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Business Process Management Cases

Digital Innovation and Business Transformation in Practice

M.Sc. THESIS
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Digital Innovation and Business Transformation in Practice

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Abstract

The fast pace of changes in the international and domestic market make companies vulnerable to the new processes and requirements. In this environment, the major challenge for the organizations is to emerge innovative ideas from research and practice. Business Process Management (BRM) is an effective approach to govern, upgrade and maximize organization's activities and procedures. Several excellent sources exist that summarize BPM is the ultimate tool to convert the tremendous number of concepts into product and services. Business Process Management assists organizations in a multilateral way since it is a wide concept that embraces many other approaches just as Process Modeling, Process Optimization and Performance Measurement. The aim of this thesis is to correlate the theoretical knowledge with the practical appliance of real – world BMP cases. In order to accomplish the targets of this dissertation, inductive research approach is applied. In the modeling phase of this study; the research starts with data collection and process model will be developed based on the gathered information. The necessary data about Business Project Management cases was obtained from the book "Business Process Management Cases" (Brocke&Mendling, 2017). Each of these case studies is sorted according to a uniform structure comprising the following parts: (1) Introduction, (2) Situation faced, (3) Action taken, (4) Results achieved and (5) Lessons learned. To better understand the data and come up with safe results, a table was created for each case study. Each table is consisted of the following 9 categories: (1) General information, (2) Intention, (3) Core element, (4) Situation faced, (5) Life cycle, (6) Actions, (7) Model, (8)Results achieved and (9) Lessons learned. The BPM cases can be classified in four different sections. Part I gathers the eight BPM cases that are related primarily to strategy and governance, Part II presents eight BPM cases that focus on methods, Part III contains nine BPM cases that address IT, and Part IV introduces six BPM cases that highlight people and culture. The classification of the BPM Cases reveals the broad spectrum and richness in which BPM can be applied. The assembled information can be more than inspiring for researchers who are interested in the state of the art of BPM.

Key words & Phrases: Business, Business Process Management Cases, Digital Innovation and Business Transformation in Practice, BPM Lifecycle, Process Modeling, Process Optimization and Performance Measurement

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Finally, I am extremely grateful to my parents for their love, prayers, caring and sacrifices for educating and preparing me for my future. I am very much grateful to my wife Eleanna for her love, understanding and continuous supporting to complete this research work. This thesis is dedicated to them.

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1.INTRODUCTION

1.1 Background

In today's globalized world, the international and domestic market is becoming more and more competitive between the businesses. Many organizations face intense difficulties under this competition and they attempt to improve their products or services with any mean. Under those circumstances, it's a crucial necessity for business organizations to become more independent regarding on their ability to adjust their processes in the new requirements. An effective solution that has gained increasing attention to that kind of problems is called Business Process Management (BPM). Business Process Management is the research field in operation management which specializes in discovering, analyzing, measuring and automatizing new business processes. The main object of BPM is to transform the abundance of innovative ideas into products and services and in order to achieve its purpose combines several methods and techniques. BPM targets also in more flexibility, increased accuracy, cost savings and reduced investment. Business Process Management is a spacious field and is affected by many other approaches just like Process Modeling, Process Optimization and Performance Measurement. The process of BPM adoption normally starts with raising a general awareness of BPM and continues by specifying in isolated projects.

BPM is a multilateral procedure that includes Process Modeling, Process Optimization and Performance Measurement. BPM typically begins by studying the business processes and continues by redesigning the existing processes. After the initial modeling of business processes, the processes should be constantly monitored and optimized. This approach motivate companies to trace back their origins, improve or eradicate the processes that aren't functional and to create an efficient environment of analysis. In order to manage business processes, it is essential to measure and possess information on the current progress and past performance of the processes.

In conclusion, Business Process Management is a combination of innovative ideas and technologies to come up with new business processes and improve primary organizational activities. BPM helps companies to achieve a strategic program and reinforces the correlation among organizational strategy and business processes.

1.2 Aim and objectives on the thesis

There is an extended literature which refers to how effective Business Process Management is and how it has transformed from a “hot topic” to the “new normal”. As in any other theoretical field, it is common to exist a theoretical – practical gap. The gap between the theoretical knowledge and the practical application of BPM, most often expressed as a negative entity, with adverse results. No matter how well a project is prepared and how many obstacles has been foreseen, there is always a small possibility of failure because every case is unique. The aim of this thesis is to study the “real world” applied cases of Business Process Management in order to increase the knowledge on the theme and close this gap between education and practice.

1.3 Research Methodology

Essential for the completion of this study is the book “Business Process Management Cases: Digital Innovation and Business Transformation in Practice, which is written by Jan vom Brocke and Jan Mendling. The authors assembled 31 cases in which companies that established Business Process Management achieved tremendous results. Each of these cases has been classified into four categories according by the core elements of BPM. The first one includes cases that relates to strategy and governance, the second one represents cases of BPM methods, the third one analyzes cases on information technology and BPM and the latter onediscusses BPM-related issues of people and culture. Each of those cases has been analyzed by taking account of:

- The Introduction – This part summaries the story of the case and the key figures of the company.
- Situation faced – This part specialize the context of the case, the constraints that has to be overcomed as well as the objects of the BPM.
- Actions taken – This part analyzes what has to be done and the innovative measures – methods that has been applied in order to achieve the desirable results.

- Results achieved – This part contains not only the observation of the measures that has been taken but also the consequences of those actions. They also point how the far the expectations were met on not.
- Lessons learned – This part discusses the overall case and grounds certain lessons that have to been taken into consideration from others who are also interested into the theme.

1.4 Thesis Layout

This thesis is comprised of five chapters.A brief description of the chapters of this thesis is provided below:

Chapter 1 is an introduction which goes through the background, motivation, contribution and the methodology of the study.

Chapter 2 involves the literature on the topic of Business Process Management, Process Modeling, Optimization and Performance Measurement

Chapter 3 gathers information from the book "Business Process Management Cases" (Brocke&Mendling , 2017) about Business Project Management cases. The aim of this book is to increase knowledge exchange based on real-worldBPM projects for fostering both BPM education and practice.

Chapter 4 is the solution and implementation part of the thesis and investigates the modeling and optimizing the certification process. The implementation of the Business Project Management helped organizations to come up with certain problems, become more competitive and provide important lessons for the future

Chapter 5 presents the findings of this thesis and is the conclusion chapter.

2. LITERATURE REVIEW

2.1 Introduction

In our rapidly developing society, that technology seems to progress in leaps and bounds and technological progress and achievements tend to spread like wild fire around the globe, competition among firms had become more intense. For this reason, it has become essential for firms to be able to respond to environmental changes, and adapt their processes to the new environmental conditions. Nowadays, being able to adjust to rapidly changing conditions, is a serious challenge for businesses. In particular, managers find it demanding to come up with optimal solutions in topics related to organizational structures, leadership competency and technical ability.

In order for corporations to tackle effectively all of their problems and enhance their profitability, implementing Business Project Management (BPM) has become a crucial factor for their survival. This chapter of my dissertation introduces a synopsis of the topic of BPM. The structure of this chapter involves the following subsections: Section 2.2 presents background information of BPM topic. It also introduces the lifecycle of BPM, and important contributions of this method. Section 2.3 offers a literature review on the issue of Process Modeling and Modeling Techniques. Lastly, section 2.4 presents an outline on Performance Measurement and Performance Measurement Systems.

2.2 Background Information on Business Project Management and Lifecycle

2.2.1 Business Project Management

Business Process Management (BPM) constitutes a method which assists businesses and organizations to harmonize their strategic objectives with their operational objectives of enhancing efficiency of their actions and strategies in the dynamic business environment. Businesses and organizations achieve their goals by establishing a set of business processes. It should be mentioned, that it is deemed of crucial importance that firms should continuously improve and change their operations based on the current state of competition. BPM is an amalgam of practices which concentrate on transforming institutional value via a process-oriented excellence.

Initial research projectson the ground of business process management (BPM) concentrated on the (re-)design of single processes. However, current contributions on this field emphasize on more holistic perspective of the governance of organizational processes. Hence, contemporary Process Management includes an incorporated set of business capabilities, including strategic alignment, governance, methods, technology, people, and culture, to analyze, design, implement, consistently enhance, and subversively innovate business operations (Brocke&Rosemann 2014).BPM's origins in initial research projects of business design (e.g., Taylor, 1911) then turned into the more extensive control of industrial engineering and has since continue to focus on the analysis of operational activities in the chief manufacturing sector. A rise in the importance of duties, the increasing significance of information technology for the design of business processes, and the total recognition that processes are a crucial business asset have exalted Business Project Management into a discipline(Brocke&Rosemann 2014).Hammer in 2010, claimed that the origin of Process Management is distinguished by two developmental paths: (1) process improvement and (2) process development.

During the past years, organizations, businesses and different operations were forced to move from function-oriented arrangement to process-oriented structure. The difference between the two, is that a function-oriented business governs the organization along functional lines, whilst a process-oriented firm places more emphasis on business processes. In each instance, business optimize their strategically activities. Yet, the crucial difference between them is that optimizing a functional unit may disturb other functions of the firm, while optimizing the business processes has positive effects on the entire organization. The process-oriented strategy of firms appeared from early 30's when Nordsieck in 1934figured out the importance of the contribution of process-oriented business framework. This inclination persisted and so researchers still bring this topic in discussion[eg (Porter,1989), (Scheer, 1990), (Davenport, 1993) and (Hammer,1993)]

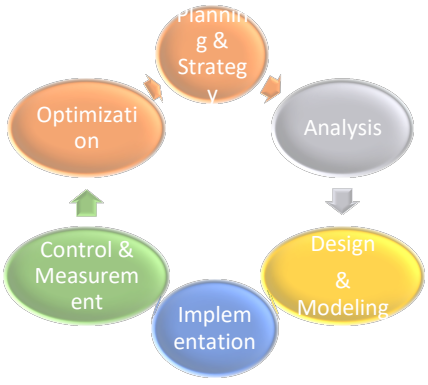
Business Processes Management can be separated into an important number of groups and perspectives. In addition, there is a significant number of approaches regarding this classification. For instance, Ould in 1997 introduced a classification based on the perspective of "Value Chain" by Porter in 1995. This classification splits the processes according to roles

and into three classes: (1) Core process: This process helps the organization to achieve its objectives regarding issues such as production, sales and distribution of products. (2)Support processes: This process is important for secondary activities within an organization, such as technical support, human resources and accounting. Although this type of process does not increase the value of the organization, is of crucial importance for ensuring the continuation of core processes and as a consequence facilitating the process of adding value. (3) Management processes: This process is responsible for controlling business operations and operation of systems (eg decision making, governance). This process does not directly add value as the previous one. Nevertheless, it is of essential value for reassuring that a firm works in an effective way.

Business Process Management refers to management approaches of harmonizing business processes to improve the effectiveness of businesses. Business project management is a systematic approach to document, identify, design, execute, monitor, measure, and control automated as well as the non-automated business processes to accomplish results aligned with the organization's strategic goals.". It turns into evident that Business Project Management advocates corporations to enhance their processes consistently, so as to offer efficient service or product by focusing on process-oriented business structure. Process Management possess its own lifecycle. Lifecycle will be presented below.

2.2.2 BPM Lifecycle

The BPM lifecycle provided by ABPMP consists of six phases including: (1) plan, (2) analyze, (3) design, (4) model, (5) measure and control, and (6) transform.



Planning and Strategy: At this point, we define we define the project and process scopes, roles and responsibilities, organizational resources as well as the technologies.

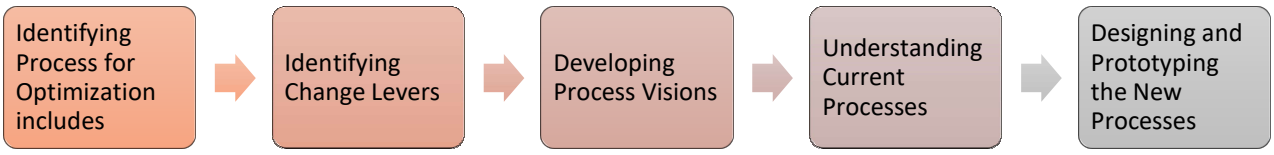
Analysis: At this phase, we deal with the operations and goals to harmonize business processes with their organizational goals.

Design and Modeling: In this phase, we investigate various features of business processes. This phase presents how business applications, data resources, technology platforms, financial and operational measures interact with internal and external processes.

Implementation: The implementation of BPM can be introduced either with using a Business Process Management System (BPMS) or without a software system. In the event of employing a software system, an implementation platform must be used, designed and also integrated incorporated on the business environment.

Control and Measurement: The monitoring and control of business processes tackle with modification of business resources to make sure that the business goals are reached.

Optimization: Process optimization addresses the modifies and continuous progress of corporation processes. The most regular objectives of process optimization are minimizing cost and maximizing throughput. The process optimization involves the following: Identifying Process for Optimization includes, Identifying Change Levers, Developing Process Visions, Understanding Current Processes and Designing and Prototyping the New Processes (Davenport, 1993)



It is apparent that organizations implement Business Project Management for various reasons. One of the most important of them is to become more competitive in the market. By utilizing BPM and explicit representation of business processes, organizations can expect

not only lower costs and higher revenues, but also motivated employees and satisfied customers.

2.3 Literature review on the Process Modeling and Modeling Techniques

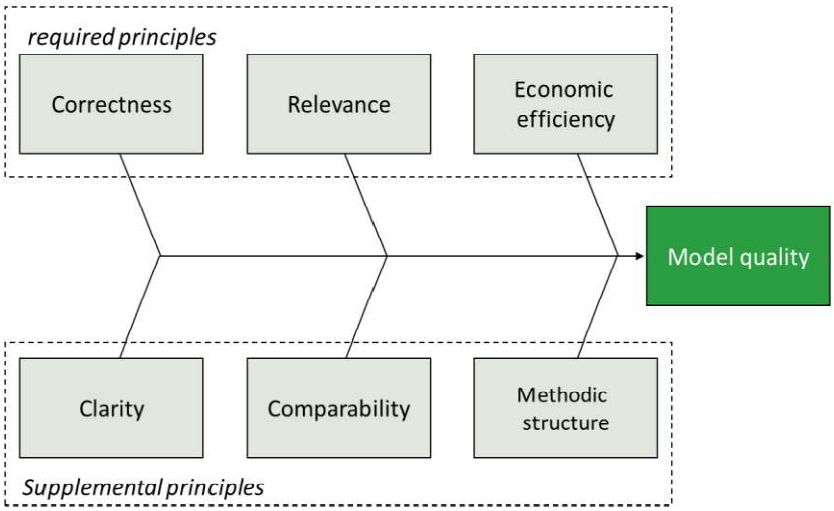
Due to the fact that global competition rapidly increases, it is deemed of crucial importance for corporations to come up with the impediment of the competition. In this environment, it is of essential importance for firms to refine their business processes to be as effective as it is feasible. Concentrating on business processes, that converts inputs into outputs, enables corporations to grasp and handle materials, information, as well as the people in a holistic method (Gavin, 1998).In order for the managers to concentrate on the corporation's strength points, control resources and eliminate the weaknesses of a business, organizations should model and document their processes. In the context of Business Project Management, the process models have a vital role. This is because, Process modeling advocates the firms to realize their business processes in a correct way and to separate between value adding and non-value adding processes. That is to say, process modeling uncovers obscure or demanding business processes (Biazzo, 2000). Business process modeling pictures the business logic within a corporation and assesses and its functions consistently (Ungan, 2006).BPM models are assembled in the design phase of the BPM lifecycle. It is important to mention that, the yield of process modeling shall be taken into account, so as to be able to determine business process modeling. Modeling processes or otherwise stated the clear representation of business 24 processes is of crucial importance within BPM. This is because, is a medium of communication among stakeholders of processes and also establishes a usual and apparent comprehension of business processes (Weske, 2007)Typically, the process models are distinguished by three basic characteristics: (1) a mapping, (2) an abstraction and (3) fit for purpose (Dumas et.al, 2013). Mapping of processes works in transforming real-world processes into models, the level of abstraction refers to the pursuit of hiding irrelevant details for the process model, and the purpose of a model is of crucial importance in order to demonstrate the objective of the model. In the following paragraph, we a synopsis of the process of modeling.

In the process of modeling, the necessary steps to establish a proper model by using a modeling language are identified. Frederiks and van der Weidein 2006 established a 4-stage model for information modeling procedure. According to them, the four phases of modeling procedure are: (1) elicitation, (2) modeling, (3) validation and (4) verification. The elicitation step has as a goal to identify the requirements of the process stakeholders. Thereafter the information which is obviously accessible must be transferred into an agreed format. Through out the phase of modeling, important modeling concepts and their relationships are conducted. For this reason, it is deemed of crucial importance that the unified format and the selected modeling language, the process instances and activities are recognized and be included in the models. In the verification phase, checks are made to check for the correctness and consistency of the model. Finally, validation phase is responsible for controlling for the validity of the specifications of the models. It is important to mention that the cooperation among stakeholders during the modeling procedure is of essential importance, as collaboration enhances the level of communication and negotiation. To develop a suitable model during the modeling procedure, Guidelines of Modeling (GoM) should be taken into account. In the next paragraph are presented these principles to create good models.

In 1995 Becker et.al reported six principles to create a consistent model. Correctness, relevance, and economic efficiency are the three necessary pre-conditions while the three other principles of clarity, comparability and systematic design are considered as optimal.

- **Correctness:** Indicative correctness can make sure that the structure as well as the behavior of the model is sound with reference to the true world. Moreover, the regularity between different models is regarded as well as within the framework of the correctness of the model.
- **Relevance:** The relevance principle premises three aspects. At the outset, a relevant object system of discourse should be chosen. Secondly, a pertinent modeling technique as well as the modeling language should be taken or an existing meta model it is essential to be designed. Finally, a suitable model system must be developed.

- **Economic Efficiency:** In the course of business process modeling, economic efficiency plays a really important role regarding the trade-off between the benefits of certain features that are taken into account in the model and their costs.
- **Clarity:** Clarity of a model is considered an essential feature, as without having a simple and comprehensible model, other efforts may become pointless.
- **Comparability:** Comparability principle involves a guideline that takes into account the compliance of applications and layouts among various models.
- **Systematic Design:** Systematic design principle postulates well-defined relationships among various models of distinct views such as organization, function and resource view. It is essential that each input and output of a process model should be designated within a corresponding data model and all relevant views should be taken into account.



Becker et.al (1995)

To sum up, Business Process Modeling plays a crucial role for Business Process Management. In the above paragraphs, the process of business process modeling was analyzed and guidelines of process modeling are initiated.

2.4 Literature on Performance Measurement

Organizations create their products or services by carrying out a number of core business processes. Due to the fact that those processes play an important role on the determination of final quality of the products and services and as well as on the customer satisfaction, it is deemed of essential importance for organizations to understand the significance of being process-oriented. Within the limits of Business Process Management, a great number of methods have emerged. BPM standardizes the business processes by utilizing of process models and continuously analyzes the optimization of these processes. As a prerequisite for managing, analyzing and optimizing the processes, the measurement of process attributes (e.g. costs, duration or customer satisfaction) is deemed imperative. Furthermore, it is deemed of crucial importance to possess information on the current status of business processes as well as the past performance in order to be able to handle them in an efficient way. This demands to identify measures or indicators for each procedure, which evaluates its performance. Comparing the values of indicators shows the progress of processes. In this section, I will give a short definition of the term "Performance" and present a synopsis of the topic of Performance Measurement and its relevant theories.

As part of business, performance can include two core dimensions: (1) **efficiency**; with regard to employing as few inputs as feasible to receive the outputs, and (2) **effectiveness**; so as to get the wanted outputs (Otley,2001). The goal of organizations is to accomplish its desired aim and objectives with out standing performance as well as the productiveness than its competitors so as to gain the most efficient performance(Neely, 1998). To evaluate the efficiency and effectiveness, a number of indicators should be established and measured. For instance, financial indicators have been conventionally used to measure those two dimensions (Neely, 1998).

Regarding the Performance Measurement definition, Anthony defined it as the procedure whereby the managers can make sure that organizational resources are acquired and employed effectively and efficiently so as to achieve the organization's goals (Anthony, 1965). Neely in 1998gave the Performance Measurement the following definition: A procedure that measures the efficiency and effectiveness of past actions by acquisition,

sorting, collation, interpretation, analysis, and dissemination of appropriate and relevant data. However, Moullin stated that the Neely's definition does not give a clear guidance to organizations about what it is really all about, due to the fact that defines Performance Measurement as a process (Moullin, 2003). Moullin defines Performance Measurement as an approach that assess the performance of organizations' management and their performance on delivering value to the customers (Moullin, 2003). In 2002Amaratungaand Bal dry argued that the measurement is a foundation for organizations to evaluate the progress about their predetermined targets. Moreover, it assists organizations to identify their strengths and weaknesses, and decides on their future initiatives, with the goal of goal of enhancing performance (Amaratunga& Baldry, 2002).

Taking into consideration all the above definitions, we can define Performance Measurement as a systematic approach for gathering, monitoring, controlling, analyzing and assessing the information with regard to corporation's activities to accomplish its desired outcomes. Integrating Performance Measurement in firms and organizations does not only help them enhance their performance, but also help them to ameliorate their productivity.

2.5 Remarks

BPM is a top priority by businesses in the fierce competition of today's economy and it's defined as a systematic and structured approach in order to analyze, supervise and enhance business processes to improve the quality of products and services. When BPM approach is applied to business processes, the BPM lifecycle can be adapted. The BPM Lifecycle introduced in this thesis contains the following phases: 1. Planning and Strategy 2. Analysis 3. Design and Modeling 4. Implementation. BPM is a spacious field that encompasses other approaches; such as Process Modeling, Process Optimization, and Performance Measurement have been emerged. Business Process Modeling is an inseparable part of Business Process Management. The procedure of business process modeling was described and guidelines of process modeling are introduced. The literature of Performance Measurement provides a multilateral approach which reflects two main aspects of effectiveness and efficiency in organizations. That help organizations to clarify their objectives and goals, communicate their strategy, and set up performance objectives.

