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Towards a Framework for Business Process Standardization

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Abstract. Organizations increasingly seek to achieve operational excellence by standardizing business processes. Standardization initiatives may have different purposes, such as process streamlining, process automation, or even process outsourcing. However, standardization of processes is easier said than done. Standardization success depends on various factors, such as existent IT capabilities, available standard frameworks, market situation, and the processes' nature, such as their level of routine or structuredness. This paper uncovers the complex nature and relative influence of process-internal and -environmental factors relevant to process standardization, by discussing three case studies from different industries. The findings are summarized in a set of initial conjectures about successful process standardization. This exploratory research is a first step towards uncovering the characteristics of successful process standardization efforts.

Keywords: Business process management, business process design, business process standardization

1 Introduction

Over recent decades, a broad range of management initiatives under the umbrella of *business process management* have been discussed and applied (e.g., TQM, Six Sigma, Lean, and others), with the aim of improving the design of business processes as important strategic assets of companies [1]. With the current economic climate demanding a focus on cost-cutting and operational excellence, many organizations specifically (re-) design their process with the view to reduce process costs through

process standardization. This may be because business processes are sought to be streamlined, automated, or outsourced: if processes are standardized then organizations can unplug one vendor and plug in another [2].

Standardization refers to the activity of establishing and recording a limited set of solutions to actual or potential problems directed at benefits for the parties involved, balancing their needs and intending and expecting that these solutions will be repeated or continuously used during a certain period by a substantial number of parties for whom they are meant [3]. Standardization, however, depends on a variety of factors, such as existing IT capabilities, available standard frameworks, existent knowledge, business strategies, market situation, and competitors.

The objective of our research is to uncover some of the factors that are relevant to the design of standardized processes. Our long-term goal is to support organizations in deciding on (a) which processes to standardize, and (b) how this can be done. In this paper, we examine three exploratory cases of organizations engaging in process standardization efforts so as to identify relevant factors that inform business process standardization. We proceed as follows. In the next section we set the scene for our research by reviewing relevant literature on process design and standardization. In Section 3 we discuss three case studies on business process standardization. We synthesize our findings in the fourth section in a set of conjectures about successful process standardization, and conclude this paper in Section 5 with a review of our contributions and an outlook to future work.

2 Background

Business processes are those value-adding activities that organizations execute to accomplish a particular objective for a particular customer [4]. Business processes can be large and inter-departmental (e.g., procurement, order management, service delivery) or relatively narrow and intra-departmental (e.g., order entry or invoice verification). Often, processes even cut across organizational boundaries [5].

Processes differ in their degree of variability. Some processes tend to be artistic [6] or creative [7], others are mass-customized [8] or automated [9]. Others distinguish manufacturing or production, and management and support processes [10]. The highly diverse nature of processes makes their management and (re-) design a cumbersome and complex challenge.

Recent years have seen the emergence of a number of initiatives to rationalize the practice of process (re-) design. For example, the *Business Process Maturity Model* (BPMM) was developed by the Object Management Group (OMG) in order to provide a framework for assessing process maturity, and to guide business process (re-) design initiatives [11]. Its general idea is to measure the process capability of an organization by examining the extent to which its processes are managed (level two maturity), standardized (level three), measured (level four), and continually innovated (level five maturity). Other noticeable initiatives include the Open Process Handbook initiative [12] or the work on design heuristics [13].

Recently, researchers have argued that not all processes fit these ‘universal’ approaches to design and management [6, 7, 14]. For example, highly creative processes are known to be unpredictable, even chaotic, ambiguous and consequently far from any routine or standard that could be applied to them [7], whereas some support processes (such as accounting or procurement) may be more likely to standardization. Lillrank [15] suggests a number of criteria to differentiate various types of processes (see Table 1).

	Standard	Routine	Non-routine
Input criteria	Single variety	Bounded variety set	Open input set
Assessment	Acceptance test	Classification	Interpretation
Conversion rules	Switch, algorithm	Algorithm, habit	Heuristics
Repetition	Identical	Similar	Non-repetitive
Logic	Binary	Fuzzy	Interpretative
Downside	Defect: a critical performance variable is outside tolerance limits	Error: a faulty classification of inputs leads to wrong routine	Failure: situation is not interpreted properly and targets are not achieved
Upside	Conformance to specifications	Requisite variety	Task accomplishment
Control tools	Specifications, manuals, automation	Guidelines, repertoires, checklists	Shared values, competences, resources
Learning	Single-loop adjustment, reduction of variation	More and sharper categories, fewer categorization errors	Double-loop learning, better interpretative schemes

Table 1. Classification of Standard, Routine and Non-routine Processes [15]

We contend that the *nature* of a process impacts on the standardization potential thereof, and, consequently, on the success of a process standardization initiative. We will use the attributes as listed in Table 1 in order to characterize the processes that were subject to the standardization efforts found in three case studies. Note that, due to the varying nature of processes within the case organizations (see below), Lillrank’s criteria informed rather than meticulously guided our analysis. Besides the processes’ nature, we will also examine environmental factors that may have impacted the cases.

