using our criteria catalog would recommend being careful when trying to standardize ITSP’s business process. As ITSP’s experiences and problems show, our hypotheses expose being valid for this case study setting as well.

Following our findings, it is more difficult to manage and standardize more complex business processes such as routines and nonroutines, and it is more difficult to coordinate more complex business process. Measures and instruments need to be developed which help to identify different types of business processes. For example, this might help in the assessment whether a business process should be considered for outsourcing or not, in assessing whether a new technology will have an impact on the standardizability of a business process, how IT risks affect business processes, or whether a business process will be affected by standard practices to reduce errors and costs.

6.2. Limitations

This research has been mostly dealing with a first test of our research model. According to Yin [44], construct validity can be improved by three tactics. The first is the use of multiple sources of evidence, which provides multiple measures for the same phenomenon. We have addressed this issue by examining two separate cases in two different domains. Accordingly, in future studies, we plan to conduct additional case studies in different organizations and more domains. The second tactic proposed by Yin [44] is that key
informants review the case study, which we have addressed in both cases: the research project was introduced and discussed with the key informant at the companies after interviewing them and collecting data; this discussion was sent to the key informant for review. Finally, Yin [44] recommends maintaining a chain of evidence, which we did by deriving success factors and hypotheses from the literature, collecting case study data, discussing it with our informants, and creating a case study diary that allows us to trace back from findings to initial hypotheses.

Qualitative but logical deduction may be used to ensure internal validity [24]. Internal validity means that a relationship between two variables may or may not be causal. In our case studies, we compared collected statements and findings with our theoretical research model to verify or to prove false our hypotheses about the success factors. Case studies can confirm, challenge, or extend a theory because they can be used to reject propositions [24]. Our research model itself has been derived carefully from literature and challenged with the case study data. But several instances are needed to support a theory. At present, the cases are the only setting for which our findings are valid. For generalization and to ensure external validity, our model needs a replication of our findings in additional cases. Accordingly, as a next step, we plan to develop more sophisticated measurement instruments and to collect data by various means, e.g., case study research, cross-case analyses, and surveys.

7. Conclusion

In this paper, we have described and discussed the theoretical conceptualization of a model to explain business process standardization success. The model has been derived by integrating existing components from different approaches and areas of research. From a theoretical perspective, our research model is a first building block for knowledge on business process standardization success. By providing a catalog of criteria, we outlined a first measurement method based on qualitative assessments. Not every business process is standardizable. If “sound” BPM is among the desired goals, researchers and practitioners may benefit from our insights on how to measure the relationship between complexity, variety and uncertainty of different types of business processes and business process standardization success.

8. References