3.Overview of case studies

Case study List

Number	Article	Author
1	How to Move from Paper to Impact in Business Process Management: The Journey of SAP	Corinne Reisert, Sarah Zelt, and Joerg Wacker
2	Developing and Implementing a Process-Performance Management System: Experiences from S-Y Systems Technologies Europe GmbH—A Global Automotive Supplier	Josef Blasini, Susanne Leist, and Werner Merkl
3	Establishment of a Central Process Governance Organization Combined with Operational Process Improvements	Christian Czarnecki
4	BPM Adoption and Business Transformation at Snaga, a Public Company: Critical Success Factors for Five Stages of BPM	Andrej Kovacˇicˇ, Gregor Hauc, Brina Buh, and Mojca Indihar S ˇtemberger
5	Enabling Flexibility of Business Processes Using Compliance Rules: The Case of Mobiliar	Thanh Tran Thi Kim, Erhard Weiss, Christoph Ruhsam, Christoph Czepa, Huy Tran, and Uwe Zdun
6	Comprehensive Business Process Management at Siemens: Implementing Business Process Excellence	Bartosz Wolin´ski and Saimir Bala
7	People-Centric, ICT-Enabled Process Innovations via Community, Public and Private Sector Partnership, and e-Leadership: The Case of the Dompe eHospital in Sri Lanka	Wasana Bandara, Rehan Syed,Bandula Ranathunga,and K.B. Sampath Kulathilaka
8	Fast Fish Eat Slow Fish: Business Transformation at Autogrill	Stijn Viaene and Joachim Van den Bergh
9	The NESTT: Rapid Process Redesign at Queensland University of Technology	Michael Rosemann
10	Kiss the Documents! How the City of Ghent Digitizes Its Service Processes	Amy Van Looy and Sabine Rotthier
11	Application of the Design Thinking Approach to Process Redesign at an Insurance Company in Brazil	Jose´ Ricardo Cereja, Flavia Maria Santoro, Elena Gorbacheva, and Martin Matzner
12	Collaborative BPM for Business Transformations in Telecommunications: The Case of “3”	Thomas Karle and Kurt Teichenthaler
13	Process Management in Construction: Expansion of the Bolzano Hospital	Elisa Marengo, Patrick Dallasega,Marco Montali, Werner Nutt,and Michael Reifer
14	Exposing Impediments to Insurance Claims Processing	Robert Andrews, Moe Wynn, Arthur H. M ter Hofstede, Jingxin Xu,Kylie Horton, Paul Taylor, and Sue Plunkett-Cole
15	Mining the Usability of Process-Oriented Business Software: The Case of the ARIS Designer of Software AG	Tom Thaler, Sabine Norek, Vittorio De Angelis, Dirk Maurer, Peter Fettke, and Peter Loos
16	Improving Patient Flows at St. Andrew’s War Memorial Hospital’s Emergency Department Through Process Mining.	Robert Andrews, Suriadi Suriadi, Moe Wynn, Arthur H.M. ter Hofstede, and Sean Rothwell
17	CrowdStrom: Analysis, Design, and Implementation of Processes for a Peer-to-Peer Service for Electric Vehicle Charging	Martin Matzner, Florian Plenter, Jan H. Betzing, Friedrich Chasin,Moritz von Hoffen, Matthias L€ochte, Sarah Pütz, and

		J€org Becker
18	Enabling Flexible Laboratory Processes: Designing the Laboratory Information System of the Future	Christoph Duelli, Robert Keller, JonasManderscheid, Andreas Manntz, Maximilian R€oglinger, and MarcoSchmidt
19	Managing Environmental Protection Processes via BPM at Deutsche Bahn .	Ingo Rau, Iris Rabener, Jürgen Neumann, and Svetlana Bloching
20	Hybrid Process Technologies in the Financial Sector: The Case of BRFkredit	Søren Debois, Thomas Hildebrandt,Morten Marquard, and Tijs Slaats
21	Business Process Management in the Manufacturing Industry: ERP Replacement and ISO 9001 Recertification Supported by the icebricks Method	J€org Becker, Nico Clever, JustusHoller, and Maria Neumann
22	Why Are Process Variants Important in Process Monitoring? The Case of Zalando SE	Matthias Schrepfer, Matthias Kunze,Gunnar Obst, and Juliane Siegeris
23	Adoption of RFID Technology: The Case of Adler—A European Fashion Retail Company	Roland Leitz, Andreas Solti,Alexander Weinhard, and JanMendling
24	Automate Does Not Always Mean Optimize: Case Study at a Logistics Company	Jan Suchy, Milan Suchy, MichalRosik, and Agnes Valkova
25	Integrate Your Partners into Your Business Processes Using Interactive Forms: The Case of Automotive Industry Company HEYCO	Bernhard Schindlbeck and PeterKleinschmidt
26	Leading 20,000+ Employees with a Process-Oriented Management System: Insights into Process Management at Lufthansa Technik Group.	Mirko Kloppenburg, JaninaKettenbohrer, Daniel Beimborn,and Michael B€ogle
27	“Simply Modeling”: BPM for Everybody-Recommendations from the Viral Adoption of BPM at 1&1	Florian Imgrund, Christian Janiesch,and Christoph Rosenkranz
28	Supporting Process Implementation with the Help of Tangible Process Models.	Thomas Russack and SusanneMenges
29	Business Process Modeling of a Quality System in aPetroleum Industry Company	John Krogstie, Merethe Heggset, andHarald Wesenberg
30	Business Process Management in German Institutions of Higher Education: The Case of Jade University of Applied Science	Jan Bührig, Thorsten Schoormann,and Ralf Knackstedt
31	Exploring the Influence of Organizational Culture on BPM Success: The Experience of the Pernambuco Court of Accounts	Carina Alves, Iveruska Jatoba´,George Valenc¸a, and Glo´ria Fraga

INTRODUCTION

At this section, I gathered information from the book “Business Process Management Cases” (Brocke&Mendling , 2017) about Business Project Management cases. The aim of this book is to increase knowledge exchange based on real-world BPM projects for fostering both BPM education and practice. The book provided 31 cases on how organization simplement business process management to accomplish excellent operational outcomes. Each of these case studies is sorted according to a uniform structure comprising the following parts: (1) Introduction, (2) Situation faced, (3) Action taken, (4) Results achieved and (5) Lessons learned. To better analyze the data and come up with safe results, I studied the 31 cases and created 31 tables, one for each case study; each table consisted of the following 9 categories: (1) General information, (2) Intention, (3) Core element, (4) Situation faced, (5) Life cycle, (6) Actions, (7) Model, (8) Results achieved and (9) Lessons learned.

1)How to Move from Paper to Impact in Business Process Management: The Journey of SAP

Introduction

SAP is a software market leader with 44 years of history and employs more than 77,000 employees in more than 130 countries. SAP's key message is that we can simplify everything. In 2008, SAP launched an initiative to transform R&D processes into more flexible and simple processes using BPM which significantly reduced BPM's role now includes:

- developing the SAP Process Map,
- the SAP Process Maturity Model,
- approaches to measuring performance.

Situation Faced

In order to produce innovative solutions faster, SAP began in 2008 to transform its research and development processes. One change it made was to change the cascading process it had until then because it had a lot of customer complaints and affected SAP numbers with the application a Lean Development Model based on more flexible practices to move away from complex and static project methods that delayed the whole process. The groups created were intended to deliver small sections of work every 2-4 weeks. This resulted in a continuous improvement in handling time, timely delivery, and the production capacity they acquired. When it saw that it had succeeded, it decided to extend this approach to all production units but found in front of it its employees' complaints of complex procedures. In essence, SAP came out profitable because it was intended to gain experience in transformation research and development to broaden the scope of the organization as a whole.

Action Taken

PCG is responsible for overseeing SAP's operations after deciding to enhance transformation. The SAP-owned PCG facilitates a direct link between PCG's portfolio and its corporate strategy. BPM's life cycle includes many phases which will be discussed below.

SAP Process Map

The process map typically results from the BPM process identification phase. SAP processes are closely linked to the corporate strategy and are the basis for external audits that are only for the good of the business in order to improve them. BPM processes are used for planning, reading, and managing processes. The SAP Process Map is a hierarchical synthesis consisting of multiple high-level processes and corresponding sub-processes 1, 2 and 3 which are perfectly connected to each other. If not done there will be a problem. Each process should serve a purpose and be constantly improved.

BPM Community: Central and Local Responsibilities

People and culture are key elements of BPM. The PCG managed by SAP Process Map provides templates that help you design, measure and streamline processes. Every business should control their processes. PCG helps these businesses and provides them with a solid relationship with BPM based on the aligned model of collaboration between process managers. PCG gives businesses some tools for successful organization such as Process Management Training, SAP Process Summit and SAP Process Excellence Award.

Continuous Process Improvement

The main goal of BPM in SAP is to continually improve processes. Any improvement can result from monitoring the BPM life cycle phases. Administrators are responsible for defining and defining process improvements. SAP while fixing is reusing existing enhancements. Actual activities involved can be numerous and varied, such as monitoring life cycle phases,

being strategic, being part of continuous improvement. Improvement is measured by PPIs including performance time, or customer satisfaction and cost per unit of production.

SAP Process Maturity Model

SAP uses its own process maturity model that has adapted it to the needs of the company and its business model and follows the concept of generic models. This model distinguishes four levels starting at level 0 and ending at level 4.

Performance Measurement

Process monitoring and control are critical phases of the BPM lifecycle and are Level 2 components. Level 2 measures the performance of the process based on the assumption that you can manage that you can measure. This is wrong because it is not can we measure basic PPIs and of course this whole question also raises some questions like what are the right clues? How and how often should they be measured? What is a reasonable sample size? SAP to facilitate the issue introduced 6 PPIs which are input, functions and output which have 2 subcategories each.

Improvement and Productivity Services and Strategic Projects

Above all else, PCG offers services to improve BPM processes that increase the effectiveness of individuals and businesses. Improving services allows teamwork, meaning that 2 employees can deliver a job together and then do it themselves. . Results are measured by internal customers to avoid misuse of services. Each employee would like to do their job and focus on basic tasks but poorly designed processes, lack of training and poor performance prevent them from doing so. For this reason PCG designed two Role Snapshot and Perfect Day at Work services.

Results Achieved

The unique combination of strategic initiatives based on corporate strategy has allowed PCG to simplify internal processes and increase overall productivity. With the implementation of SAP Process Map 626 employees can process a process and more than 1200 employees are enrolled in in-house training that helps them design and deploy processes in SAP. Today, 92% of all Level 3 is documented and published on SAP Process Map. One of the process managers specifically mentioned that we changed our daily work and the way we visualize processes for the better. The SAP Process Map essentially separates responsibilities across the organization, helps employees monitor the project and is a reference structure for many projects such as IT projects. Considering a sample of 100 projects, SAP has a 20: 1 success and satisfaction. of customers exceeding 75%, while processing time was reduced by 74%.

Lessons Learned

The BPM implementation has come a long way and it helps companies understand the work they are doing and we have now gone from paper to practice which could be done with 4 key factors (strategic alignment and support, establishing strong governance, implementation directory of services, experience).

SAP	
General information	• More than 44 years of innovation • Annual revenue of 20,793 billion euros • More than 77.000 employers in 130 countries • More than 300.000 customers in 190 countries
Intention	help organizations of all sizes and in all industries overcome the complexities that plague our businesses, our jobs and our lives → simplification of processes
Core element	Governance
Situation faced	• Replacement of complex and static project methods to more agile and simple ones • Stabilization of process infrastructure and process improvement culture

Life cycle	Process discovery
Actions	• SAP Process Map (management, core, support, overview) • BPM community strengthening (SAP Process Excellence Newsletter, Process Manager Information Sessions, Process Management Training, SAP Process Summit, SAP Process Excellence Award) • Continuous process improvement (can result from life cycle phases 2-6 or by strategic initiatives) • SAP Process Maturity Model • Performance measurement (input, operations, output) • Improvement of productivity services and strategic projects (Role Snapshot, Perfect day at work)
SAP Maturity model	1. The process is neither transparent nor managed 2. The process is transparent 3. The process is managed 4. The process is on a high level of optimization and is continuously improved
Results achieved	1. simplify internal processes 2. raise overall productivity → positive impact on corporate strategy
Lessons learned	1. BPM initiatives have moved from being an administrative burden to creating a real impact 2. the company's perceptions of BPM experts has improved significantly 3. there is a high demand for the improvement services offered by the PCG. 4. employees now request services or strive toward process improvement. Factors that contributed: 1. strategic alignment and top management support 2. strong governance 3. implementation of the PCG service catalog → increase of process maturity

2)Developing and Implementing a Process-Performance Management System: Experiences from S-Y Systems Technologies Europe GmbH—A Global Automotive Supplier

Introduction

Process Performance Management (PPM) has been around for a long time in many companies and it helps them track and manage business processes using Key Performance Indicators (KPIs). The problem is that PPM has long been applied to companies that now they face its challenges. Searching for and finding the right one is quite difficult. These indicators require a top-down process while most companies prefer the exact opposite. To adapt PPM to a company, it looks at the company's industry, its role, processes and services. This document deals with the development and implementation of a PPM system at a German car supplier SY Systems Technologies Europe. GmbH which is a joint venture between the two major companies Continental and Yazaki Europe Ltd. The company identifies and analyzes interactions between EEDS to optimize the needs of its customers and its products. In 2012, S-Y Systems conducted a project in collaboration with the University of Regensburg, which sought to control IT operating processes. The result was that the company implemented the PPM system which helped as we will see below to better control its processes.

Situation Faced

S-Y Systems is integrating new systems to strengthen its position despite being one of the market leaders. Innovations in the field of automotive information and energy management for EEDS systems underline the company's role as a systems integrator. You are also expanding to many European countries to better serve its clients, who succeeded in creating small teams that analyze the needs of some of the clients who work with them and adapt these ideas to the requirements of the clients. which can only be done by advanced design and improvement of the various processes. For the control it will use a PPM system which is necessary to identify possible areas of optimization. The initial reason for this was the problems that had arisen for some car maker orders, which could not be sent to the

intermediate system to convert, interpret, enrich and The most important of all was that the problem was not clear, they did not know where the mistake was made. more editing errors are found elsewhere. As a result, SY Systems has decided to monitor IT Operating Procedures (EDI) and has started a process measurement project. Therefore, adopting EDI helps companies to respond quickly, achieve cost efficiency, meet a demand of customer.

Action Taken

In 2012 a student competition was held consisting of 2 groups of 2 persons. The aim of the project was to develop a PPM system for the applied ITIL and EDI processes. The result was the success of the project for both processes, however our article talks about the EDI process.

The Approach to Developing and Implementing a PPM System

For a successful implementation of a PPM system, a structured top-down process must be implemented to ensure that the system follows all the necessary aspects that are necessary. That is why a seven-step PPM approach was developed.

Step 1: Every company must have a specific goal because without it the original target can be lost and the insignificant indicators to take the place of the key indicators in the system.

Step 2: Ensuring the stability of the database requires gathering all important company information

Step 3: This step is a complete and current model of the process chosen to monitor and improve performance. Models must be checked for their timeliness and enriched with appropriate information.

Step 4: This step defines the purpose of the process which is either general or qualitative or specific and quantitative

Step 5: Determine the critical success factors that determine the dimensions of the process KPIs

Step 6: In this step which is the most complicated, identify the appropriate procedures. By following the steps above we ensure that we have found the appropriate KPI indicators and the information they need. Such information can be its source, its limits, who is responsible for monitoring it. There is of course the risk of KPIs being selected. that interfere with each other and prevent them from being properly monitored.

Step 7: In this step the text talks about the implementation of organizational integration so that it must be ensured that the information required reaches the members responsible for monitoring them.

Application of the Approach at S-Y Systems

The PPM approach has 7 steps which will be outlined below

Step 1: The purpose of the project is to show that the problems that arise are not due to the SY system but a reason for the inconsistency of the processes.

Step 2: Ensuring a consistent database contains all the information that is important to the company and is needed to limit the huge number of potential KPIs. SY Systems puts a great deal of emphasis on customer satisfaction and strives to produce products with zero defects to deliver the best quality at the lowest price and keep its customers happy.Another important factor is the quick response the company has to the problems to its customers

Step 3: This step selects and models the processes from which the process map consists of four basic EDI processes spanning three types of companies. The "connection creation" process that creates a reliable connection to the IT systems is the only of the four EDI processes performed only once for each partner. Once the connection is tested, files can be exchanged between SY Systems and its customers, and the last two main processes are "SAP

log file", which includes editing of EDI inbox and "SAP file upload", which includes preparing and sending an outgoing EDI file.

Step 4: Define the Purpose of the Process: Each process must have its own purpose and be analyzed. The quantitative objective of the "SAP log file" is to "process fast without error depending on customer needs"

Step 5: Critical success factors of the process were identified as CSFs of the process. S-Y focused mainly on debugging to improve the quality of its products. But mistakes that are not her own but that of her partners had to be identified and reported to their company

Step 6: Here's how to identify KPIs. After completing the previous steps, you should find KPIs related to quality. Since the processes were executed automatically, their monitoring had to focus on where the bugs occurred and on how to resolve them.

Step 7: Applying Organizational Integration: This step requires detailed organizational information and the power to impose organizational changes on the company.

Results Achieved

To fully understand PPM they need a graphical representation in which each step of the approach uses the information collected in the previous steps to be consistent. PPM consists of two levels as usual. For example, to see the errors of a set of KPIs they will see them when a light on our "Check the name of the EDI file" lights up only if there is a receive rule otherwise it will show an error.

Lessons Learned

As the case study can see, many companies are having trouble monitoring their system as they may choose inappropriate quality-related KPIs and thus set unnecessary metrics, they do not work 24/7 or they may be on holiday. For example in Turkey on December 25th

employees work so the PPM system on the day of opening would give very high performance positive results but to distort the KPI indicators when comparing performance between countries.

PPM (case of S-Y systems)	
General information (S-Y systems)	● Company related to associated components for automotive electronic distribution systems ● Founded in 2001 ● 280 employees ● Turnover of 420 million euros ● Goal: excellent customer service
Intention (PPM)	monitor and manage business processes using process-oriented key performance indicators
Core element	Governance
Situation faced	Occurring errors from the first steps of data processing errors (e.g., name, format, structure, content) without being able to determine the following: • exact allocation of errors in the process • the reasons for the errors • their origin →challenge: investigation of the processing errors
Life cycle	process monitoring and controlling
Actions	● student seminars over 4 months ● two groups with a leading phd student ● goal: development of a PPM system
PPM developement model	1. Define the goal of the PPM project 2. Ensure a solid basis of information 3. Select and model the process 4. Determine the goal of the process 5. Identify the process's critical success factors 6. Identify process KPIs 7. Implement organizational integration
Results achieved	1. Crucial structured, top-down-oriented development procedure

	2. Monitored Indications about the appropriate, goal-oriented, and useful KPIs of the processes
Lessons learned	1. There is a clear risk on loss of focus on the intrinsically relevant processes of a PPM project 2. Reveal of the tasks in the processes → closure of the initial goal of the project This PPM approach advocates: 1. the concentration on the overall goal 2. the development of a PPM system along with the relevant KPIs

3)Establishment of a Central Process Governance Organization Combined with Operational Process Improvements

Introduction

The telecommunications industry is constantly evolving and this has resulted in many new players having entered the field and upgraded it. the text by ME Telco1 which despite having a monopoly in the telecommunications market now faces competition and the need for continuous innovation. So began a project related to BPM problems and countermeasures. In addition, a team was established that would be responsible for the proper functioning of the procedures. The results were to reduce the time of incident management from 13 days to about 4 days.

Situation Faced

The author focuses on ME Telco1, which offers telecommunications and internet services to customers in the Middle East, Asia and Africa. The company retained its monopoly but when IP-based companies emerged competition began. Research showed that customer satisfaction was diminishing and competition and continuous innovation from competitors led to a struggle to market new products and support them. Other problems he faced were processing times to respond to customer messages and conclusions that did not meet the company's goals. ME Telco launched a transformation program aimed at improving competitive advantage, customer satisfaction and internal efficiency which were various initiatives that were managed as separate projects and controlled by an individual from the board.For better process management a high-level analysis called BPM Diagnosis was performed - to identify the problems, its results helped clarify the situation that company.

Action Taken

This section describes the actions taken based on customer feedback. The artifacts explained below relate to design decisions based on specific practical requirements. The 6 key elements of BPM were made to facilitate BPM's common understanding and life cycle. The

team set up at this stage consisted of board members and selected senior executives. workers and experts. Finally the project was divided into 3 phases, which started high-level diagnostic study, continued with the detailed design and implementation of the specified countermeasures and finally the results were monitored. BPMdiagnostics Phase 1 was used to evaluate the existing situation. This analysis covered the responsibilities of BPM, the methods and tools used in BPM. The work on this analysis took 4 weeks. In Phase 2 they focused on 3 issues, depending on Phase 1 findings:

• The development and implementation of a central BPM department in which an organizational entity responsible for managing business processes should be created. The appropriate tools selected for its implementation were staffing with appropriate people and on-the-job training. developed policies, standards and tools.

• The development and implementation of a framework of procedures based on the eTOM Reference Model, adapted to the specific requirements of ME Telco. Its implementation includes approval by the Board, communication with all employees.

• Lastly, improving the procedures to which it also belongs and the incident management process. After the process analysis, the target process was designed based on the eTOM model.

Continuing in Phase 2, an important solution was to break up into four WPs that had some competence. A covered the development and implementation of the BPM department, B included detailed case management planning, C included the implementation of this targeted process and finally D included continuous project management and communication.All packages lasted 4 months and their results were divided into 3 milestones which were:

1. The BPM process has been completed

2. The process design was completed

3. The implementation of the procedure was completed

These milestones were presented to the company's executive committee and employees received messages about their progress. The manager was also responsible for each department and its progress. 5 processes were used to better implement the project, divided into sectors and which are:

• Customer-centric sector: Includes main activities such as product sales and service

• Technology: It covers the development, deployment, operation and maintenance of network infrastructure.

• Product Sector: It covers product development based on services provided by the technology sector.

• Customer Sector: Focuses on attracting customers to buy products.

• Sector Support: It involves dealing with company support such as financing.

These processes were then described in detail. For example, the customer-centric domain also includes the payment process because you require it to implement the central part of the BPM. The third step in Phase 2 is the incident management process which starts with managing the contacts and then being analyzed and resolved. The situation was analyzed and the findings substantiated. The solution to this problem for the whole project was:

• Identification and definition of relevant stakeholders in ME Telco: Reference models were recorded in the existing organizational structure to identify relevant stakeholders.

• Customer specific requirements identified through surveys that need to be separated and resolved

• Design of models according to the 1st draft: These models were grouped according to their objects and given to external experts.

• Surveys with some stakeholders to find out the specific requirements these stakeholders have

• Finally, acceptance of models including management and staff acceptance.

The results were regularly posted in a newsletter to all employees and to those interested.

Results Achieved

They have created a central company-wide BPM that can be described both qualitatively and quantitatively. From a qualitative point of view, three main results were achieved. First they created a central BPM department, then they introduced a company-wide process framework and finally improved the management process.The results are:

• 18 stakeholder groups participated in design workshops

• 170 employees received training on the new department and the BPM process

• 30 interviews and site visits were conducted during the analysis of the results

• 120 employees received operational training for improved management

Improving the incident management process has led to improved efficiency and effectiveness. The indicators that measure this performance are analytical time, reset rate, working time, and number of events. For example, assuming the analytical time was averaged term 13.0 days during the 2 months before the application and 3.6 days during the 2 months after the application. 13 days and 2976 hours of work per week. The new rate will

be 20% significantly improved due to the reduction of the break time of 3.6 days and 1815 hours of work per week.

Lessons Learned

According to the BPM life cycle model proposed, the case describes a complete execution of this life cycle. The process framework provided a state-of-the-art architecture for the identification and analysis steps. The incident management process was selected for a detailed analysis such as analysis, redesign and implementation at the business level. BPM also facilitated communication between people and stakeholders. At the operational level, the implementation of the process was supported by changes to application systems . Tracking performance improvements provides a linkbetween planning the improvement strategy and executing the process at the operational level. Generally we could say that from this chapter they learned that the content of the process is a major success factor even if it is at an early stage requires consideration of the various BPM components and that BPM methods are important to improve a business process because without them they would not have the improved performance.