3 Three Cases of Process Standardization

In our effort to exploring the factors relevant to business process standardization, we consider three exploratory case studies of companies engaging in process standardization initiatives. The case organizations were selected using convenience sampling; however, we believe that the selected sample is sufficient at this exploratory stage of our research. We conducted interviews in all cases that were recorded, transcribed and analyzed using techniques of qualitative data analysis. We also had access to online process documentations and internal process descriptions.

In the following we present each of the three cases, using a classification framework that allows us to cross-reference and compare the three cases. As indicated, we refer to Lillrank's classification (see Table 1), and also provide further detail about relevant environmental factors where appropriate. Altogether, we discuss the focus and the goal of standardization, characteristics of the initiative and the maturity level of the involved processes.

3.1 Case 1: IT Service Provider

The first case concerns a German IT service provider (ITSP, fictitious name). Eight interviews were conducted with service managers responsible for overall service quality as well as employees executing the processes. 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.

3.1.1 Case Overview

ITSP has approx. 3,000 employees, runs a data-processing center, and provides IT services such as development, implementation and administration of IT solutions across several industrial sectors such as logistics, media, finance, and healthcare. ITSP has several German subsidiaries and holds branches throughout sixteen different countries. During order fulfillment, ITSP often has to execute a variety of distinct business processes, in each of which the interaction of employees from geographically distant branches is necessary.

Due to the installation of several new branches, ITSP experienced severe problems with overall process accomplishment and quality of processes. Consequently, ITSP decided to standardize core business processes and underlying support processes to enable smooth process execution and process quality across all subsidiaries. The main concern was to ensure that every branch could operate the processes consistent to predefined process definitions. Existing core business processes were documented using a customized version of ARIS. This foundation was used by project members to develop and finally implement improved, standardized versions of the core business processes.

3.1.2 The standardization procedure

To make the core business processes obligatory for all business divisions, ITSP tried to achieve standardization by conducting a centrally managed project, which traversed through different phases: during the process definition phase, the project management team dealt with the company-wide process description and documentation of existing business processes. For each core business process, an experienced process owner was defined who was responsible for the correct definition of the process. In a top-down approach, the overall structure of the core business processes was modeled at a macro-level, followed by incremental refinement. The

standardization effort resulted in a detailed business process documentation of a first part of the core business processes, divided into sub-processes at the micro-level.

Upon unification, review, and approval of process documentation, the next stage of the initiative commenced. All employees working within processes affected by the standardization project attended trainings to become familiar with the established process standards. At the end of this stage, additional training was provided. Finally, the approved business processes were implemented.

3.1.3 Assessment

ITSPs standardization effort focused on all those core business processes and corresponding sub-processes that an order has to pass through during the fulfillment cycle. Due to the high strategic importance of the project, significant monetary and human resources were invested in the design of improved, standardized processes at a very high level of detail. Our analysis reveals that many of the analyzed processes are routine rather than standard processes; processes appear similar on a macro-level but show striking differences upon closer examination. Hence, some of the processes exhibit significant sequential or task variety at a more detailed level and therefore are rather complex and not repeatable. Employees rejected, or were unable to use, the process definitions in some cases and rather relied on their own routines and habits instead. In conclusion, the inherent process complexity was not sufficiently absorbed at the macro-level. In addition, end user acceptance of the new process designs was quite low, further hampering the initiative, and counteracting a progression in maturity as per the BPMM model.

3.2 Case 2: Visual Effects Production

The unit of analysis described in the second case is an Australian Visual Effect Company (VFXC, fictitious name). The sourcing strategy involved semi-structured interviews and the use of process modeling techniques. Two analysts were involved in the process of data collection and we interviewed a total of six people. Both creative supervisors who act as operational process managers and artists were interviewed. In the first place, the project aimed at investigating processes that rely on creativity and thus focused on the stage of process analysis. It was hoped that the results of this analysis would support VFXC in standardizing their processes. Process improvement and standardization in VFXC then became an ongoing BPM initiative. VFXC's motivation for process improvement and standardization primarily results from the objective of mitigating and avoiding risk.