ME Telco	
General information	● telecommunication company ● 290 employees were trained ● 8 monthsdutation
Intention	Increase the competitive advantage, customer satisfaction, and operational efficiency of the telecommunications industry.
Core element	Governance
Situation faced	● Major problems were silo-oriented process management and missing cross-functional transparency ● Process improvements were not consistently planned and aligned with corporate targets ● Measurable inefficiencies were observed on an operational level, e.g., high lead times and reassignment rates of the incident management process
Life cycle	process redesign

actions	1. BPM Diagnostics 2. Design, Implementation and Improvement • Development and implementation of a central BPM department • Development and implementation of a company-wide process framework • Improvement of a selected process 3. Monitoring and Hand-over
Target model	● Identify and nominate relevant stakeholders in ME Telco ● Nominated stakeholders provide the specific requirements ● Hold feedback workshops with nominated stakeholders ● Finalize and formally accept target models
Results achieved	From a quantitative perspective ● Establishment of a central BPM department ● Formation of a company-wide process framework ● Improvement of the incident management process From a humanitarian perspective ● Identification of 18 stakeholder groups which wereinvolved in design workshops during the customization of the process framework. ● 170 employees received training on the new BPM department and process framework. ● 30 interviews and site visits were conducted during the as-is analysis of the incident management process. ● 120 employees received an operational training on the improved incident management process. ● 8 employees in the new BPM department received a detailed off-site BPM
Lessons learned	1. Process content is an important success factor in a BPM implementation. 2. Process ownership requires consideration of the various BPM elements. 3. Early involvement of stakeholders from top management to the

	operational level is essential for successful implementation. 4. Customization of reference models requires a transparent approach to decision making. 5. General BPM governance and methods are important for an operational process improvement.

4)BPM Adoption and Business Transformation at Snaga, a Public Company: Critical Success Factors for Five Stages of BPM

Introduction

To adopt a company BPM requires a lot of effort, time and resources as it is a complicated and time consuming process and very few have done so far. The text is by way of example Snaga which is a Slovenian public company that manages waste. In 2005, Snaga executives recognized that the company's business was inadequate and that some changes were needed. For the next 7 years, the company transformed its business with the help of BPM, whose adoption brought significant benefits. to the company and has allowed it to maintain its competitive edge.

Situation Faced

The problem was that existing business before adopting BPM had old methods and as a result did all the manual work in Microsoft Excel and Word. Also, the acquisition of employee data was time-consuming. All of this created delays that should not have been created. Another problem was the strict legislation that dictated the development of waste treatment technologies. a waste treatment center that started in 2003 with project planning and was completed by the end of 2016. I was aware of the above problems and the executives knew that the As a business the company was inadequate and needed changes. So they decided to redesign all processes and adopt other BPM practices. The results that the company expects are to improve its efficiency while reducing costs and time, increasing productivity and increasing services.

Action Taken

Snaga has completely transformed its business operations and adopted BPM using BTA (iterative business process-focused methodology) and external consulting professional

guidance. The design, development and implementation of BTA can be divided into some iterative phases. to facilitate its implementation:

• Strategic planning of business transformation

• Restructuring of business processes and development of information architecture (IA)

• Development and implementation of the information system (IS).

All these results are first recorded according to the rules of the particular model and then used in subsequent phases to keep the process on track. During this phase of the BTA, IA is also defined which refers to the design and construction of an information plan that naturally covers the rules of business processes and meets the needs of business processes and decision making. transformation and development phase of IA is the business process model, a global data model and technological / organizational foundations. After performing specific steps for IA we have the end results which is a database and application solutions developed for that particular application area or selected business process.In the example of the text the company had to take some steps to adopt BPM

1. The first is to realize that there were problems with the processes and opportunities of the organization that existed until then to improve them.

2. The second step is the prerequisite for this decision to adopt BPM as well as the awareness and understanding of BPM.

3. In the third step, the CEO of the company has now appointed a project team consisting of employees with the knowledge and experience to contribute to the successful adoption of BPM. The first work he did with this team was to model, analyze and redesign business processes. This step also includes, of course, the proper training of the staff to perform their duties.

4. In the fourth step we set up the office that would be responsible for the smooth running of the BPM managed by the processor who along with some other executives redesigned the company's strategy and eventually managed to pass on the BPM goal to the employees and because it's important to the company and themselves.

Results Achieved

To determine if BPM was successful, 2 of the 10 maturity models selected the process performance index (PPI) and the BPO maturity. These 2 indicators were selected because they have several common elements. In the text example, the PPI is 47 so the company is in phase 3 of the management maturity process. This questionnaire gives Snaga a grade of 4.6 essentially the highest level of maturity defined as complete. So we conclude that the adoption of BPM has brought significant benefits to the company, which with the establishment of a BPM office has made the transition from one functional to another process with increased customer focus. The BPM office is responsible for assigning tasks to process operators and other business employees , who accepted BPM as a standard activity in a consistent way, helped the company gain a good market view and managed to make a 50% reduction in complaints they had until then , increased competitiveness and improved business value for the company.

Lessons Learned

After some interviews with CEOs and process owners and the general experience that some stages have been identified for adopting BMP. In the first stage, he talks about empowering employees, that is, when the company sets great goals, its employees need to have the appropriate knowledge. For the next stage important areas are the support of top management as well as the award for become the champion of the project and the business guides that may be some new challenges, some need to replace an outdated solution, or the need to establish some technical or quality control to improve customer satisfaction. Stage 3 defines the goals, purpose and plan of the BPM which must be clear and understandable and known to everyone before the project begins. External consultants will certainly be needed to help the project succeed. With these processes the organization has avoided many

problems during the project such as employee resistance and as we know these types of projects are mainly based to the employees who need to be properly trained to be able to adopt the project. In the fourth stage, he talks about the support from top management, the good communication that must be there and the tion of external symvoulon.Sto last step mention humans, the identification of KPI and their assignment to the appropriate people.

Snaga	
General information	● Public company that provides services to 1 third of the Slovenian population ● 500 workers ● In 2015 it collected more than 130,000 tons of waste, of which 95% is processed, while the rest is disposed of
Intention	transformation of the organization into a process-oriented organization
Core element	Governance
Situation faced	• existing business operations weredisorganized • unnecessary duplication of work and excessive delays • new challenges in waste management • new legislation dictated the development of waste-processing technologies
Life cycle	process monitoring and controlling
Actions	● Planning for strategic business transformation ● Business process restructuring and information architecture development ● Information system development and implementation in six interdependent projects
BPM adoption model	● Awareness of process problems and opportunities ● Decision on BPM adoption ● BPM education and training; BP modeling, analysis and redesign ● Setting up the BPM office; Defining the strategy and a plan for its execution
Results achieved	The company gained a good overview of its business processes and the deficiencies of the processes were exposed and eliminated, which contributed to an increase in customer and employee satisfaction, a 50% reduction in complaints, increased price competitiveness, and the company's improved business value
Lessons learned	● New challenges in waste management and new legislation that dictates the development of waste-processing technologies, as waste disposal without

	processing will not be possible in the future ● Need for replacement outdated and inadequate IT solutions and systems ● Need for establishment of technical and quality control over business operations in order to enhance customer satisfaction through faster and cheaper provision of services

5)Enabling Flexibility of Business Processes Using Compliance Rules: The Case of Mobiliar

Introduction

Insurance case work can follow established procedures only to a certain degree, as the work depends upon experienced knowledge workers who decide the best solutions for their clients. An insurance document issued by Die Mobiliar, the oldest private insurance company in Switzerland, is not only a piece of paper; it serves as a business card, representing the company to its customers. Die Mobiliar uses the Papyrus Communication and Process Platformas the basis for its customized "Mobiliar Korrespondenz System" (MKS), with full functionality for online interactive business document production (ISIS Papyrus).

To produce quality documents in such a knowledge-intensive environment, business users of Die Mobiliar were guided by a wizard application that enabled them to compose insurance documents from predefined building blocks in a series of pre-defined steps. As these steps were hardcoded into the wizard application, the processes could not adapt quickly enough to accommodate new insurance products and associated documentation. Rapidly changing insurance markets produce new types of documents daily, so business users must react flexibly to client requests.

Situation Faced

MKS is built on the Adaptive Case Management (ACM) and Correspondence Solution of the Papyrus platform. While the Correspondence Solution handles the design and content of documents, the ACM solution's process modeling and execution capabilities manage the processes involved in document generation. ACM is designed for customer-oriented work driven by goals contained in a case that allows the insurance clerks to choose the appropriate actions from a context-sensitive set of ad hoc tasks with needed data and content to fulfill the related goal.

MKS enables clerks to generate documents interactively based on wizard process templates and to retrieve data dynamically from various business systems. The wizard is an ACM case that defines processes comprised of interactive user steps to be executed by the clerks. The wizard steps executed by clerks at runtime are prepared by business administrators as templates and stored in a template library at design time. The processes are defined with an editor that has full functionality to edit, visualize, and simulate the execution of wizards before they are released into production. In order to support flexibility at runtime, this challenge is addressed by applying consistency checking methods in combination with compliance rules, as discussed in the next section.

Action Taken

The new approach introduces a generically applicable consistency-checking method to enable a more flexible execution of document-creation wizards.

In the original operating principle of MKS, business administrators defined a wizard process template at design time, which was instantiated by clerks for execution at runtime. Clerks strictly followed the steps predefined in the wizard to create a document, but because the system did not allow clerks to adapt the process at runtime, they could not react to unforeseen situations within an insurance case.

In the MKS extended by the consistency-checking system approach, a wizard ACM case template is assembled at design time from goals that are achieved through predefined sub-processes and/or individual ad hoc tasks. Each sub-process is attached to the goal and combines the necessary tasks in a particular sequence. The quality of case templates is ensured by means of model-checking before the templates are released. At runtime, the set of compliance rules assigned to the case checks the execution of case elements—goal instances, process instances, task instances, and ad hoc actions—on the fly. A document is finished when all goals of a wizard are reached.

Design of Compliance-Rules-Enabled Wizards

The original MKS wizard process, can be divided into beginning, middle, and end parts of the process. The beginning part of the process retrieves the client's personal data and selects an insurance product. The end part defines the document-delivery channel, while the middle part is comprised of the steps that are necessary for the specific insurance case. The system's analysis of the original wizard processes led to a simplified model with a goal-driven structure where numerous processes share the same beginning and ending parts, but the middle part of each process is distinct from the others, although they might have tasks in common.

Constraint Definitions Using Compliance Rules

In order to govern the middle part of a wizard process, state-based and databased rules are been used. State-based rules define the sequences of tasks based on their states, such as "started," "finished," and "running". Data-based rules enable business users to define task dependencies that are related to data conditions. State-based and data-based rules can be combined to express a compliance requirement.

In unforeseen circumstances, the underlying data models might not provide access to critical data. In order to support flexibility in such situations without the need for explicit data definitions by IT, business users can check conditions manually using voting tasks that are guarded by compliance rules. Alternatively, the business user can define the checklist at runtime to adapt even more dynamically to the current situation.

The tasks of the middle part are ad hoc tasks selected by the clerks at runtime. Each of these tasks can be added to the case when the clerk sees the need to do so based on the case's content or context. The tasks' order of execution is not predetermined but is constrained by rules. A User Trained Agent (UTA) implemented in the Papyrus ACM system further assists the clerk in new situations by suggesting best next actions that were learned earlier from similar situations faced by other users.

An ACM wizard case is not driven by predetermined steps as it was before the redesign, but by goals that are fulfilled by the clerk. The First Core Goal holds the beginning part of the process, which is configured as a sub-process for retrieving insurance customer data from the database. The Last Core Goal contains the ending part of the wizard process for choosing the channel by which the document will be delivered to the customer. The tasks of the middle part are not predefined in the wizard template but are added by the business user as necessary at runtime to address the specific customer situation. The task execution of the middle part is controlled by three compliance rules, defined and composed in natural language by business administrators using the Papyrus rule editor. The compliance rules can control ad hoc tasks added at runtime when business compliance requirements demand it.

Results Achieved

The ACM technology used to build the wizard processes supports the definition of tasks to be performed by business staff at design time and their selective application by knowledge workers at runtime so Die Mobiliar can react quickly to new business requirements without involving IT. The processes can be defined directly by Die Mobiliar's business administrators using a process editor built on the Papyrus platform.

MKS's ability to edit wizard templates at any time enables Die Mobiliar to define new document and wizard templates within the boundaries imposed by the predefined processes. The process management in ACM is highly flexible, as it supports both automatic and ad hoc actions allowing business users to adapt their insurance processes, an advantage from which the whole insurance industry can benefit.

Lessons Learned

The trade-off between comprehensibility and flexibility in business process modeling has been addressed by both academia and industry, and declarative and imperative models have been studied to improve the flexibility of process models. To address this challenge, a theoretical approach was introduced and its successful application in the hybrid declarative-imperative modeling and enactment of a business process.

Rigid process modeling is not suitable for highly dynamic business domains, like the insurance industry, that are moving into the digital era. Instead, a hybrid of declarative and imperative modeling is best suited to such domains. This approach provides a maximum of flexibility within mandated constraints, enabling businesses to adapt to changing market requirements with minimal involvement by IT departments. In order to set expectations properly, the use of the two modeling types should be transparent to business users. The adoption of the new approach happens gradually to cope with business considerations like the integration of compliance checking into Die Mobiliar's production system.

MKS	
General information	● Oldest private insurance organization in Switzerland ● offers a full range of insurance and pension products and services ● approximately 1.7 million customers ● Rich in content documents that also serve as business cards
Intention	help organizations of all sizes and in all industries overcome the complexities that plague our businesses, our jobs and our lives simplification of processes
Core element	Governance
Situation faced	● Production of insurance documents depends mostly on experienced knowledge and less on established procedures ● The company was guided by a wizard application's hardcoded steps and the processes could not adapt quickly to the new insurance products and documentation ● Full automation of the processes possible but would hinder innovation and business agility
Life cycle	process redesign
Actions	● Papyrus Communication and Process Platform as a basis ● Construction of "Mobiliar Korrespondenz System" (MKS) (combination of business compliance rules with process redesign)
MKS model	1. retrieval of the client's personal data 2. selection an insurance product 3. Process of the necessary steps for that specific insurance case 4. definition of the document-delivery channel

	For the case of study: the original wizard processes are transformed into flexible processes with a goal-driven structure
Results achieved	1. well documented and provably compliant company management 2. flexible response to each client's needs within the defined boundaries of the compliance rules -> better customer experience -> adaptation of the insurance processes -> reduction of maintenance efforts
Lessons learned	1. a hybrid of declarative and imperative modeling is best suited for highly dynamic business domains instead of a rigid process modeling 2. Smooth adaptation to changing market requirements with minimal involvement by IT departments 3. the use of the two modeling types should be transparent to business users for clear assortment of expectations 4. The adoption of the new approach happens gradually to cope with business considerations

6)Comprehensive Business Process Management at Siemens: Implementing Business Process Excellence

Introduction

Siemens is a global powerhouse that focuses on the areas of electrification, automation and digitization. It is one of the world's largest producers of energy-efficient and resource-saving technologies. Such a complex structure could easily result in the misalignment of knowledge about the overall business process and consequent difficulties in managing the department-specific processes.

Departments were allowed a certain degree of freedom in pursuing their goals without centralized control. This approach reduced inter-departmental coordination and created differing views and specializations of the overall meta-process on the company level.

The company's top management made a first step toward increasing the synergy among the units by focusing on improving three areas: the effectiveness of structures and processes in the organization itself, the change management culture and pro activity, and collaboration among the businesses using best practices on sharing and innovation, process transparency, and BPM competencies that are centralized.

Situation Faced

At Siemens Poland, as well as in the global Siemens organization, the number of divisions changed from four sectors to nine divisions. This change decentralized expertise and created misalignment in how the departments pursued their goals. As a result, every sector was managing its processes according to the local business's specifications and needs, which made the comprehensive process management approach challenging. In addition, the processes were stored in various conventions and were disconnected. As a consequence, employees were still using various conventions to communicate their processes, and the company was characterized by process-aware "islands" that were surrounded by organizational structures that had no vision of the processes in which they were involved.

Siemens introduced a global BPM policy, to increase effectiveness and efficiency across all of the company's business processes while standardizing them and aligning them with its goals. Therefore, the processes had to be defined and their performance measured and improved incrementally.

The goal of the BPM initiative was to make the employees aware that they were part of a process; to evaluate and improve the performance of the processes; to improve process transparency, compliance, cooperation; and to identify areas where the processes could be automated.

Action Taken

Siemens implemented a formalized process policy. As a first step, the Business Process Excellence (BPE) regulation was introduced. It formulated the Siemens Processes for Excellence (SIPEX) process standards, which replaced the previous processes base, referred to as Reference Process House (RPH). At the same time, process roles (sponsor, owner, and manager) and corporate tools with which to visualize the processes, such as ARIS, were introduced.

In the Polish organization, the program was formulated as a vehicle with which to implement the process organization. The goal of the initiative, which was referred to internally as "Streamlining business processes," included chief financial officers (CFOs) as process sponsors and the head of the business process management team as the program manager.

Requirements of the BPM Policy

The BPM policy, referred to as BPM@Siemens, was developed from the previous Siemens Process Framework (SPF), which used RPH as a model, and is based on three principles:

Simplification: reducing organizational complexity for process management.

Usability: improving the structure of available data.

Transparency: well-defined and well-executed processes.

The standardization of processes is an important success factor. The policy applies to all Siemens organizational units worldwide and sets a company-wide framework for BPM at Siemens as a minimum standard. The new BPM policy focused on aligning processes on the business, operational, management, and support process levels in order to meet the needs of customers, employees, and suppliers. Moreover, to create value the focus was on: excellent quality, short development cycle, low non-conformance costs, effective communication, efficient deployment of employees and a culture of continuous improvement. This regulation is binding for all of Siemens' units.

Every high-priority process was assigned a process sponsor, an owner, and a dedicated project team of business representatives and a process consultant. The project had a clearly defined goal, a scope, and a timeline that was aligned with the master BPE implementation program schedule.

Implementing the BPM Initiative

To improve the quality of the company's processes, standardized processes were adopted, that all employees can use while still providing transparency and relatedness across projects. However, before the standardization could take place, processes had to be identified. To address this task, Siemens took the BPM lifecycle model as a reference. The BPM lifecycle consists of an initial phase of process identification, where the process boundaries are defined, and then iterates the process through five activities in a loop that iteratively improves the process. The five-step process are: Identification of the Business Process Owner, Nominate a Sponsor to the Process, Assign Process Owners, Conduct Workshops and Systematically Refine the Process.

At the first stage, workshops were held throughout the company every 2 days. Then their frequency became weekly or monthly based on the progress of the identification phase and the affected employees' learning curve.

Practical changes took place for project managers that had often been given unrealistic goals. Also, involvement offinancial controllers and buyers, giving their perspectives on the process. Furthermore, resistance to changing employees habits was encountered.

Methods and Tools for Business Process Excellence

Once the processes were defined, designed, improved, and documented, existing proprietary tools and frameworks to implement the solution were used:

Project Business@Siemens: supports project management,

Quality Management: implementing quality management,

Operational Excellence: offers methods and processes that address function-specific areas,

Process and Production Consulting: enables processes successfully and sustainably,

top +: provides the framework for business excellence and supports cutting costs, increasing revenue, and optimizing assets

Business Process Analysis and Optimization: standard tools for process documentation, modeling, and publication, such as ARIS and the internal tool Dynamic ProcessWorld (DPW).

Results Achieved

Three areas were improved by implementing the corporate BPM policy.

Simplification: The number of resource roles was reduced from eight to three. The process sponsor, is in charge of defining the process portfolio, appointing the process owner, and promoting the process management topic. The process owner, is responsible for handling a process. The process manager, selected by the process owner as an expert in the process, supports the process owner, and is the primary contact for process users.

Usability: Usability was improved in terms of visualization of the processes and increases in the supporting tools' ease of use.

Clarity: The standardization of processes on the firm level brought improvements in terms of clarity.

At present, on the corporate level Business Excellence is a core element of Siemens—Vision 2020. It is embedded into the Corporate Technology structure, which enables it be the part of innovative products and management standards. It is also a key lever that empowers the company's lasting business success and strengthens its competitiveness in the market.

Lessons Learned

Four primary lessons were learned from the program at Siemens:

- Complexity in many dimensions (number of processes, number of roles, number of formal documents, and circulars) is not supportive of effective process management.

- Having a strong, dedicated process sponsor is one of the most important keys to success.

- The entire organization will not appreciate the work at the beginning, but they will if one does her or his best to understand their businesses and support their efforts.

- Be flexible: Failure to align the businesses with the corporate recommendations will lead to lack of appreciation and cooperation.

Siemens	
General information	● Focus on electrification, automation and digitization areas ● 413.000 employees at 1640 locations and 176 facilities ● Worldwide production of energy-efficient and resource-saving technologies ● Goals related to Power sources, energy management, technologies, services etc.
Intention	help organizations of all sizes and in all industries overcome the complexities that plague our businesses, our jobs and our lives simplification of processes
Core element	Strategic alignment
Situation faced	● Complex world-wide organization divided into different businesses with certain autonomy supported by the central departments ● The implementation of standard business process management led to an assortment of the businesses into 4 sectors ● The process management according to the local business specifics and needs made the comprehensive management challenging ● Lack of support on corporate initiatives that were intended to address the effectiveness and efficiency of business processes
Life cycle	process redesign
Actions	implementation a formalized process policy 1. introduction of the Business Process Excellence regulation (BPE) (formulation of the Siemens Processes for Excellence process standards) 2. introduction of process roles and corporate tool for process visualization
BPM policy model	1. Identify Business Process Owners 2. Nominate Process Sponsors 3. Assign Process Owners 4. Conduct Workshops 5. Systematically Refine the Process Practical changes needed for this policy, included the involvement of the project managers, the financial controllers and the buyers as well as the acceptance of the change
Results achieved	Improvement in the following areas:

	● Simplification (increased flexibility, reduced manual conventions, and reduced number of processes) ● Usability (enhanced process visualization, graphical navigation, better clarification and retrieval of information regarding the process) ● Clarity (reduction on the numbers of regulating circulars and control requirements, clear designation and responsibilities of process owners) Establishment of a knowledge center that bundles all the essential tools for the businesses' operational improvement
Lessons learned	1. Effective process management is restrained by the complexity in many dimensions 2. It is important to have a strong and dedicated process sponsor 3. Underappreciation of the work at the beginning, but appreciation afterwards if one does her or his best to understand their businesses and support their efforts 4. Failure to align the businesses with the corporate recommendations will lead to lack of appreciation and cooperation

7) People-Centric, ICT-Enabled Process Innovations via Community,Public and Private Sector Partnership, and e-Leadership: The Case of the Dompe eHospital in Sri Lanka

Introduction

Health sector reforms, especially technology-supported process improvements in developing nations, are known to be a challenge because of resistance that emerges from such issues as lack of required capabilities resulting from technology phobia among key stakeholders, fear of losing control, and even fear of job loss.

The call for improvement came from within the hospital, and it continued because of a collection of critical factors, all lining up, each making its own significant contribution.

The case takes place at Dompe Hospital, in Sri Lanka. Sri Lanka has had considerable success in health care delivery, but the hospital sector as a whole has failed to evolve as customer-centric service providers. Weak management practices and poor staff attitude, Long queues, confusing instructions, and unfriendly staff are common and accepted features in almost all public hospitals.

This case is the story of how Dompe changed that image and became an example of patient-centric public health service provisioning in Sri Lanka. This change was achieved through a multi-stakeholder-engaged reform effort that resulted in improvements in the use of physical and personnel resources and ICT-enabled process improvements.

Situation Faced

This case study is a unique example of a people-centric ICT-enabled BPM effort that overcame many challenges through steady championship fuelled by a multi-sectorial support network (local community, government agencies, private sector and institutes of higher education). Driven by a desire to make a difference, a weakly reputed regional hospital in Sri Lanka with chaotic, mundane, manual processes became a landmark success

in its service efficiency and effectiveness via staged continuous improvements, collaborative ideation, creative resource utilization, and effective management of its “people” aspects.

Action Taken

The project took a multi-staged people-centric approach. Major attitudinal change efforts with staff helped to build a unified internal workforce that was empowered to understand the patients’ needs. The hospital’s physical environment was transformed into a peaceful, pleasant atmosphere that was free of chaos. The entire patient-care-process was mapped, analyzed, and transformed with IT enabled process improvements.

A new patient records management system and a mobile-channeling system was implemented to eliminate long queues and increase the quality of patient care. Continued reviews and improvements are key in this case, as the vision to make a difference does not end with a single initiative.

Changes in the Physical Environmental

The process model were documented and changes made to improve the hospital’s physical space. The costs for the improvements in the physical infrastructure were paid from the local industrial organization donations. The ongoing relationships between the hospital staff and resident community members played a key role in winning these sponsorships.

Patient-Centric ICT-Enabled Processes for Delivery of Medical Services

The Hospital Health Information Management System (HHIMS) was introduced in Sri Lanka during the 2004 tsunami-recovery period to support patient records management, and the software was licensed for open-source use in the Sri Lankan public sector health organizations, but had rarely been used since.

Massive customization was required if the system was to be implemented at Dompe Hospital, and they triggered a series of in-depth discussions and negotiations with the vendor that resulted in a revised system: HHIMS V 1.3. The IT budget remained a challenge. The community contributed man-hours to arrange the physical environment so it was ready to implement the technology. This work included a thorough clean-up of the hospital premises and other efforts, such as excavation for the installation of the fiber-optic network cable. The use of the HHIMS has significantly improved the hospital's patient life cycle management process. Patients' details are added to the system when the patients arrive at the hospital for the required treatment. The system generates a unique barcode for the patient that contains the required personal and healthrelated details of the patient and a "Today's Token" is issued using the Electronic Queue Management Centre. The token guides the patient to the relevant service queue and doctor, reducing the chance of incorrect diagnosis and servicedelivery.

Patient's medical history can be accessed by a doctor, the staff at each unit can also retrieve the patient treatment details, all operational reports are now generated by the system. Sensitive patient-health data is stored in encrypted form in the in-house server as a secure location. A three-layered disaster-recovery strategy is in place to minimize data losses that are due to system failures. Moreover, the system has other built-in security features to ensure security of sensitive patient data.

m-Channeling

The m-Channeling system is an automated consultation appointment system that uses the IVR method and allows patients to book appointments using their mobile phones. The service is offered to the public through a hotline. The system, which allows patients the convenience of selecting the required medical services, is designed to be tri-lingual, using Sinhala, Tamil, and English, the main languages used in Sri Lanka, although it currently uses only Sinhala. Upon dialing the hotline, the user will be prompted to select the language (when all three languages are available) and the hospital.

Once the hospital is selected, the system prompts the user to select the required date and OPD session time. The system generates a confirmation SMS with appointment details and send it to the user. At the time of the appointment, the patient presents the confirmation SMS to the reception staff, who then guide the patient to the doctor appointed to m-Channeling patients. Patients collect the prescription drugs from a dedicated drug counter.

Administrative staff update the appointment schedule using a web-based hospital administration portal. The doctor appointed to deliver m-Channeling services receives the appointment details by SMS and email. The administration also has access to incident reports and a visual display of reservations.

People Factors: Supporting the Change

People are at the heart of processes. Employees play a major role in the success of health sector reforms, especially in an e-health context. The engagement of Dompe Hospital's staff commenced at the situation-analysis stage, when the staff at all levels were given a voice in what was going well and what was not.

Lack of appropriate technology skills is a common issue in ICT-enabled improvement initiatives, and such was the case here as well.

The aim was not to have all staff use the system but to increase the staff's overall technology literacy and keep the team's unity intact.

This approach had a positive effect on the overall change-management effort, as it developed and sustained a team spirit among the hospital staff.

Also, patients were trained for the changes and were supported as they believe that the changes were for their own benefit.

A range of activities/programs are in place to sustain and develop the teams spirited culture created during the program's implementation.

Results Achieved

The case illustrates how an ordinary government regional hospital's patient-care process was transformed with the collective efforts of multi-stakeholder power. The reforms have enabled the hospital to increase the quality of patient care, enhance staff satisfaction, gain deep support, and get buy-in from higher authorities and the community. These process reform efforts enabled not only a one-off improvement initiative but a sustained success story that has received national and international attention.

Lessons Learned

A key takeaway is how all of the enabling elements (championship, community, and executive support), lined up, each making its own significant contribution. The absence or misaligned timing of any one of these elements could have caused the effort to stall or fail. The e-champion and his supporters selected and managed the people-centric resources and opportunities in a highly resource-constrained environment while balancing and strengthening the ongoing stakeholder relationships. These efforts served as the foundation for the success and sustainability of this case.

Dompe e Hospital	
General information	• Provision of curative and preventive health care services • 5 wards and 102 beds • Services for more than 520.000 people in the region • Strong community presence in Dompe
Intention	Change the image of a hospital and became an example of patient-centric public health service provisioning in Sri Lanka
Core element	Strategic alignment
Situation faced	• Low reputation of the regional hospital in Sri Lanka • chaotic, mundane, manual processes

	> people-centric effort for service efficiency and effectiveness via staged continuous improvements, collaborative ideation, creative resource utilization, and effective management of its "people" aspects.
Life cycle	process implementation
actions	• The entire patient-care-process was mapped, analyzed, and transformed with IT enabled process improvements • A new patient records management system and a mobile-channeling system was implemented to eliminate long queues and increase the quality of patient care
development model	• Input from the situational analysis, which studied six processes 1. patient registration 2. out-patient management 3. pharmacy and drug management 4. clinic management 5. in-patient management 6. emergency patient management • Changes in physical environment • Patient-Centric ICT-Enabled Processes for Delivery of Medical Services • m-Channeling
Results achieved	• Patient information management and drugs information management, which had been run manually, are now IT-based • Changing negative public opinion to one that is positive has resulted in more people seeking hospital services and consultations. Walk-in OPD patients get service within an average of 40 min, as opposed to ~2 h previously. Patients who use m- Channeling are served in a 15–30 min from arrival to exit • Changing the staff's mindset to being patient-centric and helping them to realize who their real customer is have resulted in doctors' having more time to make better diagnoses through the use of the IT-based health information system and ready assistance from the support staff. • The information gathered through the systems enables the decision-makers to make timelier and more informed decisions.

Lessons learned	how all of the enabling elements (championship, community, and executive support), lined up, each making its own significant contribution

8) Fast Fish Eat Slow Fish: Business Transformation at Autogrill

Introduction

Autogrill Belgium, part of the world's largest provider of catering services to travelers, drifted into a worrisome position in 2006. The company had just gone through a merger, was experiencing financial difficulties, and appeared unable to respond adequately to a changing market context. This case follows Chief Operating Officer (COO) Mario Orinx and Chief Sales and Operations Officer (CSOO) Stan Monheim over a period of 8 years as they led the company through an enterprise-wide business transformation that expanded from Belgium to the Netherlands and France. The story touches upon Autogrill's approach to aligning its staff with the company's vision and strategy and increasing internal communication and cooperation between functions and departments using a business process perspective as part of a holistic approach to business transformation that led to organizational survival.

Situation faced

Autogrill, with corporate headquarters in Milan, Italy, began in 1977 and first entered the Belgian market in 1998. In Belgium's travelers' catering services market, two companies had dominated: AC Restaurants and Hotels and Carestel. In 1998, Autogrill acquired AC Restaurants and Hotels, and eight years later, in 2006, Autogrill took over Carestel too. Things did not go well after the 2006 merger, especially with the former Carestel and AC Restaurants management teams. After following their own strategies for decades, they had a difficult time communicating, let alone collaborating.

Autogrill Belgium's CEO engaged a transformation consultancy organization, which invited Autogrill's management team to a 2-day workshop, held in 2008, on strategy and communication. The workshop made clear that Autogrill was having trouble getting everyone on board in order to work. They agree upon and show their commitment to a vision "to be seen as the market leader". An enterprise-wide transformation program started, aimed at changing Autogrill's way of working, engaging, and making decisions. The

consultants would be there to help along the way. But first, Orinx and Monheim had to ensure that the rest of Autogrill's managers would embrace the new vision so they could execute the vision as a unified team.

Action taken

A holistic approach to business transformation that led to organizational survival in adverse conditions. Its top and middle management discuss the company's vision and make sense of it from their points of view. They cascade the company's vision down through the organization, getting everyone involved in how the Autogrill's future was seen from its management team. The company supports this expectation by providing training and a context in which employees can focus on change.

Internal Customers

In order to improve internal communication and collaboration with colleagues from other departments, the concept of internal customers was introduced such that every manager was an internal supplier of products or services to an internal-customer colleague. A 9-elements framework was provided to facilitate this process. Once the managers had a version of the 9-element framework adapted to their individual situation, they drafted an agreement called 'the 6 points'.

The 9 s and 6 s

The 6-points agreement serves as a personal business plan for every manager and aids them in delivering the service or product to their internal customers as they agreed in their 6-point agreement.

Managing 100 Years of Experience

To help establish best practices and knowledge-sharing, the company introduced a system of micro-communities that focused on fixing these broken business capabilities. Each community consisted of a mix of profiles who worked together to improve a set of business processes.

It was important for Autogrill to have these small success stories at the start to get people accustomed to a new way of working that emphasized process discipline and knowledge-sharing. Annual employee surveys helped to identify effective interventions. The use of employee surveys was not new at Autogrill, but there had never been a standard practice for using the survey results effectively.

The Master Plan

Year after year, the management team agreed on an objective or target state for the next year's transformation, which was then translated into the support initiatives that comprised a maturity growth master plan. The plan included five types of projects that together enabled the organization to mature in a progressive and balanced way over time: vision creation projects, vision focus projects, knowledge management projects, personal contribution projects, and progress management projects. All of the initiatives in the master plan were tracked monthly to ensure follow up, continuity and balance in the transformation approach.

Results achieved

The main outcomes of the business transformation were the establishment of an internal customer orientation, increased decision making speed and the organizational resilience required to thrive under adverse market conditions. Therefore, Orinx and Monheim felt that headquarters could benefit from replicating the approach across the group, which would also solve the communication issue that had emerged from the centralization of certain

functions. Orinx and Monheim were convinced of the value of their transformation approach and decided to convince the Milan headquarters to subscribe to the new way of working. It was the right time to tell the tale of the last 8 years. Several former North West Europe managers who then held positions at headquarters joined in the meeting with the company's top management as a sign of their support for the proposal.

Lessons learned

The Autogrill case study provides a valuable example of and insights into how business transformation can be managed successfully. The story triggers critical thinking about major pitfalls and success factors and how the business process perspective can add value to a holistic approach to business transformation. The most important lesson here is that every aspect of the organization must be incorporated into the transformation approach, so every element of Galbraith's Star Model should be paid attention to: strategy, structure, processes, people and rewards. Three elements and theories of leadership also come to mind as reasons for the transformation approach's having worked: leadership style, culture change and psychological contract theory.

BPM Reference Frameworks

First of all Autogrill had a burning platform, the transformation was led and supported by top management, and they actively involved employees in the transformation. These would be common success factors in any BPM initiative and is generally included in BPM reference frameworks. After the acceptance that the organisation needed to be fixed, Autogrill's leadership has shown true commitment towards the transformation. Employee involvement was included as a central element in the approach from the start. The tools that were used, have been adapted to a language and tone of voice that is recognisable and acceptable for Autogrill employees.

Leadership Style

For the leadership style exerted by Monheim and Orinx, two frameworks can be proposed here: Transformational Leadership and Instrumental Leadership. In essence, Transformational Leadership is a process of building commitment to an organization's vision and objectives and then empowering followers to accomplish those objectives. In contrast, Instrumental Leadership is to incorporate this vision and leadership behaviour into the DNA of an organization and make these things less dependent on particular people and not only clarify the vision but also translate it into a strategy and make sure people can reach that vision and the goals we set for them.

Culture Change

Instead of trying to directly influence people's basic assumptions about internal customer orientation, they installed physical representations of internal customer orientation—like the 6 point agreements— to change people's behaviour and, in the long run, influence basic assumptions.

Psychological Contract Theory

In the pre-transformation phase, employees and supervisors did not seem to have a mutual understanding of the company vision and how it impacted their personal tasks and objectives. In fact, the psychological contract seemed missing or broken. In contrast, the transformation has resulted in clear communication and mutual agreement about expectations, restoring the psychological contract between employees.

Advocating a Business Transformation Approach

The case inspires to consider how transformation leaders can leverage their efforts by positioning their approach as a repeatable process. In the Autogrill case, it comes down to

the regional management readying themselves to convince the corporate headquarters in Milan.

Autogrill	
General information	● Started in 1977 ● catering services to travellers ● 55.000 employess and 900 million costumers ● revenue of 4.3 billion euros in 2015 ● worrisome position (financial difficulties) in 2006 due to a recent merge
Intention	help organizations of all sizes and in all industries overcome the complexities that plague our businesses, our jobs and our lives simplification of processes
Core element	Strategic alignment
Situation faced	● difficulties with communication and collaboration ● The need for a fundamental change was evident after the workshop between the consultants and the management team ● The usual monopoly-like strategy didn't seem effective anymore 1. The need for restaurants near motorways was declining 2. Petrol stations and shops were becoming competitors 3. Customer preferences were changing (interest in particular concepts) 4. lifecycles of catering concepts had decreased significantly 5. Rising prices for raw materials and energy ● The new vision needed embracement and commitment from the rest of the management team
Life cycle	process identification
Actions	1. involvement of lower management echelons in strategic issues 2. Training of manager workforce through coaching sessions 3. Hosting of Informal meetings across the organization's workforce 4. Introduction of the internal customers concept though a 9-elements framework and of the 6 points agreement for each internal customer 5. Application of the 9-elements and 6 -points framework to all employees 6. Introduction of the micro-communities system 7. Agreement on a maturity growth master plan

Master plan	5 types of projects for organization growth in a progressive and balanced way: 1. Vision Creation Projects 2. Vision Focus Projects 3. Knowledge Management Projects 4. Personal Contribution Projects 5. Progress Management Projects
Results achieved	● yearly objectives had been set and consistently met ● Successful merging of Belgium and Netherlands sectors ● transformation of the organization into a stable, change-ready and flexible body that was ready to realize growth, adopt structural changes and withstand external market shocks
Lessons learned	1. valuable insights into how business transformation can be managed in practice 2. critical thinking about major pitfalls and success factors and how a business process perspective can add value in a holistic approach to business transformation 3. every aspect of the organization must be incorporated into the transformation approach 4. raise of questions related to whether the transformation approach is holistic, some aspects of transformation are missing and what the company should have done differently and why

9) The NESTT: Rapid Process Redesign at Queensland University of Technology

Introduction

The higher education sector faces an opportunity-rich digital future. Legislative changes, a globalizing market of learners and educational providers, and the emergence of new technology-based business models (EduTech) are further features of the current situation in this sector. In order to prepare for and to capitalize on this changing environment the Queensland University of Technology (QUT), proactively engaged in this context by establishing the REAL Difference project. It is dedicated to creating both new and unlocking hidden value across the entire university. However, traditional BPM approaches are often time-consuming and not tailored to immediate process transformation, meaning a new, dedicated and agile approach for QUT was needed.

Situation Faced

In the context of the REAL Difference initiative, QUT desired to establish a rapid process redesign capacity and capability. This approach was named the NESTT. The new methodology was aligned with the endorsed design principles of the REAL Difference project such as user-centred design, manage by exception, standardize where possible or simple and sustainable. The availability of unique intellectual property in the area of systemic ideation allowed the accelerated development of the NESTT methodology and ensured availability of qualified facilitators. The ambitious goal was to redesign one decision-intensive process every month.

Action Taken

The acronym NESTT stands for navigate-expand-strengthen-tune/take-off, i.e. the four main stages of its methodology. An integral and defining feature of the NESTT is the way physical space is used as part of the methodology. The NESTT consists essentially of a space with five viewpoints, a methodology and a number of teams, i.e. the innovation team, the panel, the facilitators and the implementation team.

The NESTT Space

It is a unique characteristic of the NESTT that it takes full advantage of the spatial affordances of a dedicated room. The room needs to be able to cater for a group between 8 and 10 people and should allow the use of all four walls and the floor. Each wall and the floor itself depict a different viewpoint on the process leading to a new process design experience.

The Future

It is the most important wall within the NESTT. This wall describes the ambition for the future process and is broken down into the three columns 20 days, 20 months and 2020. Each of these columns is a place to capture related ideas as they emerge during the NESTT. The heading above these three columns is the process vision, that helps to channel the subsequent ideation. It is a motivational, simple statement articulating the ambition and future state of the process.

The Now

It is the wall opposite to The Future. This is essentially the as-is model of today.

The Resources

The third wall captures all the resources involved in the current and in the future process. It graphically displays three vertical sections called systems, people and documents.

The Policies and Procedures

The wall opposite the Resources wall, has the purpose to capture all existing internal and external policies and procedures that guide and often constraint the process.

The Ambition

Finally, the floor is used to articulate the ambidextrous ambition of the NESTT and is differentiated via a line in the middle of the room into problem resolution (the half of the room closest to the Now wall) and opportunity deployment. Working and thinking in the opportunity deployment part of the room is driven by the process vision.

The NESTT Methodology

The NESTT consists of three main stages over a period of 3 months. The first 4 weeks are dedicated to scoping the initiative, defining expectations, constraints and forming the team. The second stage is concentrated on the actual redesign of the process. The final stage then takes the NESTT ideas and implements these where possible within a 20 day timeframe and under the leadership of an implementation champion.

Each of the 4 weeks will be outlined in the following.

Week 1: Navigate

The focus of the first week is on the initial population of all four walls of the NESTT.

Week 2: Expand

The second week is exclusively focused on the 'The Future' wall. The activities in this week are dedicated to rapidly broadening the design space and to derive a comprehensive set of ideas with a focus on the 20 days period.

Week 3: Strengthen

The third week starts with the allocation of idea champions to each of the identified ideas were, each member of the NESTT team will take ownership for one or more ideas.

Week 4: Tune and Take-off

The fourth and final week in the NESTT is all about the 20 days ideas and getting these ready for the 'take-off'. The ideas-on-a-page documents are the key input and complemented with further artefacts needed for their implementation.

Process Selection

In order to select the most relevant business processes for the QUT NESTT three focus groups involving more than 40 senior leaders have been conducted. Each process was discussed in smaller groups and the improvement potential for each process was captured. All processes were then depicted in a two-dimensional framework covering impact of change and likelihood of success. Processes rated as high in both dimensions were shortlisted and the first three were selected, i.e. corporate card, web page approval and travel management.

The NESTT Teams

The NESTT consists of four teams, the innovation team, the facilitators, the panel and the implementation team.

The Innovation Team

The innovation team is made up of approx. 8 stakeholders from across the organisation and consists of the following roles.

1. The innovation champion is the leader and external interface of the team.

2. Two intensive users ensure the ongoing inclusion of customer viewpoints.

3. The service/process owner will have a vested interest in improving this process.

4. Two service providers ensure that access to substantial end-to-end process experience is available.

5. The process expert is the team member closest to the process, needed to discuss every single step.

The Panel

The panel ultimately judges, and in this capacity endorses, the ideas proposed by the innovation team. As such, the panel needs to have the authority and the competence to assess the proposed process changes.

The Facilitators

A number of facilitating roles are needed to ensure the success of each NESTT initiative. The senior facilitator, moderators of sessions, analysts, ideators and a drama facilitator.

The Implementation Team

Once the ideas have been presented and endorsed, an implementation team takes over.

The Processes in the NESTT

QUT had engaged in four NESTT initiatives covering the following processes: corporate card, web page approval, travel management and research grants.

As an example, for the corporate card it became clear that the act of issuing a card was approval intensive (up to seven signatures), paper-intensive (up to ten documents) and as a consequence time consuming and costly to facilitate. Furthermore, the reconcilation was constrained by system limitations leading to time-consuming coding and approval processes. It became obvious that this process had significant potential for improvement.

Results Achieved

The NESTT led to three tangible outcomes for QUT. First, the performance of the processes has been significantly improved. Second, the NESTT has provided the organisation with a much valued redesign capability and capacity. Third, participation in the NESTT has been an important up-skilling for the QUT staff involved and has had a positive impact on the organisational culture and attitude towards change.

Lessons learned

The experiences with the NESTT have demonstrated that rigorous process change can be done quickly and that conducting such change can be a highly enjoyable experience for everyone involved.

Decisive Governance

It is essential to embed the rapid NESTT approach into an equally rapid governance structure.

Intellectually Agile Participants

The NESTT relies heavily on the creativity, energy, mindset, competence and attitude of the participants. It is crucial to channel conversations into the right sessions.

Comprehensive Facilitators

NESTT facilitators are probably the most critical success factor. They are expected to have strong design capabilities and an ability to develop shared stories of compelling future process scenarios, also to have strong conceptualization and system thinking skills, and the ability to work with diverse stakeholders and guide conversations constrained in a limited NESTT timeframe.

NESTT (Queensland Uni of Technology)	
General information	• engagement in establishment of the REAL difference project • focus on research for present and future real-world requirements
Intention	Establish a rapid process, since traditional BPM approaches are often time-consuming, exclusively focused on pain points and not tailored to immediate process transformation, meaning a new, dedicated and agile approach for QUT was needed
Core element	Methods
Situation faced	Establishment of a rapid process redesign capacity and capability for the following reasons: • Identify and benefit from quick wins for operational gains within selected, high-volume decision-making processes • Contribute to a culture of positivity with regards to the changes required • Create a capacity that accelerates design activities in other, significant REAL Difference projects such as travel management and • Upskill QUT staff in the areas of process analysis and design.
Life cycle	process redesign
actions	The NESTT Space 1. The Future 2. The Now 3. The Resources 4. The Policies and Procedures 5. The Ambition
NESTT model	1. Week 1: Navigate 2. Week 2: Expand 3. Week 3: Strengthen 4. Week 4: Tune and Take-off 5. Process Selection With the following team groups: • The Innovation Team

	• The Panel • The Facilitators • The Implementation Team • The Processes in the NESTT
Results achieved	Ten significant ideas were developed ranging from streamlined, self training and single approval arrangements as part of the issuing of the card over to an increased use of credit cards replacing purchase orders and reimbursements to digital receipts and declarations (instead of time-consuming state declarations).
Lessons learned	• Decisive Governance • Intellectually Agile Participants • Comprehensive Facilitators

10) Kiss the Documents! How the City of Ghent Digitizes Its Service Processes

Introduction

The case focuses on the digitization of service processes in the City of Ghent. Front-office e-services are integrated into the corporate website and into the back office thanks to digitization of the internal way of working in value chains. The case fits within a master plan called “LEO” to make all services delivered by the City more customer-oriented and driven by the demands of local citizens, organizations, and associations. The master plan seeks to optimize the City’s physical and digital services.

Situation Faced

The departments in the City are accustomed to working in silos. Some services worked with loose e-forms developed in various technologies, and numerous forms could be downloaded that customers had to fill out, print, and post or deliver physically. In 2014, the corporate website was renewed to feature a more intuitive structure and advanced search functionalities, based on Search Engine Optimization (SEO),so customers could easily find the information they were looking for. In addition, an increasing number of unique visitors use the corporate website, providing evidence for the value of more investment in e-services. Inspired by the digital evolution in society, the City wants to take another leap into digitization.

Needs

A more customer-oriented and a more uniform way of working, higher return on investment from IT projects and increased reuse of digital investments.

Constraints

As a public organization, the City faces some specific constraints: High privacy concerns, limited budget, limited degree of freedom for the services, large set of heterogeneous customers, any need for outsourcing should always be launched publicly and historical evolution of working in silos, resulting in a large number of applications.

Incidents

Three departments offered digital services for taxes, for mobility and parking affairs, and for citizens' affairs before 2014. The various web forms were often complex, and the use of some were limited to specific browsers. Therefore, only a few customers used the digital services, and customer complaints were rising. These incidents also illustrate a silo mentality, which was the main reason that the early digital investments did not pay off.