3.2.1 Case Overview

VFXC processes can be characterized as highly relying on creativity, client-focused, complex, inter-dependent, but also repetitive. The organization produces visual effects; i.e., computer-generated artifacts that are combined with conventional

film material. The organization has more than 100 employees and works with internationally known film studios. VFXC's core process is the so-called *production pipeline*, which comprises of a number of highly interwoven sub-processes; examples include *modeling* and *animation*. One major challenge in managing processes in visual effects production is the mitigation and avoidance of risk. Due to the involvement of different stakeholders who often cast subjective judgments over creative products, processes are linked to *creative risk*. At the same time, processes are characterized by *operational risks*, such as the potential mismatch between an organization's technical capabilities and requirements for the creative product [7].

3.2.2 The standardization procedure

In the stage of process analysis it became clear that VFXC's processes are characterized by high levels of uncertainty with regard to process outcome, structure, and required resources. Processes have a high demand for flexibility. Consequently, standardization in a sense of establishing and recording a limited set of solutions to actual or potential problems (compare section 1) becomes less desirable. However, it turned out that VFXC's processes comprise of both well-structured parts and highly creative parts. The latter one may be referred to as *pockets of creativity* [7].

The project thus subsequently focused on indentifying those parts that are characterized by creativity (that is, uncertainty with regard to outcome, process, and required resources) and understand how they interact with rather well-structured process parts. For example, this approach allowed VFXC to move well-structured data-handling tasks to the IT department and thus allowed creative people to spend more time on their creative work. As indicated, process improvement and standardization became an ongoing initiative supported by the top management.

3.2.3 Assessment

VFXC's processes comprise of both highly creative parts and well-structured parts. Based on the findings of the above described project we can conclude that creative parts, or pockets of creativity, should not be subject to standardization efforts. Well-structured, non-creative tasks, however, may be subject to such efforts. The challenge can thus be seen in identifying those parts of creativity-intensive processes that are characterized by high-levels of creativity and those parts that are well-structured and predictable. These sections may then become subject to process automation or outsourcing, for example (see, for instance, the example provided in [9]). The study also revealed that higher efficiency of well-structured, predictable sections allows organizations to allocate more resources, in particular time and budget, to the processes' creative sections which, in turn, is associated with higher creative performance. Non-standardized processes (i.e., routine and non-routine "pockets of creativity") will always exist because of the organization's creative nature; therefore higher levels of BPMM in its traditional sense are also unlikely.

3.3 Case 3: Insurance Software Implementation

The unit of analysis described in this third case is an Austrian Insurance Group (AUSIG, fictitious name). We collected the facts on this case by interviewing a project team member working for an external consulting company involved in the project. The objective of this project was the development of a rapid implementation approach for the group's standard software. AUSIG was acquiring different regional insurance companies in central and Eastern Europe and faced issues associated with the implementation of standard insurance software based on the solutions developed for the Austrian market. AUSIG recognized that the differences, and commonalities, of the business processes in the different countries had to be understood in order to come up with a fit/gap analysis. The results would then be used for the implementation in a particular country.

3.3.1 Case Overview

AUSIG offers an extensive range of insurance products. The group's operations cover the different stages of the insurance value chain, including underwriting, policy administration, claims handling, payments, risk management, and accounting. Altogether the group has about 18,000 employees. The newly acquired subsidiaries in Central and Eastern Europe need to be aligned to the group's operations in order to leverage synergies. The group uses a range of standard software products that support insurance operations. The implementation of country operations based on these software solutions has proved to be unexpectedly difficult in the past, causing AUSIG to seek a more systematic approach to manage implementation projects. The group decided to adapt the ADONIS business process modeling approach [16] and have it tailored to its requirements by an external consulting company.

3.3.2 The standardization procedure

The project aimed at defining a so-called rapid implementation approach for the group's standard software. It started in September 2007 and completed in April 2008 and covered two major phases: first, the definition of a methodology and, second, the application of this methodology for one particular implementation project with a single country subsidiary which was running an implementation project at that time. The ADONIS business process modeling approach was considered since the tool was already in use throughout the group. The project team decided to include business processes, products, documents, roles, and software use cases in the newly designed approach. Also different extensions were introduced to ADONIS, in particular for capturing information on variants enabling the generation of reports on fit/gap analysis between standard group processes and country variants.