Objectives

The City's goal was to digitize more and to digitize better. The City's digitization effort not only targets its direct contact with customers on the corporate website (front office) but also its internal way of working (back office). Business processes would be translated into digital chains to facilitate reuse for both the front office and the back office. Possible examples of reuse across value chains include a standardized way to authenticate users, to sign a document electronically, and to pay for an online service. Information and forms regarding e-services should be available on any browser and on any device.

Action Taken

The core business processes were modeled using the standard BPMN process language for process identification, discovery, and analysis. The process-redesign phase was driven primarily by the optimization approach of Lean Thinking, which seeks to minimize waste and to maximize customer value.

Next, for process deployment and implementation, a service-oriented architecture (SOA) was chosen to reuse service components and to create a common architecture. For each digitization project, the process lifecycle phases are managed by a business and an IT project manager, who collaborate closely. After a project is deployed and implemented, process ownership remains on the business side, and the IT project manager focuses on another process.

The six core elements of BPM: methods, information technology, strategic alignment, governance, people, and culture, are all covered by the City. The City conducted a BPM maturity assessment based on similar elements almost eight years ago, but its use was discontinued later. With the current digitization vision, the City intends to relaunch the idea of a process-oriented way of working built on fifteen principles called “building blocks”.

The two general principles are the fundamentals from which to start: corporate identity and “KISS the documents.” All e-services should comply with the corporate identity of the City (e.g., using the same colors, fonts, logos). The acronym in “KISS the documents” stands for “King” (the customer), “Individualized”/“Immediate” (service) and “Simple”/“Stupid”.

The other digitization principles are more technology-oriented. As a third principle, the City should have an authentication platform that is based on the type of authentication (either strong authentication with the eID platform or a weaker authentication with the MyGhent platform the fourth principle). As for the fifth building block, the City intends to use a single form generator to create any form in a uniform way.

As for the sixth and seventh principles, both customers and employees should be able to sign documents electronically. The system also supports an eighth principle, electronic payment for services. The ninth principle refers to a digital safe to store documents and share them both internally and externally. Reuse by external parties can be realized by means of the tenth and eleventh principles, open services and master data. Reuse is also enabled by means of the twelfth principle, an Enterprise Service Bus .

The City's product catalog is currently designed as linked open data and is aligned with the catalog of the Flemish government as a semantic web. Finally, the fourteenth building block of case management, which ensures that requests will be followed up of a customized digital back office. The City intends to replace the customized back office applications with a generic case-management system to the degree possible. Using these fifteen principles, the City identified generic components shared across business processes in order to encourage reuse.

Next, the generic service components were translated to the digitization of three pilot chains before generalizing the approach to all services. The "taxes", the "environment" and "citizens' affairs" chain were chosen.

Results Achieved

Although the pilot for citizens' affairs is still running, the results of the pilots for digital tax submissions (the number increased) and environment-related subsidies (requests are now digitally processed) are already positively perceived. Besides being generalized to apply to all services, the digitization approach will also be applied in other business processes. The main idea is to develop once and then to reuse it maximally. An additional advantage of working with the tool is access to figures for management reporting.

Lessons Learned

Other organizations may benefit from the lessons learned in this case. The most important lesson from this case is that departments that are accustomed to working in silos can be convinced to work from an organization-wide vision instead as long they understand "why" and the potential benefits. Firms should also work toward their final objective with small steps at a time.

Align with External Partners Semantically

The product catalog is aligned semantically with an external business partner in the chain, the Flemish government. This strategic choice created the availability of open data and will eventually lead to a shared catalog for public services.

Be Pragmatic Instead of Dogmatic

The City decided to define different types of documents (e.g., registration forms, evaluation forms, and administration forms), each with a specific procedure. As such, a uniform procedure was established, albeit per document type.

Assist Departments

One way to overcome resistance is by giving centralized assistance to the departments in order to undertake the endeavor together. Since change management is key for any innovation project, this lessons is not limited to the context of a city council.

Be Open to Temporary Workarounds to Achieve Quick Wins

Since the digitization vision in the City requires generic components, the implementation was more complex than merely providing the functionality required for a single chain. Although reuse is beneficial in the long run, quick wins can be achieved by means of a pragmatic approach with temporary workarounds. Workarounds are common practice in many IT projects and are not limited to e-government projects, so they may support change management since early success stories are critical to convincing employees to undertake a new way of thinking.

Switch from Silos to a Single Profile per Customer

This is the idea of a (social) Customer Relationship Management (CRM) system, which is frequently present in private organizations.

Ghent	
General information	● Belgian public-sector organization ● 250,000 citizens, 3000 employers and 5000 civil servants ● close collaboration with the Public Welfare Center of Ghent and with Digipolis ● less competitive and more certain environment than the average organization
Intention	optimize the City's physical and digital services, with digital service delivery taking the lead in the long term
Core element	Methods
Situation faced	● Low usage of the web forms for taxes, mobility and parking affairs due with some web-forms being browser-dependent and the processing being partially digital which led to customer complaints ● The renewal of the corporate website which is based on Search engine optimization further pushed the goal into digitalization 1. Needs (more customer-oriented and uniform working way, lower costs for IT projects, increased reuse of digital investments) 2. Constraints (high privacy concerns, limited budget, monopoly and specific legislation on services, large set of heterogeneous services and customers, possible public outsourcing, large number of applicants) 3. incidents (300 services provided that need considerable manual intervention) 4. Objectives (digitalize more and better)
Life cycle	process redesign
actions	1. formulation a digitization vision based on fifteen reusable building blocks, including that facilitate the use of an authentication platform, a single customer profile, a digital signature platform, and a service-oriented architecture. 2. the building blocks were built as generic components or process activities that e-services typically contain. The generic components were first translated to

	the digitization of three pilot chains regarding taxes, environment-related subsidies, and citizens' affairs. The pilots were chosen based on their having volunteered to participate and their opportunities to take advantage of digitization. 3. Guidance of projects that digitize the total value chains or business processes.
Build blocks model	1. KISS the documents 2. Corporate identity 3. Authentication platform 4. MyGhent 5. Form generator 6. Digital signature 7. Validity of e-signed documents 8. E-Payment 9. Digital safe 10. Open services 11. Master data 12. ESB 13. Product catalog 14. Case management 15. Digital back office
Results achieved	● All environment-related subsidy requests are now digitally processed in the back office, with a digital alternative in place for the process steps of receiving and responding to the subsidy requests in the front office since 2015. ● The number of digital tax submissions increased to a third of all submissions in 2016, compared to only five percentage in 2014 ● the number of input forms was cut in half in favor of prefilled tax proposals.
Lessons learned	• Align with External Partners Semantically • Be Pragmatic Instead of Dogmatic • Assist Departments • Be Open to Temporary Workarounds to Achieve Quick Wins • Switch from Silos to a Single Profile per Customer

11) Application of the Design Thinking Approach to Process Redesign at an Insurance Company in Brazil

Introduction

The health insurance market in Brazil has seen significant changes recently, especially in the process of purchasing raw materials for medical treatments. In responding to these changes, the largest independent insurance company in Brazil (the Insurer) reviewed its health insurance information system to determine whether it could support great demand from hospitals quickly and adequately, and could help to control the entire purchasing process, from purchase authorization, to acquisition, delivery, and payment to suppliers.

When the Insurer reviewed the features of its health insurance information system, it was clear that part of the material- purchasing process was done informally instead of being implemented through the system. Moreover, there was no consensus among the stakeholders about some of the process's fundamental concepts and procedures that the system must support. These challenges occurred partially because of the absence of a common understanding of which materials did not require authorization—the "Authorization Not Required" (ANR) materials—and the process for purchasing such materials.

Situation Faced

Doctors and hospitals often received commissions from producers of medical equipment and pharmaceutical companies for giving preference to their products, which resulted in more expensive and suboptimal treatment. Insurance companies' decided to take control of this procurement process, therefore hospitals are now obligated to send the material requests directly to insurance companies resulting in significantly reducing costs.

Because the Insurer had to restructure its purchasing process, it acquired a new information system for research, quoting, and selection of the most appropriate material. However, the existing internal purchasing process came into conflict with the new system. There were two

information systems in operation, automating two different parts of the same process. Therefore, the Insurer assigned to its information technology (IT) team the task of collecting the requirements necessary for the development of an updated, improved, unified information system that could fulfill two primary objectives:

• Make the material purchase process efficient and consistent.

• Include management of ANR materials in the information system in order to eliminate manual and uncontrolled actions.

The IT team first used traditional procedures, such as meetings and interviews. More than 100 meetings were held over nine months but failed to result in a satisfactory outcome, because people could not communicate their problems and needs in a clear and effective way. Therefore, the Insurer decided to hire the ADDTECH consultancy to help in gathering requirements for the development of information system functionality, encompassing the needs of all departments involved in the purchasing process.

Action Taken

ADDTECH proposed applying the Design Thinking approach where collaboration is essential and members of a multidisciplinary team are stimulated to open their minds to insights and to provide input about their perceptions of the problem and possible solutions. The Design Thinking approach can comprise five iterative stages: empathize, define, ideate, prototype, and test. The empathize stage seeks understanding about the target audience (end users, customers, or clients) for the action. The define stage focuses on identification of root causes of a problem to be addressed. Solutions to the problem are developed in the ideate stage. The selected solution is then implemented in the prototype stage and, finally, assessed in the test stage. However, the Design Thinking stages are not linear, but iterative and dynamic, which supports creativity and innovation.

The Design Thinking stages can be mapped onto the five phases of the BPM lifecycle: The empathize stage is related to process discovery, the define stage to process analysis, the ideate stage to process redesign, the prototype stage to process implementation, and the test stage to process monitoring and controlling.

The project involved four working groups (WGs), each group participated in a series of Design Thinking workshops (the Sessions) in September 2015. The tools applied at each workshop, among other tools, the Business Model Canvas, a visual chart that were used to extract and organize the participants' thoughts, leading to the solution development.

Nine collaborative Sessions took place. A Session facilitator (an ADDTECH representative), created empathy among the participants by clarifying what results the Session was intended to achieved and using what tools. The main idea and goal of each canvas was explained and the tasks to be performed were clarified. For each task, a strictly defined period of time was set and controlled by the facilitator, an approach called timeboxing.

Then the facilitator described the brain swarming technique, which elicits ideas about ways to achieve a goal or address a problem, taking into consideration the available company resources. Members freely expressed their thoughts by writing them on sticky notes, which were then placed on part of a canvas. Next, the facilitator guided the participants in selecting, organizing, and synthesizing the ideas placed on the canvas. The solution that came up was adjusted until a consensus among all Session participants was achieved.

Action Taken During the Empathize Stage

It is necessary first to understand how a business process operates in order to represent it in a model properly. Therefore, multiple stakeholders with differing but complementary skills might collaborate on this task, which typically involves communication and information-gathering. In order to clarify the problem, the immersion workshop was conducted after the kick-off workshop.

Action Taken During the Ideate Stage

Process redesign is not always conducted in a systematic way but is instead a creative activity. After the collection, organization, analysis, and synthesis of all relevant information, as well as the immersion into the context and root causes of existing issues, creative solutions that address the clients' needs and desires emerge. The Stories and Requirements workshop and the Prioritization workshop were conducted during this stage.

Action Taken During the Prototype Stage

During the prototype stage, WG representatives validated and brought into force the outcomes of the previous Sessions. During the Functionality Refinement workshop and the Development Planning workshop they discussed the final list of the features to be implemented by the information system.

Action Taken During the Test Stage

Once the implementation is completed, continuous monitoring and controlling of the process execution is required in order to determine whether any adjustments are needed.

In the Insurer's case, the test stage is still underway. Many of the main features have been implemented and validated, but comprehensive results of implementing and monitoring the redesigned purchasing process are yet to be reported.

Results Achieved

This section summarizes the outcomes of the workshops that were related to each Design Thinking stage (empathize, define, ideate, and prototype), as well as those of the overall case.

Outcomes of Applying the Design Thinking Approach

In the empathize stage, applying the Process Design Canvas, resulted in the as-is process model of the existing purchasing process. During the define stage, the Definition Canvas and the Process Design Canvas were used, modeling a more optimized, qualified and secured to-be purchasing process and the sub-process for procurement of ANR materials. During the ideate stage, the requirements and associated features to be implemented in the information system were further structured and prioritized. In the prototype stage, all participants had a shared understanding of the system's desired functionality. The IT department then used the Project Model Canvas to visualize the elements required to manage the software implementation project. Finally, the prototypes of the new features that corresponded to the to-be process were developed.

Contributions of Applying the Design Thinking Approach

The results achieved during the Sessions addressed the gaps between existing and desired features of the information system. The two major outcomes were formalizing the clients' perceptions regarding the existing purchasing process and the designed to-be process, which was simpler and more objective than the as-is process and included significantly fewer steps to be performed. The redesigned purchasing process is still being implemented.

Lessons Learned

The case demonstrated the value of applying the Design Thinking approach to process redesign and improvement, adding useful instruments for BPM analysis. The BPM lifecycle phases correspond well with the Design Thinking stages, and Design Thinking techniques match BPM's social-construction viewpoint well.

Design Thinking added useful instruments to BPM analysts' tool set. The BPM lifecycle phases correspond well with the stages of Design Thinking. Moreover, contrary to the common procedure, a "pre-immersion" stage at the project outset, was created with the

intention to extract the domain knowledge that was required to validate the requirements regarding the project's scope and process up front. Finally, it should be noted the flexibility of Design Thinking techniques in making adjustments to their procedure.

The insurer	
General information	• Largest independent insurance company in Brazil. • Employs more than 5000 people. • The company generated around US$4.2 billion. • The company generated profit of US$138 million. • Serving about seven million customers.
Intention	• Make the material purchase process efficient and consistent, excluding the intermediate information system. • Include management of ANR materials in the information system in order to eliminate manual and uncontrolled actions.
Core element	Methods
Situation faced	• ANR materials did not have a standard definition, so deciding a material was an ANR material was subject to the individual interpretation of the professional in charge. • The share of ANR items increased to 40% of all ordered materials, but because they were not considered relevant to be registered, they were ignored during the development of the "supra-system." • ANR materials were purchased outside the information system using a manual process and using phone and email for communication and decision-making. • The number of frauds involving ANR materials increased.
Life cycle	process discovery
Actions	Application for the Design Thinking approach 1. Empathize (discovery of contextual elements that might clarify a process) Workshops: Kick off, Immersion 2. Define (problem analysis that supports the design of an as-is process model) Workshops: Material Definition, Process Design, Business Model 3. Ideate (finding creative and implementable solutions to be reflected in the to-be process) Workshops: Stories and requirements, Prioritization 4. Prototype (execution of the to-be process) Workshops: Functionality Refinement, Development Planning

	5. Test (acquiring insights into how the running solution could be improved)
Results achieved	1. formalization of the employees' perceptions regarding the existing purchasing process 2. design of a to-be process for material purchasing, which was approved by all stakeholders 3. formalization of requirements for the new information system for managing the material purchasing process.
Lessons learned	1. Design Thinking added useful instruments to BPM analysts' tool set 2. This case is likely to render a methodological contribution to the Design Thinking approach 3. Flexibility of Design Thinking techniques in making adjustments to their procedure

12) Collaborative BPM for Business Transformations in Telecommunications: The Case of "3"

Introduction

Many business changes in the telecommunications sector are initiated by mergers and acquisitions, and the fast pace of this sector requires that businesses adjust or extend business processes in a minimum of time. "3'' the mobile communication brand of CK Hutchison Holdings, is a leading global mobile telecommunications, data services operator, and pioneer of mobile broad-band technology. Therefore, "3" constantly faces the challenges associated with take-overs and mergers.

Situation Faced

Problem

"3" conducts acquisitions and mergers in Europe, requiring numerous adjustments in processes across organizations. These adjustments lead to many business transformations that must be managed. When businesses are merged, the challenges can include consolidating divergent business processes and joining implementations that often have different system components. The "3" Group Europe pursues the global single instance (GSI) concept, which requires a centralized ERP system with consolidated business processes for every associated operating company. This centralized ERP instance provides common and country-specific ERP processes and functions. The GSI consists of the standard ERP system Oracle E-Business Suite and the so-called Belt Systems. Modules for nine areas are used within the scope of the standard ERP system:

• Order management

• Inventory management

• Manufacturing

• Purchasing

• Receivables

• Payables

• Assets

• Cash management

• General ledger

The Belt Systems, custom-developed systems that are integrated into the ERP standard software, are connected via standard interfaces and are also an element of the GSI. The current solution, has reached such a high level of complexity that it is barely manageable.

Needs

A BPM solution had to be implemented for the GSI that met nine requirements:

• Support the implementation of new or adapted processes and functions of the global ERP instance.

• Provide an extensive documentation of processes, functions, and the corresponding IT implementation.

• Ensure efficient management of mergers and acquisitions.

• Establish an environment for and an approach to a global requirements management system.

• Support execution of rollouts of the centrally administered ERP system.

• Harmonize global business processes and local particularities.

• Provide an integrated test management system.

• Establish knowledge management for all parties involved.

• Ensure that the approach and environment can manage the complexity of the global ERP instance.

After building an adequate BPM environment, the ERP solution of the GSI must be documented with models for the business processes, business objects, and the corresponding GSI solution functions and components. These models should be used for changing and merging businesses.

Objectives

3 Group Europe wanted to build such an environment for the implementation and extension of business processes across organizations within the frame of differently sized ERP projects. During this BPM case, the business processes that had already been implemented in the GSI were initially provided as models in a centralized repository and were subsequently extended and adapted collaboratively by all parties involved.

Action Taken

In a first step, a BPM repository for the GSI processes was created, the BPM environment was extended by means of collaborative functions, and a corresponding approach was

established at the company. Based on this approach, the divergent business processes of different business entities were coordinated and the technical integration between relevant system components was aligned. Finally, the BPM environment was integrated with the test management system to provide a generation of test cases based on the business process models.

Creation of a Business Process Repository for the GSI

"3" conducts projects for the realization of business processes across organizations on the basis of predefined reference processes that depict the current state of the global solution. The purpose of these reference process models is to describe business processes, business objects, functions, and their relationship to each other in order to depict and communicate the possibilities for realizing business processes using already existing GSI system components.

The BPM repository for the GSI consists of three main components:

• Horus Business Modeler: Hierarchical business process and business transaction descriptions.

• Oracle User Productivity Kit: Additional self-service training components on the functional level of the business process hierarchy.

• HP Quality Center: Test cases that are linked to the particular business transactions (BUCs).

Implementation of a Collaborative BPM Approach

In order to use the knowledge of all parties involved in the projects effectively, the design and the implementation of business processes is supported by an extension of the BPM environment for social media to provide a collaborative environment. All three views of a business process (business, process, and IT) can be created.

Coordination of Business Processes Based on Environment and Approach

The alignment of the future business processes of merged businesses or other business transformations usually starts with mapping the business transactions in the form of BUCs. Then the essential process level must be discussed and adapted to the appropriate level.

Alignment of the Technical Integration

Communication among all included parties' IT experts on a technical level is needed to align the technical integration, so technical detailed procedures and data structures from the previously covered process level must be clarified for every step.

Integration of BPM and Test Management

The test management system was integrated into the BPM repository to realize adapted business processes and their IT-technical implementation. Each physical test case is summarized into a container, where one logical container exactly corresponds to one BUC and holds all physical test cases that are necessary for the functional test of the BUC.

Results Achieved

Based on the realized BPM environment and the developed approach, many positive effects resulted from the actions taken.

Deliverables

Collaborative Global BPM Environment

The main result is documentation of the entire global business process for the corporation on three levels: business services, rough business processes, and detailed business processes

with assigned roles and system components. The corresponding technical processes are also documented.

A collaborative environment supporting communication and cooperative work on business processes was also established. The new possibilities of collaboration based on social media were used. Social BPM was realized by combining the procedures and technologies of social media with BPM methods.

Establishment of a Social BPM Approach for Projects

In the social network, the requirements of the involved parties can be exchanged and BUCs, process models, and other artifacts can be defined for a common solution. The implemented environment supports this collaborative design by connecting the experts from different organizations and domains.

Active Knowledge Management

Another important result was creation of a knowledge net that provides information about the dependencies of business processes and their technical realization. The net helps to identify efforts and license costs for changes or rollouts to the corporation's other operating companies and all involved parties can use it. In combination with the collaboration functions, the knowledge net supports active knowledge management.

Support of Process-Based Testing

Test cases for new business processes can be created semi-automatically out of the process models based on the process descriptions on the detailed levels. A business analyst defines possible testing paths and outputs with the testing team, tags these paths in the process models, and transfers them to the test management system as physical test cases. An interface between the BPM system and the test management system generates the individual steps of the test.

Management of Increased Complexity

The predefined processes, functions, business objects, and system components define a basis on which the communication regarding cross-company processes between parties involved can be coordinated. When a merger or an acquisition of companies occurs in this sector, using the described approach to identify and consolidate differences and similarities provides a substantial advantage.

Business Outcomes

The collaborative BPM environment and the established approach provide fast implementations of ERP projects.

Lessons Learned

Four lessons learned were identified:

BPM Must Be Combined with Other Fields Successful

If the process models are connected with related areas like test management or training, they become “living” process models.

Complexity Management Requires Linking Artifacts

Interconnecting a variety of model types helps to manage the increasing demands regarding speed of change and complexity in global environments of both business and IT.

Social BPM Increases the Effectiveness of International Work

Social BPM helps to connect people in an international environment to enable effective collaborative work. The combined use of a BPM environment and social media provides a framework for working together efficiently in a global context.

Business Transformations Require the Involvement of Management

Business transformations are strategic projects, and they need the awareness and support of top management.

The case of "3"	
General information	• Mergers and acquisitions lead to many business changes in the telecommunications sector • The fast pace of this sector requires that businesses adjust or extent business processes in a minimum if time • "3" which is a leading global mobile telecommunications, data services operator and pioneer of mobile broad-band technology
Intention	build an extended social BPM environment for the Global Single Instance (GSI)
Core element	Methods
Situation faced	• "3" constantly faces the challenges associated with take-overs and mergers o numerous adjustments in processes across organizations which lead to many business transformations that must be managed o For business merging: consolidating divergent business processes and joining implementations that often have different system components o For change of processes across organizations: careful management is required for various procedures The current solution, based on configurable business software was highly complex and barely manageable.
Life cycle	process redesign
Actions	• Development of a comprehensive social BPM environment with predefined process structures to master the challenges faced, within given time restrictions • Implementation of support for collaborative work on all project phases

Results achieved	• F&R could perform reliable estimates of progress on tasks and expected cost to completion (analyzing the up-to-date data on the progress of the work and consulting with the workers on the construction site) • increase in productivity that was estimated to have saved 400 man hours.
Lessons learned	• Importance of collaborative nature. • Importance of flexible project management. • Significance of existing a reliable measurement of the progress. • Importance of worker's empowerment. • Importance of good systems in project management.

13) Process Management in Construction: Expansion of the Bolzano Hospital

Introduction

Frener and Reifer (F&R) is a leader in engineering, fabricating, and installing facades with non-standard designs. The company was looking for comprehensive, domain-specific approaches to improve the company's control over facade processes, from design to execution and monitoring. It is important for the company to make an accurate budget estimate and to respect it while executing the process. While the budget should be sufficient to carry out the project, has to make appealing offers that beat its competitors.

Situation Faced

In 1998, the province of Bolzano issued a call for refurbishing and then expanding its hospital by building a new clinic composed of three wings and a new entrance area. F&R was responsible for the design, engineering, fabrication and installation of the facades of the three wings of the new clinic, which were planned for completion by the end of 2016. F&R proposed a solution that was tailored to the project. A number of issues made the management of this project challenging for F&R.