3.3.3 Assessment

The methodology developed in the project was found useful for approaching the challenge of software implementation processes in the different countries. AUSIG aims to use the methodology in upcoming implementation projects. The project identified one major challenge of standardization: While core insurance processes can be standardized from a business point of view, there are several national regulations that demand pockets of variability for the different countries.

4 Discussion

Table 2 and Table 3 summarize the characteristics of the standardization initiatives and their respective processes. The three cases show that the case organizations vary in the way they managed their standardization initiatives, on which level of detail they (re-) designed their processes, and what extent of resource commitment was involved.

The three cases provided examples for processes that display differing standardization potentials. For instance, while processes from ITSP (Case 1) tend to be routine, processes from VFCX (Case 2) show highly non-routine components (pockets of creativity), and are mainly characterized by uncertainty and high levels of flexibility. In contrast, AUSIG (Case 3) featured highly repetitive processes that varied only in parts across countries. Whereas most processes of AUSIG and the core processes of ITSP could be standardized, the core process of VFCX, the so-called production pipeline, turned out to be a quite creative process not amendable to standardization. However, this process also includes well-structured parts that can be subject to standardizations efforts. For instance, VFCX was enabled to move well-structured data-handling tasks to the IT department which, in turn, allowed creative people to spend more time on their creative work.

The cases further differ in the extent of end user involvement, strategic commitment, and process maturity. For instance, it is noticeable that, VFCX and ITSP were ranked level 2 “managed”, while AUSIG was ranked level 3, “standardized”. Thus, all three organizations have at least moderate levels of BPM maturity, indicating a positive correlation with standardization potential. However, it is unclear if the BPM is sufficient to allow for the assessment of more “differentiated” process standardization initiatives, which necessarily focus only on those parts of routine and non-routine processes that can be standardized.

Characteristics	Case 1 (ITSP)	Case 3 (AUSIG)
<i>Focus of standardization</i>	ITSPs standardization effort concentrated on core business processes. In order to enable smooth process execution, underlying support processes were also standardized if required.	Procedural model for the implementation of standard insurance software in subsidiaries of the AUSIG group.
<i>Characteristics of processes subject to the initiative</i>	The processes are characterized by similarity, but are not identical (e.g., different customer solutions). Processes boundaries and involved actors are fuzzy. Guidelines and checklists are frequently used. All in all, processes can be classified as "routine".	The processes are characterized by algorithmic decision rules.
<i>BPM level of processes</i>	ITSP's overall business processes correspond to level two (<i>managed</i>) because non-standardized core business processes still exist. Only the part of the core business processes that were standardized during this first project meet level three (<i>standardized</i>) requirements.	AUSIG's overall business processes correspond to level three " <i>standardized</i> ", but show a great variety in the different countries.
<i>Motivation / goal for standardization</i>	To guarantee high service levels and process quality in order to enable process execution constantly throughout all subsidiaries.	Enable a systematic and rapid implementation of the group's standard software.
<i>Management of standardization</i>	A central project managed by a team consisting of service and task managers as well as task operators and defined process owners.	Central project managed by project team sponsored by board.
<i>Level of detail of standardization</i>	Initially, the overall structure of the core business processes was defined at a macro-level. Over time, the coarse descriptions evolved to a detailed process model reflecting sub-processes on a micro-level.	Business processes and related artifacts were documented on three levels of detail.
<i>Spent effort for standardization</i>	No information available due to missing estimation and control techniques.	One analyst was present at a limited number of occasions. No detailed information is available due to The other analyst spent 2 months full-time with VFXC in missing estimation and control techniques. order to model and analyze processes.