The process is non-repetitive and requires a high level of creativity, as the components for each part of the facade differ. The company had to ensure that the components were available when needed and that they were unloaded at the right place on site. In addition, to avoid delays, F&R had to synchronize its activities with those of the other companies that were working on site. Overall, F&R wanted to improve different aspects of the process management, to improve its control over the execution process. The company wanted to improve the process design, implementation, and monitoring phases of their process management lifecycle.

Process Design: Lack of a Detailed Process Model

The aims of a process model are to communicate with the customer and to synchronize at a high level the work of multiple companies. Traditional process models provide only an abstract idea of the process execution and are rarely used as guides in the process execution. A more detailed process model could support the early discovery of potential problems or inconsistencies in the process.

Process Design: Difficult Synchronization Among the Company's Departments

F&R not only installs facades but also engineers and fabricates the facade components. However, the company's departments work with tasks at differing levels of granularity that complicates the internal synchronization and the alignment with the construction site.

Process Implementation: Lack of Support for Detailed Scheduling

In most cases, scheduling of the activities to be performed is left to the foreperson, who has inadequate IT support so must rely on oral communication with the workers and on pen and paper to define a daily schedule. This approach introduces risks because it is prone to error and binds the success of the project closely to the abilities of one person.

Process Monitoring: Unreliable Measuring of the Project's Progress

The progress of the work on site is measured in terms of expenses incurred rather than in terms of the work performed.

Action Taken

In the context of the project build4future, the research partners and 12 small and medium-sized enterprises (SMEs) from the Bolzano province, developed a methodology called PRECISE, the purpose of which was to support and improve the phases of the construction

process-management lifecycle. The PRECISE methodology supports primarily three interconnected project phases: (1) process design, by supporting collaborative process modelling; (2) process implementation, by supporting detailed short-term scheduling of the activities; and (3) process monitoring, by supporting short-term monitoring and measurement of the construction progress.

Development of the PRECISE Methodology

Process Design

To achieve a reliable process model, the methodology suggests the involvement of experts from the various companies involved. They define the model in a collaborative way. Workshops are orchestrated by a neutral moderator who has no economic interest in the project.

Starting from the approval and the shop floor drawings, the companies define an abstract representation of the building by identifying precisely the locations in which the tasks are performed, the main tasks to be performed and the definition of the temporal dependencies among the tasks.

Process Implementation

It details the process model with additional information resulting in a short-term schedule. In addition, decisions are made concerning when to make resources like cranes and materials available. To specify a schedule, the foreperson defines the period of time, which activities to perform in that period, by whom they should be performed, and where to perform them. The foreperson also considers the temporal dependencies from the process model.

The PRECISE methodology defines certain criteria to support the schedules' reliability.

In order for a schedule to be reliable, it must cover only a short period of time and be based on actual data. Long-term schedules rely heavily on forecasts of the progress of the work.

Monitoring the Construction Process

The aim of monitoring is to collect data on the progress of the work on site. The methodology suggests using this data as a starting point for scheduling so the scheduler has updated information on the tasks that are not yet completed. The data is also used to update the expected productivity for the tasks in the process model. The companies can take advantage of the monitoring data by performing various kinds of analysis to evaluate the project's overall progress and they can forecast the amount of work yet to completed in a detailed and reliable way.

Application of the Methodology

Bolzano Hospital Process Design

As one of the participating companies, F&R decided to apply the PRECISE methodology to its Bolzano hospital project. However, since none of the other companies that were working on the hospital project was also taking part in build4future, they did not participate in the collaborative process modelling phase.

Before F&R executed the process on site, the Free University of Bozen-Bolzano and the Fraunhofer Italia Research Center, as scientific partners of the project, organized a collaborative workshop involving the project manager and the foreperson. The workshop participants first agreed on how to represent the locations, and after, the main tasks were identified. Consequently, workflow, information flow and material flow dependencies among the tasks were defined. At the end of the workshop, the process model was copied and transformed into a digital document.

Scheduling of the Tasks

Once the process model was defined, it provided a significant amount of detailed information on the tasks. The next step was to plan the tasks' execution based on the process model and the dependencies among the tasks. When the process model defined no strict temporal constraints on a task, the company could decide when to schedule the task according to internal priorities and preferences.

When the methodology was applied, the tables to support scheduling were generated ad hoc. In particular, a table obtains from the process model the list of tasks. Then, the foreperson forms the crews by assigning workers to the scheduled tasks. The foreperson usually defined the schedules on Friday afternoon for the upcoming week using Microsoft Excel, filling in the tables that were prepared by a researcher from the scientific partners. Excel allowed the foreperson to visualize the saturation of the workers. On Monday morning, the foreperson hung the scheduling tables at the construction site, where workers could see to which tasks they were assigned.

Monitoring of the Work on Site

The progress of the work was monitored daily. When the productivity for a task was lower than that which had been estimated, the reason was noted. Every Friday afternoon a researcher from the scientific partners collected the data and copied it into Excel spreadsheets. These spreadsheets allowed the monitoring data to be elaborated in order to support analysis of the project's overall progress. All of these charts were hung at the construction site so every worker had an overview of the project's progress.

Continuous Improvement Workshop on Site

Four "continuous improvement workshops" were held to analyze the data collected from the construction site and the charts produced from it. During these meetings, the project director, the project manager, the construction foreperson, and the vice-foreperson

discussed the general overview of the construction performance, focusing on the most recent 4 weeks.

Results Achieved

F&R's employees were initially skeptical about using the new methodology, but after the initial phase they saw that it did not require significant time nor was it used to control them. On the contrary, it was used so the workers could have more control over the process management. F&R was satisfied with the results it obtained and has already applied it to other projects. By applying the methodology, F&R could perform reliable estimates of progress on tasks and expected cost to completion and recorded an increase in productivity.

Lessons Learned

One of the main characteristics of the methodology is its collaborative nature. Application of the methodology singled out some aspects of the process that should be addressed to improve process management. Flexibility, is achieved by defining a process model and a short-term schedule, while the availability of reliable and up-to-date data on the progress of the work is obtained by applying continuous, detailed process monitoring. Engagement of the workers in the process management allows the project to benefit from their expertise, which is the basis of the collaborative approach. However, better IT support for the methodology is needed.

Expansion of the Bolzano Hospital (F&R)	
General information	• Freiner and Reifer is a medium-sized enterprise which is the leader in engineering, fabricating, and installing facades with non-standard designs • Processes of F&R have a high level of originality so the management relies only partially on previous experience from other projects
Intention	Improvement of the process design, implementation and monitoring phases of the process management lifecycle
Core element	Methods
Situation faced	• Process Design: Lack of a Detailed Process Model and difficult

	Synchronization Among the Company's Departments. • Process Implementation: Lack of Support for Detailed Scheduling. • Process Monitoring: Unreliable Measuring of the Project's Progress.
Life cycle	process redesign
actions	Development of PRECISE (domain-specific methodology) and its application by F&R for the construction of the hospital in Bolzano based on the following steps 1. collaborative process design, with the main figures taking part in the construction project 2. process implementation, which involves defining short-term schedules for tasks based on actual data on the progress of the work 3. continuous monitoring and measurement of the progress of the work on site.
Results achieved	• reliable estimates of progress can be performed on tasks and expected cost to completion • Iincrease in productivity that was estimated to have saved 400 man hours.
Lessons learned	• Importance of collaborative nature. • Importance of flexible project management. • Significance of existing a reliable measurement of the progress. • Importance of worker's empowerment. • Importance of good systems in project management.

14) Exposing Impediments to Insurance Claims Processing

Introduction

Processing injury-compensation claims, such as compulsory third party (CTP) claims, is complex, as it involves negotiations among multiple parties (e.g., claimants, insurers, law firms, health providers). Queensland's CTP program is regulated by the Motor Accident Insurance Commission (MAIC). The Nominal Defendant (ND), an arm of MAIC, determines liability for claims when the vehicle "at fault" is unregistered or unidentified and manages such claims from injured persons. While the relevant legislation mandates milestones for claims processing, the ND sees significant behavioral and performance variations in CTP claims processing, affecting the costs and durations of claims. The reasons for these variations are poorly understood.

Situation Faced

The legislation governing the CTP scheme, includes certain provisions for the establishment of a claim by an injured person with a CTP insurer. The provisions prescribe the time that may elapse between when the injured person's notifying the insurer of his intention to claim compensation by lodging a Notification of Accident Claim (NOAC) form following the occurrence of an accident involving a motor vehicle and when the insurer receives the claimant's NOAC form and determines whether the claim complies with the legislation, the insurer will meet the injured person's rehabilitation expenses, and the insurer is liable for the claim.

The Act also requires that the insurer, after receiving the claimant's NOAC form, make a fair and reasonable estimate of the damages to which the claimant is entitled in an action against the insurer, and make a written offer of settlement, or invite the claimant to do so. A party who has received an offer must indicate acceptance or rejection of the offer within 3 months. Under the Act, failure to respond provides the party that made the offer the option of making application to the court.

Once the claim has been established, the time required to reach settlement is generally driven by the claimant's willingness to settle the claim and/or the claimant's reaching a point of medical stability. The Act also makes provisions for various forms of settlement negotiations.

The aims of the current study are to (1) identify process-related factors that affect claim duration at the ND, (2) investigate the differences in process behaviors for certain cohorts of claims that are of interest to the ND, and (3) identify sets of previously unrecognized context variables that affect claim outcomes in terms of duration and cost.

Action Taken

The BPM initiative took a process-mining approach that focused on the process identification, discovery, and analysis phases of the BPM Lifecycle. Automated process discovery and comparative performance analysis was undertaken with the aim of identifying where claims processing across cohorts of interest to the ND differed. In parallel, a context analysis was conducted with the aim of identifying the context factors that affect claim duration and cost.

The study had seven phases:

1. Domain familiarization (process identification).

2. Preparation of a set of context data.

3. Preparation of a claims data set.

4. Assessment of data quality and data cleaning.

6. Analysis of process performance.

7. Context analysis.

A critical success factor in any data-driven analysis is the selection and preparation of the data. The personal injury literature and interviews with representative ND staff informed the selection of data attributes.

Preparation of a Set of Context Data

The context data was grouped into attributes that relate to the accident in which the claimant was injured, the claimant herself, the claimant's employment pre- and post-accident, the claimant's injury type and severity, and legal aspects.

Assessment of Data Quality and Data Cleaning

Incorrect Timestamp

Distinct sets of activities that had timestamp irregularities included activities with only date values or with a date value only after a particular point in time or activities with "minute" values in the range of 1–12 instead of "month" values. These timestamp-quality issues had the potential to affect negatively both the process discovery analysis and the process performance analysis.

Incorrect Activity Name

Sets of activities that represented the same processing step but were recorded with different names for the activity and an unusually high number of activity labels in the source logs. The activity labels were constructed as the concatenation of two free-form text fields in the log. There were initially 3775 distinct pairs of the form fields in the log. Using string matching and consultation with domain experts, the 3775 label pairs were reduced to a set of 85 consistent activity labels.

Irrelevant Events

Irrelevant events manifested in the log as activities that could be performed at any time in the process and activities that occur multiple times in a claim as individual offers, were removed from the log.

Concept Drift

The changeover from a legacy claims-management system to the "Connect" claims-management system was revealed in the distribution of certain activities in the log and the granularity of timestamp recordings in event log records.

Results Achieved

The results achieved from the study, in terms of the process-mining results achieved and the outcomes the ND derived from the study.

Process Discovery

The initial model permitted behaviors that were not evident in the event log. The model was manually adjusted based on domain knowledge and verified by replaying the event log on the model to ensure that fitness remained high (approx. 80%). Achieving this level of fitness required the inclusion of many "silent" transitions that allowed activities to be skipped, including business steps that are not compulsory in all cases and some transitions to deal with differences between the legacy system and the Connect system.

Process Performance Analysis

In this phase of the study, the discovered process models and event logs were analyzed to determine performance differences between the claim cohorts of interest to the ND. The average time taken for a claim to reach certain key processing steps relative to a fixed

(starting) point in the process to measure performance. Only “finalized” claims were considered.

Unregistered Versus Unidentified Vehicles

The comparative performance analysis revealed that claims that involved an unregistered vehicle generally proceeded faster from notification through to making a liability decision than did claims that involved an unidentified vehicle. However, from this point on, the unidentified vehicle claims proceeded to finalization faster than the unregistered vehicle claims did, as the former were completed an average of 3.7 months faster than the latter.

Legally Represented Claimants Versus Direct Claimants

There are clear differences in the average time taken to reach key milestone events, as the cohort of direct- claimant claims take less time on average to reach the milestones than does the cohort of legally represented claims. This evidence indicates that the process changes that related to direct claimants had a positive effect on claims-management and process outcomes.

Context Data Analysis

Analysis of the context data was carried out using the RapidMiner modeling tool. The aim of one investigation was to identify a set of context variables that would be useful in predicting the duration of claims and the aim of a second investigation was to identify a set of context variables that would be useful in predicting the cost of claims. Supervised learning was used with the set of cases to undertake a binary classification of the cases as being “short” or “long” in the case duration investigation and “low” or “high” in the costs investigation. RapidMiner’s “binning by frequency” operator was used to split the data into the two categories for each investigation. The decision tree algorithm were able to distinguish between cases with short and long durations with 68.21% accuracy and between low-cost and high-cost claims with 83.15% accuracy.

Lessons Learned

This multi-faceted process-mining study presented many challenges and opportunities for refining the process-mining methodology and toolset. Data-related challenges arose because of the replacement of claims-management software during the study. Legislative changes, changes to key personnel, and the semi-structured nature of CTP claims-processing introduced issues related to concept drift. Each of these issues affected process discovery, but close collaboration with the stakeholders proved valuable in addressing these issues. The context analysis resulted in a set of indicator variables that can be considered predictors of claim behavior. Novel visualization techniques were developed to support delivery of insights gained through comparative analysis that will guide process improvement. A key lesson learned was that there are particular deficiencies in the process-mining toolset for conducting process-performance comparisons across cohorts of claims. Consideration of context considerably broadens the scope of process mining and facilitates reasoning about process specifics.

Impediments to Insurance Claims Processing (Nominal Defendant)	
General information	• MAI Act governs the Queensland compulsory third party (CTP) which is underwritten by four licensed, commercial insurers • The Nominal Defendant (ND), a statutory body established under the Act, manages claims when the vehicle at fault is unregistered or unidentified • Over the most recent three fiscal years, the ND received an average of 230 claims per year.
Intention	(1) identify process-related factors that affect claim duration at the ND (2) investigate the differences in process behaviors for certain cohorts of claims that are of interest to the ND (3) identify sets of previously unrecognized context variables that affect claim outcomes in terms of duration and cost.
Core element	Methods
Situation faced	• Processing injury-compensation claims is complex, as it involves negotiations among multiple parties. • The Nominal Defendant sees significant behavioral and performance variations in CTP claims processing, affecting the costs and durations of claims. The reasons for these variations are poorly understood.

Life cycle	process discovery
Actions	medications to the claims-management process: 1. changing how the ND engaged with its advising law firms by altering the fee basis of the engagement away from hourly rate to an agreed fee and encouraging a more collegial relationship in order to foster more in-house management of claims under advice from the supporting law firm, rather than outsourcing the management of entire claims to the law firm 2. encouraging claimants to manage their claims themselves, where appropriate, rather than engaging a legal representative. Further changes, particularly in the notification to liability decision phase of the claim, are envisioned for claims that involve unregistered vehicles.
Results achieved	• Process models were developed to facilitate comparative visualization of processes. The Nominal Defendant was particularly interested in differences in the processes for specific cohorts of claims: 1. overall claims 2. claims involving unregistered vehicles versus unidentified vehicles, 3. direct claims versus legally represented claims. The model facilitated identification of aspects of claims processing where there were significant differences between cohorts.
Lessons learned	• There are particular deficiencies in the process-mining toolset for conducting process-performance comparisons across cohorts of claims • The consideration of context factors broadens the scope of process modelling beyond simply uncovering sequences and durations of events to facilitate reasoning about process specifics and even predictions about process behavior. • There are significant differences related to investigations in the processing occur early in the claim process and differences related settlement and finalization occur toward the end of the claim process

15) Mining the Usability of Process-Oriented Business Software: The Case of the ARIS Designer of Software AG

Introduction

Software AG empowers customers to innovate, differentiate, and win in the digital world. The combination of process management, data integration, and real-time analytics on one Digital Business Platform enables customers to drive operational efficiency, modernize their systems, and optimize processes for smarter decision-making.

Traditionally, process models are generated by human modeling experts using modeling tools like the ARIS Designer, the market-leading BPM tool and one of Software AG's main products. The Software AG has applied expert interviews, pre-release usability tests, and other established usability methods in order to improve the ARIS software. Therefore, a comprehensive user experience (UX) approach was established that understands the user as a key to identifying and defining existing usability issues and to designing and testing possible solutions.

Situation Faced

In order to develop useful, efficient, and appealing products, Software AG defined a user-centric development process that is influenced by the ideas of design thinking, collaborative design, and lean UX. Embedded in an agile development environment, the process leans heavily on learning early and often.

The process starts with understanding the users and their problems. Methods like contextual interviews with members of the target group, surveys, and non-participatory observations are used to gather as much information as possible about the users' goals, tasks, and pain points. These methods also help the team to build empathy with the user and to keep the user in mind during the whole product-development process.

The first step generates many useful insights and considerable amounts of data and the second step creates a common understanding about the most important pain points in the process. The last step validates solutions by testing selected ideas with real users and real tasks. It is necessary to observe the users in their daily work without spying on them or measuring their performance. In addition, the costs incurred should be as low as possible.

Action Taken

The German Research Center for Artificial Intelligence (DFKI) and Software AG analyzed the issues in the currently available UX process at Software AG. A four-step approach based on process mining, consisting of user monitoring, trace clustering, usage model derivation, and usage model analysis was conceptualized and evaluated in a user study.

As a first step toward improving the existing UX approach in the intended way, alternative techniques for understanding and covering the state of the art are identified and analyzed in both business information systems engineering and software engineering. Adequate knowledge in all fields involved is required, as only then can the two disciplines be combined meaningfully.

Approaches from the field of usability engineering are expensive and they usually require a laboratory environment. The mining techniques that were used lean toward the rudimentary. The identified methods and techniques from the fields of process mining and usability engineering were analyzed with respect to their applicability in the given case. The relevant methods and techniques were consolidated in a four-step approach to understanding the user.

Design of the User Study

Several users were asked to work on tasks in the context of business process modeling using Software AG's ARIS Designer, Version 9. The study's objective was to learn how users act in reaching a solution.

A Four-Step Approach to Understanding the User

For the design of an adequate approach with corresponding tool support, the idea of process mining was adapted with regard to the specific requirements of usability engineering. The steps are: user monitoring, trace clustering, usage model derivation, and usage model analysis. In contrast to previous approaches, the steps can be applied during live operation, so they take real user behavior into account and expensive laboratory experiments are not usually necessary.

User Monitoring

Process execution data is the basis for business process usability mining. Depending on the analysis's objectives, the requirements for log data differ depending on the context.

When weak points in usability are identified, it might be helpful to log information like GUI information related to element positions and case-specific data. Collecting additional information may require the use of other data sources, such as an enterprise database, server logs or error logs.

Evaluation in User Study

In addition to the traditional log information of process mining which describes how the user triggers particular actions the objects involved are recorded as well.

Trace Clustering

The task of clustering traces within log data using a specific cluster criterion, including processes, resources/performance, cases, users, software. Therefore, the recorded log data can be interpreted as a multidimensional data cube whose dimensions are partially not known a priori.

Evaluation in User Study

Since the user study contains three exercises, in the trace-clustering phase the focus was on separating the log file based on the processes that are equivalent to that exercise. A basis for separating the log file was initially the known causal dependencies and afterwards the information concerning whether a user had experience working with ARIS.

Usage Model Derivation

Process mining distinguishes three fields of inquiry: process discovery, conformance checking, and enhancement. Process discovery seeks to derive a new process model based solely on log data, while conformance checking compares the as-is process to the to-be process. Enhancement focuses on the derivation of new information from log data in order to extend or improve an existing process model.

Evaluation in User Study

The Heuristics Miner was applied with default parameters to derive the usage models based on the clustered log files.

Usage Model Analysis

There are several possibilities for analyzing the usage model. Many metrics from a variety of research fields exist to characterize the model(s) and give first indications of weak points: model, process and usability metrics. These categories can be broken into subcategories, such as size and complexity in terms of model metrics or placement, and time aspects in terms of usability metrics. Other performance metrics may include achievement of objectives/conformance checking, causal dependencies, core and exception fragments, non-supported processes, system avoidance etc. Simple statistical indicators might provide hints concerning process or software usability issues. To calculate the metrics, a tool support was implemented, RefMod-Miner, in the research prototype.

Results Achieved

Despite the early stage of studying and applying the approach in a real context and although the number of participants in the user study was small, issues were identified, ranging from minor bugs and general weak points to specific user demands. The derived information was also sufficiently detailed to be described in a professional way and to be addressed with concrete improvements, which are currently being implemented.

The approach is highly flexible and scalable. Moreover, the graphic representation of usage models enables human observers to easily conceive the human interactions in a broad context and, thus, to replay critical cases in order to detect issues and develop possible solutions. Much of the work that is traditionally performed by usability analysts is done by the analysis tool. The necessary resources in terms of costs and time can probably be reduced significantly.

The developed method significantly enhances the capabilities of the UX work since it enables continuous screening of usability issues in a semi-automated way. At the same time, focused work is still important, especially in cases like those of developing new products or functionalities and redesigning existing ones.

Lessons Learned

Although the results are promising, there are still some aspects of the user study that remain to be discussed. First, the statistical relevance of the found issues and user demands to general user is currently unknown. Second, from a technical point of view, the amount of upcoming log data will require the use of methods that can handle it. Another challenge refers to the case of hidden tasks. Furthermore, it is necessary to train the end users and improve the software's usability based on the end users' needs.

A detailed analysis of the resulting data is challenging. Several ideas have been proffered to quantify the usability of a software system and process models, but these ideas are yet to be developed, conceptualized, implemented, and evaluated.

Moreover, it was shown that the developed method links the software-engineering view and the process-oriented view on business-process-supporting software, which suggests the potential for their design and further development and it can be applied to processes already in production and in real environments. The approach also significantly improves the overall UX approach by considered it as a broad and continuous lifecycle instead of a focused process with fixed start and end points.

ARIS Designer of Software AG	
General information	• Software AG is ranked as a leader in many innovative IT categories. • It has more than 4300 employees. • 70 countries • In 2015 had total revenues of 873 million euros.
Intention	The improvement of a user-centric UX approach based on the idea of automatic identification of real customer needs.
Core element	Methods
Situation faced	software producers invest considerable capital and manpower in improving their business software's usability with regard to customers' needs and process-related requirements. However, existing approaches from the field of usability engineering generally require laboratory environments, which do not cover the real user behavior without limitations.
Life cycle	process discovery
Actions	1. Design of the User Study (Identification and analysis of alternative techniques in both business information systems engineering and software engineering) 2. A Four-Step Approach to Understanding the User (Consolidation of the relevant methods) i. User Monitoring ii. Trace Clustering iii. Usage Model Derivation iv. Usage Model Analysis
Results achieved	• Identificationof several process-related software issues • Significant reduction of needed resources.

	• A promising alternative to the existing techniques of understanding was found, leading to important improvements regarding a comprehensive and continuous lifecycle.
Lessons learned	• Although the improved procedure had a promising performance for further application in production environments, there are some open questions. • Promising potential was identified, such as a mechanism for controlling the software's evolution, the inductive development of usage reference models. • An approach to measuring the ease of learning a new business software was developed.

16) Improving Patient Flows at St. Andrew's War Memorial Hospital's Emergency Department Through Process Mining

Introduction

Improving Emergency Department (ED) patient flows in terms of processing time, resource use, costs, and patient outcomes is a priority for health service professionals and is vital to the delivery of safe, timely, and effective patient care. If patients are not moving through the system efficiently, other patients may experience delays in accessing care, with possible deleterious consequences. Inefficiencies in patient flow may also raise the cost of providing healthcare services through the failure to make the best use of available resources. Recent years have seen an increasing demand for ED services in Australia's public hospitals without a corresponding rise in inpatient beds. Poor patient flows manifest as overcrowding in the ED, prolonged length of stay (LoS), patients "boarding" in EDs and "access block" for admission to inpatient wards. Consequences include poor patient outcomes, reduced access for new patients who present at the ED, and negative effects on staff, including dissatisfaction and stress.

The National Emergency Access Target (NEAT) was created to improve patient access to public hospitals' Eds. Performance against the NEAT is measured as the percentage of patients who physically leave the ED within 4h of their arrival. Although no state or territory, has consistently achieved its NEAT, the initiative has seen a reduction in average Length of Stay (LoS) in Queensland's public hospitals' EDs and has motivated changes in EDs' and wider hospitals' procedures. Two significant innovations have been the introduction of short-stay units attached to EDs, and the introduction of the Emergency Department Information System (EDIS), to record real-time admission/discharge information. Patient flows have been adopted as a management strategy to systematize the processing of patients from arrival at the ED to either discharge from the ED or admission to hospital. While patient flows alone cannot resolve all of the issues that affect equitable delivery of care to ED patients, improving patient flows has been shown to have a positive impact in terms of time, costs, and patient outcomes and is one of the key priorities in the healthcare domain.

Situation Faced

Processes in healthcare settings, especially in hospital EDs, are often semi-structured. Semi-structured processes are characterized by their lack of a formal process model. In the ED, while specific treatment plans for each patient can be designed after a triage assessment, the delivery of the treatment requires flexibility and ad-hoc decision-making because of regular disruptions in patient flows.

Disruptions to patient flows arise from such issues as those related to resources, teamwork, and external interruptions and manifest as long wait times, delays in administering/reporting on ordered tests, "boarding" of patients in the ED, ambulance ramping, and overcrowding in the ED.

Clinical pathways are standardized, evidence-based, multidisciplinary management plans that identify an appropriate sequence of clinical interventions, timeframes, milestones, and expected outcomes for a homogenous patient group. Clinical Pathways are guidelines made available to all hospitals, while patient flows are generally hospital-specific and devised by each individual hospital.

The usual sequence of events is for a patient's arrival at the ED to be recorded and then the patient to be triaged and then later by a member of the medical staff. To highlight the non-structured and patient centric nature of patient flows, in 45% of the cases in this study of patients presenting with chest pain, the patient was seen by a doctor before being triaged, a flow that is not in accordance with the typical pathway.

St. Andrew's War Memorial Hospital's (SAWMH) in Queensland, was particularly interested in identifying the differences between patient flows for the cohort of chest-pain patients who spent <4h in the ED from time of arrival to discharge from the ED compare to those who spent >4h in the ED. Of further interest to SAWMH was the impact of its practice of routinely requesting blood tests and radiological imaging of patients who present with chest pain.

The study was expected to deliver an objective evaluation of SAWMH's treatment practices for chest-pain patients, including a performance analysis with particular emphasis on factors that influence LoS in the ED. The ultimate aim was to identify potential improvements to patient flows that could contribute to improvements in SAWMH's performance against the NEAT.

Action Taken

A key challenge in deriving evidence-based improvements for patient flows is that of gaining insight into the process factors and context factors that affect patient flows. The case study reported here adopted the BPM Lifecycle reference framework to improve patient flows. In particular it focuses on the process identification, discovery, and analysis phases of the BPM Lifecycle.

Process Identification

Identify research questions that are relevant to SAWMH

Key challenge—With respect to the research questions of interest, define the relevant aspects of ED and hospital patient flows to be investigated

Key challenge—Identify relevant data from hospital information systems

Key challenge—Identify and resolve any data-quality issues evident in the extracted data so event logs aligned with the study's aims can be constructed

Process Discovery

Key challenge—Deal with the highly variable, patient-centric flow data to discover readable models that capture the dominant care paths

Process Analysis

Key challenge—Extract comparative process performance

Key challenge—Visualize comparative process performance

Results Achieved

Process models were discovered for the hospital's ED patient flow. From a control-flow perspective, only minor differences were observed between short- and long-stay patients at SAWMH, although there were timing differences in reaching specific milestone events. Waiting time in the ED following a request for hospital admission added significantly to overall ED LoS.

Process Discovery

The discovered process model represents the dominant pathways for the major milestone events in the patient flow for chest pain patients. The initially discovered process model for clinical activities was complex and unreadable. To discover a simpler process model for clinical activities, the set of activities was reduced to include only key activities from the Clinical table.

To address SAWMH's research question about process differences between the short-stay cohort of patients and the long-stay cohort, separate process models were discovered for each cohort. An area of interest to SAWMH was the relationship between routinely requesting blood tests and imaging for patients presenting with chest pain and the patient's overall LoS.

Blood testing for SAWMH is carried out by a third party pathology laboratory. The two organizations do not use a common patient identifier, therefore it was almost impossible to

match cases across the two systems and only a small sample of matching orders and results were obtained, which was too small for proper process discovery or analysis.

Process Analysis

Four primary observations with respect to the general ED patient flow and three primary observations with respect to clinical activities could be derived from the milestone events model. The process models show “direct follow” activities and reveal some differences in patient flows between short-stay and long-stay patients.

Extract performance-related information for each patient cohort and conduct comparative process-performance analysis (including visualizations)

There are observed differences in event timing between the short- and long-stay cohorts although the cause could not be determined. The waiting time in the ED following admission requests contributes significantly to overall LoS.

Visualize comparative process performance

This project highlighted the deficiencies in current approaches to comparative process-performance visualization. A parallel development of novel visualization approaches resulted in three styles of visualizations. The general model, that shows differences in performance, the superimposed model, that compares the process flows, and the side-byside comparison, that exploits the process model’s logical flow to describe temporal dependencies between activities.

Through a combination of process discovery, analysis, and novel visualization techniques, it was possible to detect differences in process behavior for cohorts of interest to SAWMH and obtain important insights. While it was not possible to determine the root cause of these effects, they form the basis for potential process improvements that would have direct impact on achieving the NEAT.

Lessons Learned

This project demonstrated that process mining is applicable to complex, semi-structured processes like those found in the healthcare domain. Comparative process performance analysis yielded some insights into ED patient flows, including recognition of recurring data-quality issues in datasets extracted from hospital information systems. The templated recognition and resolution of such issues offers a research opportunity to develop a (semi-)automated data-cleaning approach that would alleviate the tedious manual effort required to produce high-quality logs. The project highlighted the importance of hospital information systems collecting both start and end times of activities for proper performance analysis (duration, wait time, bottlenecks). Additions to the process-mining toolset include novel comparative process-performance visualization techniques that highlight the similarities and differences among process cohorts. These techniques are general enough to be applicable in a wider context, including to other hospital processes and to other domains.

Improving Patient Flows (St. Andrew's War Memorial Hospital)	
General information	Recent years have seen an increasing demand for Emergency department (ED) services in Australia's public hospitals.
Intention	The ultimate aim was to identify potential improvements to patient flows that could contribute to improvements in SAWMH's performance against the NEAT
Core element	Methods
Situation faced	There were Poor patientflows manifest as overcrowding in the ED, prolonged length of stay (LoS), patients "boarding" in EDs and "access block" for admission to inpatient wards. Consequences include poor patient outcomes, reduced access for new patients who present at the ED, and negative effects on staff, including dissatisfaction and stress.
Life cycle	process discovery
Actions	• Adoption of the BPM Lifecycle reference framework to improve patient flows. • Application of process-oriented techniques to real practices to discover models of current patient flows.
Results achieved	• There was no existing automated, intuitive way to perform process-

	performance comparison, particularly where multiple process models were involved. • Only minor differences were observed between short- and long-stay patients.
Lessons learned	• Process mining can be applied to a complex, semi-structured process like that found in a hospital ED. • Identification of a point in the overall process at which variations between cohorts of interest became most apparent. • There was no existing automated, intuitive way to perform process-performance comparison, particularly where multiple process models were involved.

17) CrowdStrom: Analysis, Design, and Implementation of Processes for a Peer-to-Peer Service for Electric Vehicle Charging

Introduction

In 2010, Germany's Federal Government announced the goal of one million registered electric vehicles (EVs) in Germany by 2020. Although this goal might be too ambitious, increasing the number of EVs that are fueled by power from renewable sources is still a goal worth pursuing in the effort to reduce global carbon dioxide emissions. Since EVs have a comparatively low range of distance, effective electric mobility must be built on an extensive network of charging points. An inadequate number of publicly available charging points is among the main reasons that consumers do not buy EVs. To address this problem, a peer-to-peer (P2P) sharing approach for private charging infrastructures was suggested. A joint consortium was formed between academia and industry to design and implement a web platform (via a research project "CrowdStrom") and an underlying business model for an infrastructure of individually owned EV-charging stations for public use. Currently, there are no standardized processes for EV charging, so they had to look elsewhere for processes that could be adapted or partly adopted as a foundation for the proposed web platform.

Situation Faced

An EV owner typically purchases a private charging point along with her EV in order to be able to charge the car more quickly than it is possible using a regular household outlet. Because there is usually only one user, these charging points tend to be underused. In the spirit of the sharing economy, the use rate and productivity of these charging points can be increased if they are rented to other people when the owners do not need them, an approach that would simultaneously increase the number of available charging points for other EV owners and make the purchase of an EV more practicable. This basic idea has been implemented in many peer-to-peer sharing and collaborative consumption (P2P SCC) business models, such as Airbnb (sharing of rooms) and Uber (sharing of cars).

A local utility, Stadtwerke Münster, aim is the development of a profitable business model for its charging infrastructure that can be integrated into its current PlusCard service environment and accounting infrastructure. *TÜV SÜD* is a German-based global certification and testing company that provides consulting services in the CrowdStrom project, on the development of data privacy, data security, and governance mechanisms in the business model and business processes.

Action Taken

The emerging domain of EV charging has brought organizations with a variety of business models and processes into the market. Therefore, instead of developing the necessary processes for the CrowdStrom web platform from scratch, other organizations' existing processes were analyzed for their suitability for CrowdStrom.

Stadtwerke Münster

The local utility Stadtwerke Münster introduced a radio frequency identification (RFID)-based customer card (PlusCard) for the authentication and payment of certain cashless services, including parking lots, taxis, and associated services.

Ebee Smart Technologies

Ebee develops and distributes components for setting up and managing charging infrastructures to customers who provide infrastructure as a service. Ebee acts only as a hardware provider, not as the operator of charging points. A similar business model with an extended focus on private providers is offered by PunktLaden.

Hubject

Hubject, is an IT service provider in the domain of EV and charging infrastructure integration that serves all of Europe. The Hubject IT platform is offering the possibility of eRoaming for

charging-point infrastructures and enabling the independent use of charging points by connecting existing isolated solutions.

ladenetz.de

ladenetz.de is a cooperation among municipal utilities with the goal of introducing, developing, and facilitating a well-developed charging infrastructure.

RWE Effizienz

RWE Effizienz offers the technical infrastructure and an extensive portfolio of services for the installation and operation of charging infrastructures.

sms&charge

The research project sms&charge developed a simple authentication and accounting system for charging stations.

The New Motion

The New Motion, develops intelligent charging points and advanced charging services for Evs.

Process Identification

Since the focus of this assessment is on the operation of the charging service and all related processes, identifying all processes from authentication to billing of the charging service was required. Four process categories—registration, authentication, charging, and billing—were identified as particularly critical in this context.

Registration

The registration process is the basis for all user-oriented and provider-oriented processes. It collects all of the involved persons' relevant data and initiates the contractual relationship between the company and the users and providers of the service. All subsequent processes are designed based on the initial registration.

Authentication

The purpose of authentication is to ensure that only eligible persons are granted access to the service so the provider is assured of receiving payment for the service. In most cases, the identification measure is a customer-specific ID that can be read and compared to a list of authorized IDs and unauthorized IDs.

Charging

The charging process starts after successful authentication and continues until a stopping event occurs. The transaction data must be transmitted and saved throughout the charging process, as they are required for subsequent billing processes.

Billing

Billing is considered from two perspectives in the context of CrowdStrom: the user billing that refers to the billing of services used by the user and the provider settlement that refers to the payment for services that a charging-point provider delivered to a user.

Process Discovery

Interviews were conducted with business professionals from the organizations identified. The questions focused on the identification of a process's systematic series of actions, the actors involved, and the master data and documents that were relevant to the process.

Process Modeling

Based on the interviews, 23 as-is processes in BPMN 2.0 were modelled. As expected, the organizations interviewed, handle their core processes differently, so there were identified up to five variants per process category.

Process Analysis

The modeled as-is processes were subsequently analyzed and used as a foundation for the derivation of to-be processes. Five best-practice process models out of nine core processes and additional details were derived from the information gathered.

Process Redesign

During the process redesign phase, the to-be process models were designed based on the identified best practices with regard to their applicability in the project context. The application of a P2P sharing approach to EV charging results in certain characteristics that differ from those of the established providers we interviewed.

Results Achieved

Registration

Since all of the providers that were consulted offered online registration—with the offline option simply an optional addition—the online registration was determined the best practice. The online registration collects data on the customer's surname, first name, address, e-mail address, and payment method.

The best-practice process identified was extended to include application for the CrowdStrom RFID card and the possibility of the customer's adding his or her own charging points and

becoming a provider. The partner concept requires a special process with which to add a partner's customers to the CrowdStrom database.

Authentication

The best-practice process in the context of CrowdStrom is the authentication via RFID card. It corresponds to the recommendation of the project partner Stadtwerke Münster, and it was the method of choice in a survey that measured the preferences of potential customers. An optional smartphone app that would enable authentication when users do not have their FID cards, thereby enhancing the customer experience.

Charging

The RFID card's ID is transmitted from the charging point to the central charging station controller at the company's backend, which verifies whether the user is eligible to start/terminate the charging process. When the verification is successful, the charging process is started/terminated centrally by the backend, ensuring that only eligible users can order the start/termination of the charging process.

Billing

Processes regarding end-user billing from Stadtwerke Münster and The New Motion were captured, both of which conduct user billing monthly and send a personal invoice; the only major difference is that The New Motion sends the invoice via e-mail, while Stadtwerke Münster uploads the invoice to its web portal.

Administration

Additionally to-be process models for administrative tasks were designed that are concerned with actions that the user can perform on the online portal. Required processes are concerned with registering a bank account, applying for an authentication card, registering

and removing charging points, changing opening hours, and eventually deactivating the user account.

Lessons Learned

Analyzing and then designing business processes to reach a common goal has been a unifying factor in this joint research project, where partners from industry and academia have differing backgrounds, expectations, and individual goals. BPM practices enabled the project team to create an innovative business model and corresponding business processes that will have an impact in practice.

CrowdStorm	
General information	• The Germany's Federal Government's goal is one million registered electric vehicles (EVs) in Germany by 2020 as an effort to reduce global carbon dioxide emissions • As of 2018, 5800 public charging points at 2500 public charging stations are available • Joint academia-and-industry research project "CrowdStrom" to counter the problem of demand with insufficient supply vs supply with insufficient demand
Intention of project	Establishment of a well-developed network of publicly accessible charging stations that can help to accelerate the diffusion of EVs
Core element	Information Technology
Situation faced	• Inadequate number of publicly available charging points with many isolated small providers • Interconnection of existing charging providers requires the adoption if the general P2P SCC paradigm
Life cycle	process analysis
Actions	Analysis of other organizations' existing processes for their suitability for CrowdStrom and implementation of the BPM lifecycle for the analysis and the redesign
Results achieved	Modeling and implementation in a software prototype of sixteen to-be processes that comprised registration, authentication, charging, billing, and

	administration Evaluation for validity and effectiveness
Lessons learned	• Unifying factor in this project among different research groups: analyzing and designing business processes • BPM practices helped to create an innovative business model and corresponding business processes that will have an impact in practice

18) Enabling Flexible Laboratory Processes: Designing the Laboratory Information System of the Future

Introduction

Flexibility has become an increasingly desirable corporate capability, particularly in the services industry, which is the largest and most rapidly growing business sector in many industrial nations. Recent developments in the medical and industrial laboratory market have increased the need for highly flexible laboratory processes. This pressure results from new requirements that have accompanied the internationalization of laboratories and the digitalization of paper based, bureaucratic work practices. The execution of laboratory processes is supported by laboratory information systems (LISs), which handle the control and information flow of incoming orders end-to-end. State-of-theart LISs do not feature sufficient flexibility-to-use and flexibility-to-change capabilities. To prepare medical and industrial laboratories for the challenges ahead, LISs require more advanced flexibility capabilities that meet the need for flexibility in complex laboratory processes.

Situation Faced

The laboratory process consists of all steps from order entry to accounting of the laboratory service. After an order is made, the samples to be analyzed and the specification of the required examinations arrive at the laboratory. The laboratory analyzes and tests the samples and summarizes all test results in a single report per order. A laboratory physician then validates the results, checks the report for plausibility, and adds further diagnostic information if needed before the laboratory transfers the validated results back to the customer. Finally, the laboratory charges for the services provided in line with current price lists and regulations.

Many content- and market-related factors affect the nature of the laboratory process. The BPM context framework offers guidance in characterizing relevant contextual factors, particularly the factors of repetitiveness, knowledge-intensity, interdependence, and variability.

The laboratory process is generally characterized by repetitiveness. The processing of samples is highly standardized and automated. The accounting of laboratory services also follows complex but strict guidelines, so there is little need for manual interaction and creativity. Pattern-detection mechanisms support or replace physicians' work in validating diagnoses.

The current situation in the medical and industrial laboratory market has pushed LIS providers to redesign their systems substantially in order to enable flexibility. For examples, with blurring national boundaries medical and industrial laboratories must consider increasing numbers of country-specific regulations that increase complexity and their processes' need for flexibility. Currently available LISs are too inflexible to cover laboratory processes' future demands for flexibility, so MELOS, a technological leader in the field of medical and industrial laboratory software solutions, and the project group Business and Information Systems Engineering (BISE) of Fraunhofer Institute for Applied Information Technology (FIT), a research institute that is experienced in the development of custom-tailored applications, initiated their collaboration in the Laboratory Information Systems for the Future (LIS4FUTURE) project to develop a process-aware LIS with a modular software architecture and a rule-based configuration mechanism.

Action Taken

To enable functional flexibility of laboratory processes, the LIS4FUTURE project team designed and implemented a process-aware LIS into which are integrated a modular architecture and a rule-based configuration mechanism. The project team iteratively developed the LIS4FUTURE demonstrator following an agile software development process in order to respond quickly to changes from newly identified requirements. The team used the LIS4FUTURE demonstrator to validate the developed concepts' applicability in real-world scenarios. The LIS4FUTURE project was comprised of four major phases. These phases were conducted iteratively and in an interleaving manner following the agile software development principles.

Phase 1: Engineering Requirements

In this phase of the project, the project team raised and structured requirements for the design of a process-aware LIS by analyzing the laboratory market, the state of the art in the related BPM and computer science literatures, and the architecture and components of the MELOS LIS.

Phase 2: Designing the Process-Aware LIS

Given the requirements identified in the project's first phase, the LIS4FUTURE team designed a process-aware LIS that enables advanced flexibility-to-use and flexibility-to-change.

Phase 3 and 4: Developing and Evaluating the Demonstrator

The project team implemented and refined the LIS4FUTURE demonstrator in the course of an agile software development process. The LIS4FUTURE demonstrator focuses on implementing the essentials of the modular software architecture and those of the rule-based configuration mechanism while enabling the developed concepts' applicability to be validated based on real data.

Results Achieved

The actions taken in the LIS4FUTURE project resulted in the design of a process aware LIS, prototypically realized in terms of the LIS4FUTURE demonstrator. As a preparatory task, the need for flexibility in complex laboratory processes and extracted requirements for technological support by a process-aware LIS, considering content-related and market-related context factors were reviewed.

Modular Architecture

To incorporate flexibility-to-change capabilities in future LIS, a modular software architecture was designed that facilitates the LIS provider's ability to add new functionality easily via modules.

On the architectural level, modules can be added or replaced with significantly reduced effort. Although new modules still require the LIS to be partially recompiled, existing modules can be activated or deactivated during build time. Moreover, modules need only a well-defined interface and a service level agreement that specify the communication and interaction standards, and other modules can use this interface to communicate with one another. Furthermore, as a positive side effect, the modular software architecture is not restricted to the laboratory process but can be extended easily to other supportive LIS functionalities.

Configuration Mechanism

A rule-based configuration mechanism was designed to support ongoing process adaption and LIS adaptation through flexibility-to-use capabilities. The configuration mechanism covers most of the laboratory process's flexibility requirements in terms of routing and calculation decisions, based inter alia on examination results and price lists.

Rules enable LIS users to modify the process definition at runtime. Based on this foundation, all or selected currently running process instances can be migrated to a new process definition that is, for instance, requested by an external stakeholder. The configuration mechanism also includes plug-ins to add functionality that simple rules cannot cover.

Summary

The modular software architecture and the rule-based configuration mechanism enable the future LIS generation to be highly customizable. Their practical application was confirmed by

the LIS4FUTURE demonstrator. Whereas the modular architecture focuses on flexibility-to-change by allowing for the insertion or the replacement of modules, the configuration mechanism provides flexibility-to-use by enabling rules to be adapted and plug-ins to be added. Together, these two concepts help to address future requirements regarding the functional flexibility of laboratory processes by reducing the customization effort in daily business operations and facilitating procedural and technological innovation. Accordingly, LIS providers and laboratories can react to content-related and market-related context factors with a manageable level of effort.

Lessons Learned

To meet the upcoming flexibility requirements of laboratory processes, the project team developed and implemented the LIS4FUTURE demonstrator, a process-aware LIS with a modular architecture and a rule-based configuration mechanism. In so doing, the project team had first-hand experiences that can be classified into process-specific, architectural, and organizational lessons learned.

Lessons Learned from the Process Perspective

Lesson 1: Rely on both flexibility-to-use and flexibility-to-change IS capabilities to prepare for future flexibility requirements on the process level.

Lesson 2: Incremental improvement is not always sufficient to achieve a target.

The LIS4FUTURE project radically redesigned the software architecture and many modules of the MELOS LIS, particularly the accounting module. Radically rethinking existing modules and the architecture opened up completely new opportunities.

Lessons Learned from the Architecture Perspective

Lesson 3: The software architecture must be aligned with process thinking.

A modular and process-aware architecture was designed that substantially decreased the effort required in implementing changes and increased the potential of long-term-oriented flexibility-to-change, such as the replacement of entire modules.

Lessons Learned from the Organizational Perspective

Lesson 4: Discussions among academics and practitioners are more effective if they build on running prototypes instead of theoretical concepts.

Lesson 5: If you want your team members to communicate, co-locate them.

Since all MELOS developers worked at the same location anyway and were not familiar with distributed work environments, this measure significantly helped the project team get to know each other and to give feedback more directly and openly.