Table 2. Characteristics of the Cases (1)

Characteristics	Case 1 (ITSP)	Case 2 (VFXC)	Case 3 (AUSIG)
<i>End user involvement</i>	Task operators, task managers and service managers all are familiar with the business process which is the object of standardization. Additionally, the process owner ideally is the company's most work-experienced employee concerning the process s/he is responsible for.	The efforts in the analysis stage involved artist who carry out the analyzed processes as well as visual effects supervisors who have in-depth knowledge of the analyzed end-to-end processes.	No end users were involved.
<i>Strategic commitment</i>	Continuous top management support is attained by integrating the chief executive officer into the validation process of the <i>process definition phase</i> .	Continuous top management support is attained by integrating the chief executive officer into both process analysis and definition.	The project was sponsored by the board of the group.
<i>Applied techniques</i>	An extended version of the ARIS modeling technique is deployed.	An extended version of the ARIS modeling technique was used in the stage of process analysis. Semi-structured interviews were used in order to gain an in-depth understanding of the processes.	An extended version of the ADONIS modeling technique was used in the stage of process analysis.
<i>Experience of project team</i>	All team members, especially the service managers, are experienced process experts which operate on a daily basis within the affected business domains. They all exhibit knowledge about standardization and the management of standardization projects necessary for their daily work.	The analysts who conducted the process analysis as well as the semi-structured interviews were process experts who were familiar with the domain being investigated.	The analysts who conducted the process analysis as well as the semi-structured interviews are process experts who were familiar with the domain being investigated.
<i>Size/complexity of standardization initiative</i>	The complexity of this standardization project is very high because its main goal is the standardization of all core business processes which themselves are very complex and customer-specific.	The complexity of this project is moderate as it focuses on the organization's core process.	The complexity of this project is moderate as it focuses on the group's core processes and those of one subsidiary.
<i>Scope of standardization initiative</i>	The core processes of the entire company should be standardized in the end. Therefore, each foreign subsidiary is affected by this project.	The initiative aims at analyzing and, if possible, standardizing the organization's core processes. Based on the analysis, the organization started to move certain well-structured, non-creative tasks away from the key creative people.	Definition of the methodology and application in one country subsidiary.

Table 3. Characteristics of the Cases (2)

Obviously, non-routine processes are less applicable to standardization than routine processes. The criteria introduced by Lillrank [15] (see Table 1) may thus be used in order to facilitate the process of deciding whether a process may be standardized or

not. However, through our case studies it became apparent that even those processes that are non-routine, or even creative, may comprise sections that may in fact become subject to process standardization. Consequently, we conjecture:

Process analysts need to understand whether a process is amendable to standardization as a whole, or whether only sub-processes may be subject to standardization. Generally, non-routine (sub-) processes are not amendable to standardization.

Our analysis also revealed that process standardization initiatives are carried out with quite differing objectives. While ITSP (Case 1) aimed at the rather broad objective of facilitating “smooth processes” and attaining “higher process quality”, VFXC (Case 2) aimed at mitigating risk, and AUSIG (Case 3) aimed at introducing a standard software for insurance companies. Consequently, we conjecture:

Process analysts must consider the purpose of the initiative to decide what aspects of a process (structure, documents, resources, etc.) can be standardized.

We argue that these two conjectures are not mutually exclusive, and need to be considered simultaneously when launching standardization initiatives. A possible implication of these conjectures is that organizations should screen their processes to pinpoint those (sub-) processes that are standard, routine, or non-routine. At the same time, they should decide, for each (sub-) process, whether process-flow, process-outcome, or required process-resources (such as documents) will be subject to standardization. It can thus be concluded, that any process standardization initiative needs to carefully consider the organizational context as well as the processes’ nature.

5 Conclusions

In this paper we discussed different factors relevant to business process standardization. We have shown that processes subject to standardization efforts may differ across a set of defined attributes. Most notably, there are different parts of processes that need to remain open for creative decision making (pockets of creativity) and others that have to meet legal regulations of different countries (pockets of variability). Moreover, standardization initiatives are carried out with different purposes. While this paper discussed different process initiatives, it did not provide a final conclusion on how organizations can actually decide whether a process is amendable to standardization and what aspects of a process may be subject to this standardization. Instead, based on our insights, we provided a set of conjectures that speculate about factors pertinent to successful process standardization.

We realize that the scope of our effort to date has been limited to a restricted set of organizations, the selection of which was based on pragmatic rationale. Access to more organizations is needed to uncover further details relevant to standardization. For instance, manufacturing processes in the consumer products industry display a unique ratio between standardization and localization, epitomized in the ‘line of visibility’ (how much of a process is disclosed to the customer, how much is internal and standardized?). Accordingly, we will extend our research to cover a wider range of business process across different industries.

Aside from extending our case studies, our future research aims at distilling more concise guidelines on how processes can be assessed, in order to decide how organizations approach process standardization initiatives. This requires an in-depth understanding of factors that impact on the standardization of business processes. Some of these factors we suggested in this paper, with the intent of further broadening and deepening our analysis in future studies.

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