Flexible Laboratory Processes	
General information	• Flexibility is an increasingly desirable corporate capability • Typical laboratory process: 1. order entry 2. examination 3. validation of the examination results 4. transmission back to the costumer 5. accounting of and billing for the order • The execution of laboratory processes is supported by information systems • Laboratory processes have considerable need for flexibility because of their content and market-related complexity • The laboratory information systems (LISs) handle the control and information flow of incoming orders end-to-end.
Intention of project	Establishment of a well-developed network of publicly accessible charging stations that can help to accelerate the diffusion of EVs
Core element	Information Technology

Situation faced	• Increased demand for highly flexible laboratory processes due to internationalization of laboratories and digitalization of paper-basedwork practices. • Leading edge LISs do not feature sufficient flexibility-to-use and flexibility-to-change capabilities and therefore require more advanced flexibility capabilities
Life cycle	process redesign
Actions	MELOS, (leading German LIS provider) and BISE (Project Group of the Fraunhofer FIT) conducted the LIS4FUTURE project which resulted in a process-aware LIS with modular architecture and a rule-based configuration mechanism. Phases: 1. Engineering Requirements (analyzing the laboratory market, the leading BPM and computer science literatures, and the architecture and components of the MELOS LIS) 2. Designing the Process-Aware LIS (building a solid core which paved the way for flexibility-to-change laboratory processes) 3. Developing the Demonstrator (implementation and refining of the LIS4FUTURE demonstrator in the course of an agile software development process) 4. Evaluating the Demonstrator (discussing the progress of the process and taking feedback from the stakeholders to improve the software)
Results achieved	design of a process-aware LIS, prototypically realized in terms of the LIS4FUTURE demonstrator Focus on 2 major deliverables that enable the future LIS generation to be highly customizable: 1. modular and process-aware software architecture with largely independent modules 2. rule-based configuration mechanism that enables laboratory employees to customize by changing the LIS without recompilation and redeployment
Lessons learned	• from the Process Perspective 1. Rely on both flexibility-to-use and flexibility-to-change IS capabilities

	to prepare for future flexibility requirements on the process level 2. Incremental improvement is not always sufficient to achieve a target • from the Architecture Perspective 1. The software architecture must be aligned with process thinking • from the Organizational Perspective 1. Discussions among academics and practitioners are more effective if they build on running prototypes instead of theoretical concepts 2. If you want your team members to communicate, co-locate them

19) Managing Environmental Protection Processes via BPM at Deutsche Bahn

Introduction

Deutsche Bahn, one of the largest construction facilitators in Germany, seeks to remain a profitable market leader and to become one of Germany's top ten employers and an eco-pioneer. The law demands environmental compensation for interventions in nature and landscapes through the Federal Nature Conservation Act. Deutsche Bahn encounters several hundred new such compensation obligations per year. Deutsche Bahn plans and develops compensation measures that usually require long-term maintenance. The Federal Railway Authority demands regular reports on the state of these obligations. Prior to the beginning of the case study described here, Deutsche Bahn had no IT system that could meet these requirements.

This case study describes how Deutsche Bahn met these requirements as part of a Business Process Management (BPM) project and how the project culminated in the launch of the Information System for Nature Conservation and Compensation, known as FINK. The core of this web-based application is a BPM System (BPMS).

Situation Faced

The requirements for quality-assured implementation and ongoing maintenance of compensation obligations and their annual reporting to the Federal Railway Authority led to the establishment of a new project that Deutsche Bahn called 'Compensation Obligations'.

The steering committee started the Process Identification phase, as one work package dedicated to the target process. Later in the project they took the stakeholders systematically through all phases of the model: the Discovery, Analysis, Redesign, Implementation, Monitoring, and Controlling of business processes.

At the time, there were few corporate compliance guidelines for compensation obligations. Each of Deutsche Bahn's business units was developing its own protocols, and processes were defined only for certain segments of work. No end-to-end process was described. As none of the Deutsche Bahn's business units had software to keep track of the company's obligations systematically, all documentation for planning, implementation, and maintenance of compensation obligations was paper-based. Environmental planning documents were not kept separate but were part of the technical files and were stored in filing cabinets after the project conclusion.

One of the first project tasks was to define the content and format of future reporting in conjunction with the Federal Railway Authority and the various Deutsche Bahn stakeholders. It became clear early in the process that an efficient software platform was needed to fulfil this reporting commitment.

Action Taken

In view of the situation faced, Deutsche Bahn decided on an action plan with three project phases.

Preliminary Study: First Half of 2013

Creation of a preliminary study to provide recommendations for process redesign, a suitable IT-infrastructure, and key requirements of the IT system.

The econauten, a team of external experts who specialise in digitising business processes, led the effort to improve the status quo and the search for weaknesses and potential remedies. The developed BPMN 2.0 model proved to be suitable for visualising the various stakeholders' perspectives. The standardised and formalised presentation of the process helped workshop participants to comprehend which processes were unique for particular departments and which were essentially the same activities with different titles. The

modeling work motivated the departments to agree on a common language and a standardized process.

In a second workshop, large-format prints of the current process formed the basis for a qualitative process analysis. Several key requirements for the IT system were derived from specialist workshops in conjunction with evaluation by Deutsche Bahn's legal department.

A completely new IT system had to be developed from the ground up with three primary characteristics:

• Web-based.

• Open Source.

• Process Automation.

Proof-of-Concept: September 2013 Until July 2014

Development of a proof-of-concept to demonstrate the chosen system architecture's feasibility.

It was necessary to set up the IT project to address the requirements. DB Systel GmbH, which would later operate the system, took over the project management. DB Systel opted for an iterative approach based on the agile method Scrum. Organisational and technical prerequisites were established in order to apply Scrum in a practical manner. The participants met to discuss and assign the typical Scrum project roles were discussed and assigned.

A web application based on Liferay was developed, and custom-designed input forms allowed users to input data regarding compensation obligations. This information was stored

in a database in the background. In the next step, the BPMS Camunda was connected to the portal.

Over the following weeks, the new IT system was developed in 2-week sprints.

After the end of each sprint, the Product Owner examined the implemented functions and processes via a test system.

System Development: September 2014 Until Spring 2016

Development and rollout of the productive system.

After seeing the proof of concept, the decision committee approved the further development of the system. User Stories were written, prioritised, and implemented by the development team, and pilot users' experiences were used to improve the reporting process, masks, and the data model itself. Based on the User Stories and the high-level target process developed earlier, five additional processes for managing the new IT system were identified.

Before the roll-out of the productive system, the project team and future users tested the system.

Results Achieved

The FINK project was initiated to engage intensively with the process of compensation obligations at multiple levels in Deutsche Bahn. An interdisciplinary team of environmental experts, process experts, and software engineers developed FINK using agile methods. FINK is a hybrid of a BPM system and a web-based data application. Internal staff from all of the DB business units that are responsible for compensation obligations now have full access to FINK, as do their external consultants. The implementation of a roles and rights concept ensures that users can access only the system functions that are specific to their

entitlements. DB Environment stipulated that the user management be based largely in the business units themselves. Today, segment administrators manage all accounts within their business units, setting up new users and assigning appropriate roles.

The demand for an IT system was the starting point for the project. While this demand could have been satisfied with classic software development, the experts opted for a software architecture in which a BPMS runs as the core application. The key concept of a BPMS is to execute logic described in business process models that can be changed easily, so system behaviour can be changed whenever business processes change, whether the system is in development or in operation. What users particularly like about FINK is that it supports their specific work contexts. With BPMN it was easy to model who participated in a process, in which particular role they acted, what decisions were necessary, and what tasks had to be completed.

In the future, and with little extra effort required, the revision of quality rules could be transferred entirely to the specialist departments, which now define the criteria for data quality and document these rules in Excel spreadsheets.

Lessons Learned

For BPM projects to be successful, specialist departments must have sufficient expertise.

Specialist departments are typically faced with challenging demands with respect to IT projects, especially BPM projects, as the responsibility for their success lies increasingly with the departments themselves.

The parties involved recognize the benefits of BPM only when the depicted processes are relevant to them.

In order for an organization’s BPM initiative to fall on fertile ground, the first process to be implemented should be chosen wisely.

Adding systematic quality checks to processes can easily be achieved using DMN.

• Quality must be contextually defined in rules.

• Compliance with these rules must be systematically and automatically checked.

The fulfillment of monitoring, documentation and reporting compensation obligations is significantly simplified with a BMPS.

Adopting this approach made it easy to extract relevant information automatically for documenting and verifying obligations directly from the BPMS.

The standard compliant JAVA Process Engine and Portal Solution are good choices in the development and deployment process.

Development and operation of this BPM application is no different from that of other Java enterprise applications, so the risk of unexpected side effects is predictably low. Since all of the components are Open Source, the risk of a software vendor lock-in was reduced and access to the large Open Source developer community was possible.

Successful BPM initiatives are anchored in the organization as change projects BPMS projects.

BPMS projects are equal parts organizational and IT projects, but IT is no longer necessarily the dominant partner, as it is seen to be on equal footing with other organisational areas.

Environmental Protection Processes (FINK)	
General information	• Deutsche Bahn AG: One of the leading passenger and logistics companies • Operating in 130 countries • By the end of 2016, Deutsche Bahn had about 4000 such obligations, with several hundred being added every year
Intention	improve nature and species conservation, so when building new lines or upgrading old ones,

	the natural habitat will be unaffected from the beginning of the planning process
Core element	Information Technology
Situation faced	• Deutsche encounters several hundred new such compensation obligations per year as demanded by the law through the Federal Nature Conservation Act • The compensation measures that usually require long-term maintenance whilst the Federal Railway Authority demands regular reports • Deutsche Bahn had no IT system that could meet these requirements
Life cycle	Process implementation

Actions	1. Creation of a preliminary study to provide recommendations for
	  • process redesign
	  • a suitable IT-infrastructure and
	  • key requirements of the IT system
	2. Development of a proof-of-concept to demonstrate the chosen system architecture's feasibility
	3. Development and rollout of the productive system

Results achieved	• Analysis of the most recent version of the report process • Fewer resources were required as time went on • Users can gradually correct the data until the desired quality is reached • Supports user's work context

Lessons learned	• For BPM projects to be successful, specialist departments must have sufficient expertise
	• The parties involved recognize the benefits of BPM only when the depicted processes are relevant to them
	• Adding systematic quality checks to processes can easily be achieved using DMN
	  ○ Quality must be contextually defined in rules.
	  ○ Compliance with these rules must be systematically and automatically checked
	• The fulfilment of monitoring, documentation and reporting compensation obligations is significantly simplified with a BMPS
	• The standard compliant JAVA Process Engine and Portal Solution are good choices in the development and deployment process
	• Successful BPM initiatives are anchored in the organization as change projects BPMS

20) Hybrid Process Technologies in the Financial Sector: The Case of BRFkredit

Introduction

Exformatics, a Danish adaptive case-management vendor, wanted to leverage declarative process tools to support the flexible processes found at BRFkredit. In order to accommodate the diverse requirements of BRFkredit's process models, Exformatics extended its declarative modeling tools to derive from any model representative traces and other relevant flow-based visualizations. Through this extension, the tools now support a hybrid modeling approach in which processes are modeled declaratively based on their underlying business rules, but the behavior supported by the model can be visualized in more familiar flow-based notations, both in full and as representative traces. However, switching from the more common flow-based notations to a declarative notation brought new challenges in terms of understandability. The project described in this chapter was undertaken to investigate and address these challenges.

Situation Faced

Knowledge-worker end users are the experts and should be inhibited in their possible actions only if required by law or business rules. As the academic literature often claims, Exformatics contends that declarative notations are better suited for describing such laws and business rules than imperative or flow-based notations are.

However, declarative notations have been shown to be more challenging for end users to understand than are more common flow-based notations, such as BPMN. Hence, the primary objective of the investigation for Exformatics was to determine how the DCR Graph process modeling can be made more accessible to expert end users. A secondary objective was to determine the motivation for and role of manual process modeling in financial institutions and the applicability of DCR Graphs to the same. Another secondary objective was to carry out a practical test of the hypothesis that potentially collaborative simulation can be a useful tool for expert end users' work with process models. Exformatics places a high priority on support for simulation in its tool offerings, contending that the ability to

simulate and “play through” a process will help users understand the ramifications of a particular declarative model.

The Context of BPM in BRFkredit

Viewed in terms of the BPM Context Framework the focus of BPM initiatives at BRFkredit has been on exploitation, that is, using process models primarily to help case workers determine how to handle their cases while remaining compliant. Both core processes and support processes are modeled. As BRFkredit targets regular consumers with standardized loan options, most processes are highly repetitive. Processes are typically highly knowledge-intensive, and the case workers are required to have a deep understanding of the mortgage products offered. A medium level of creativity is required of the workers. There is a medium level of interdependence and the processes at BRFkredit are highly variable.

Most of the processes at BRFkredit are inter-organizational. As a mortgage institution as while the loans can be seen as products, they are not physical products. The culture at BRFkredit is highly supportive of BPM practices, with BPM diagrams of important processes adorning the hallways around the case workers’ offices, so a significant amount of the organization’s resources is dedicated to creating and maintaining these diagrams. Finally, the BPM activities at BRFkredit are performed in a medium-level competitive environment with a medium level of uncertainty.

Related Work

The direction taken in this project relates closely to the recently initiated work on hybrid business process modeling notations and technologies that seeks to combine the strengths of the flow-and constraint-based process modeling paradigms. A common approach in this field is to provide hybrid modeling notations that combine both flow-and constraint-based elements. This approach, on the other hand, uses the two paradigms separately: a constraint-based notation is used to model the process, whereas a flow-based notation is used to gain insight into the behavior supported by the models.

Action Taken

The investigation took the form of a sequence of full- and half-day meetings to discuss BRFkredit's requirements. Based on these requirements, it was proposed and developed a prototype hybrid process modeling approach with which models are defined declaratively, but the possible behavior of the model can be viewed and investigated using flow based notions. The prototype was then presented to BRFkredit for feedback.

Different Stakeholders Use Different Notations

Attempts to introduce a small subset of BPMN as a standard modeling notation used everywhere in BRFkredit have not been successful. Most departments, including IT, find that notation unhelpful, not because those stakeholders are adverse to process modeling but because some departments have produced their own extensive and comprehensive models of their processes for internal consumption.

These models appear to have two primary commonalities across departments: the models are trace models and the models heavily emphasize roles, whether occupied by humans or IT systems. In a large company like BRFkredit, difficulties in agreeing on notation go beyond process notation.

The differences in model notations and terminology have the unfortunate consequence that two diagrams, one depicting a process as seen by IT and one as seen by sales, may result in the observer's failing to realize that the two diagrams depict aspects of the same process.

The Level of Abstraction Appropriate for a Model Depends on the Stakeholder Who Uses It

Each stakeholder needs a different part of a process description and does not need to know details about other parts of the process and therefor the model should provide different views of the same process to the various stakeholders.

Regarding Differences in Notations

The differences in the process notations employed at BRFkredit arise from the absence of a single notation that is suitable for all stakeholders. They envision a mechanism for presenting process models in terms of a small number of representative traces. This idea fits well with the idea of declarative or constraint-based process modeling: A declarative model is a concise representation of a typically large number of admissible traces with semantics that allow us to compute efficiently whether a trace is admissible. If BRFkredit's processes were represented as a single or, more realistically, a small number of general processes, one could extract from these models representative traces that "represent" the process in internal communications.

The process's objective can be defined as the execution of a particular activity and the process's variants can be identified by which activities are executed in pursuit of that objective.

Regarding Differences in the Appropriateness of Abstractions

For the single-trace model representatives suggested above, determining the appropriateness of an abstraction is simply a matter of projecting the trace in question, that is, leaving out activities that are unwarranted at the desired level of abstraction.

For DCR graphs, the possibilities for semantically well-founded projection has been well studied, so getting rid of "human interactions" in amounts to employing one of the known sound projection methods.

Results Achieved

Their investigation helped to clarify the requirements for making declarative process models understandable to end users at BRFkredit and showed how a hybrid approach could be used to satisfy these requirements. Based on these insights, they developed tools to enhance

their existing declarative modeling framework with flow-based visualizations. These tools provide perspectives on the process model depending on the stakeholder to be using it.

Lessons Learned

Different stakeholders have different needs and preferred levels of abstraction when process models are used as tools for communication. However, one model that seems to fit most situations is a simple no-branches sequential swim lane diagram that was extracted automatically from a more detailed declarative model. These observations enabled Exformatics to enhance its declarative modeling framework to make it more attractive to end-users. Exformatics propose that there is a clear opportunity for hybrid process modeling approaches that provide different views of the same process to the various stakeholders of a process. Exformatics has made a first step in this direction by incorporating functionality for the semi-automatic generation of "representative traces" in their declarative modeling tool, but there are many opportunities for improvements, both in terms of tool-development and research.

It is not clear yet if the notations chosen by Exformatics are those best suited to the hybrid approach. Finally, it would be interesting to investigate the possible application of hybrid models to other parts of the BPM lifecycle, such as process implementation, monitoring and discovery.

The case of BRFkredit (Exformatics)	
General information	• Exformatics: Danish adaptive case-management vendor • customer base of approximately forty organizations
Intention	Application of its declarative workflow modeling and execution engine in the financial sector
Core element	Information Technology
Situation faced	• Adoption of declarative process tools to support the flexible processes found at BRFkredit • switching from the more common flow-based notations to a declarative notation brought new challenges in terms of understandability for the end users. • Objectives: 1. determine how the DCR Graph process modeling can be made more accessible to expert end users

	2. determine the motivation for and role of manual process modeling in financial institutions and the applicability of DCR Graphs to the same 3. carry out a practical test of the hypothesis that potentially collaborative simulation can be a useful tool for expert end users' work with process models
Life cycle	Process identification
Actions	1. a prototype hybrid process modeling approach was proposed and developed with which models are defined declaratively 2. the possible behavior of the model could be viewed and investigated using flowbased notions. 3. The prototype was presented to BRFkredit for feedback
Results achieved	Extensionof the existing workflow modeling tool with a proof-of-concept analysis tool that presents projected traces generates minimal traces that are executing or not executing given activities.
Lessons learned	1. BRFkredit uses process modeling primarily as an internal communication tool. 2. Different stakeholders have radically different uses for the resulting process models 3. Different stakeholders prefer somewhat different process notations 4. Many stakeholders are content with representing processes as "representative traces." 5. Such representative traces should contain only activities that are relevant to the business case at hand

21) Business Process Management in the Manufacturing Industry: ERP Replacement and ISO 9001 Recertification Supported by the icebricks Method

Introduction

A family-owned manufacturing company went through the transfer of management from the older to the younger family generation. The new management wanted to improve the company's production processes and safety record. Moreover, management wanted to empower the development of new products and services in order to enter new markets and become more independent and diversified. Overwhelmed with these far-reaching change initiatives, the new owners needed support in structuring and organizing the modernization activities. A number of problems were uncovered during the takeover process, such as prevalence of tacit knowledge, an inefficient decision-making process, outdated IT system support, and an urgent need for certification of production processes according to quality-assurance standards (ISO 9001). Each of these problems required thorough documentation of the as-is business processes in the organization to guide their improvement.

Situation Faced

Lack of Process Documentation

The missing process documentation of the company, was a major shortcoming and a barrier to effective knowledge management. When the new generation took control, they understood that everyone in a management position had to know the core company functions and to have at least a general understanding of the processes in the organization's various departments. This idea led to the decision to start a process-modeling project for the documentation of as-is processes. The main requirements for the documented processes were comprehensibility and completeness. The company wanted each documented process to capture the process owners, to offer textual process descriptions, and to be accompanied by known weaknesses and potential for improvement. Besides representing the chronological order of activities, the process descriptions had to incorporate the IT systems' and organizational support's perspectives.

Outdated Information System Support

The existing ERP software had been introduced in the company in the year 2000 and suffered from a wide range of functional and usability problems. The company admitted that the ERP system lacked certain functionalities, which led to inefficient and ineffective decision-making and management. Moreover, since the most communication with the company's large customers was performed through the ERP system interface, the system had to function flawlessly, which was not the case with the existing ERP software. The company's employees often complained about the incorrect price listings or erroneous calculations performed by the CRM module. The new owners wanted to replace the outdated software, but before starting the process of selecting and implementing a new ERP system, they had to know which processes had to be automated and to what extent. Moreover, it was sensible to perform at least some process improvement before the introduction of new ERP software.

Outdated Quality Assurance

The ISO 9001 recertification with the latest standards of production processes in terms of quality and safety at the workplace through production and quality-assurance process documentation was a goal.

Action Taken

Preparation for Process Modeling

The BPM project had three major goals: (a) creation of clean and resilient business process documentation that the company's management and employees could understand and use, (b) implementation of the new SAP Business One ERP system with follow-up end-user training, and (c) recertification of the company's production processes according to the ISO 9001 quality standard.

The icebricks modeling method and tool were chosen for the simple syntax and structure of its modeling language, predefined layers of abstraction, a semantic standardization approach using domain-specific glossary, and the use of attributes for storing related process information.

Framework Construction

The company's process landscape was created during an initial workshop between the executives and external BPM consultants. The revealed processes were organized graphically in a logical order, forming a company-specific process framework. The definition and acceptance of the process framework has significant influence on the overall modeling project's chances of success, as it provides structure and orientation for the modeling team and helps the model users to navigate efficiently through the process landscape. All of the high-level processes that had been identified were classified into management, support, and core processes. The icebricks modeling tool was easily applied to the creation of the framework. Its modeling language is based on the principle of abstraction, which is an inherent characteristic of every model-creation process.

As-Is Modeling

The information on processes in the company's various departments was gleaned from semi-structured interviews with the department employees. At the same time, process weaknesses and potential improvements were derived and discussed with the functions' management. Finally, the interview information was transferred from the consultants' notes into a form that was easily accessible by the modeling team in order to allow for continuous process improvement during the project and by the company afterward. One of the most important requirements to the as-is process models was their simplicity so they could be understood easily. The icebricks method uses just two modeling elements: activities and a control flow. For the control flow are used single-level branching with an arbitrary number of successor elements. Use of this simple element set resulted in clear and understandable process models.

Process Analysis and Improvement

After the creation of the as-is process models, the information about weaknesses and improvement potentials that was extracted from the semi-structured interviews and information from the literature and experiences of the involved consultants were used to develop improved to-be process models. The focus of these to-be models was on all three of the projects' goals.

Results Achieved

During the modeling phase of the project, the company's knowledge and good-practice processes was documented. The process landscape served as basis for well-informed decisions regarding the implementation options of a new ERP system, which was introduced on time and on budget in the second phase of the project. The ISO 9001 recertification of production processes was achieved in the third project phase with the help of the process documentation that had been created. The company achieved all three of the project's goals.

Process Documentation

After the consultants formally handed over the process descriptions to the company, the new management had a complete and optimized process documentation at their fingertips. From this point on, the manufacturing company's IT department could use the web-based modeling environment for continuous process improvement. The simplicity of the icebricks method facilitated employees' participation in the investigation of the process models, identification of potential improvements, and maintenance of the defined attributes for the process steps.

ERP Replacement

The SAP consultants relied on the harmonized to-be processes that were directly accessible in the web-based environment to align the ERP system to the desired behavior. This affordance reduced the communication effort with respect to workshops and interviews between the SAP consultants and the company's employees. Hence, the SAP consultants were able to present a system prototype with the expected system behavior in less time than they anticipated, based on their project experience with less-documented companies. This accomplishment was a main driver in introducing the SAP Business One solution within budget and with satisfactory quality in only 1 year. In particular, the company's management appreciated the increased functional range provided by the new system in perfect alignment to the processes.

ISO 9001 Re-certification

The ISO certification had some challenges in terms of the necessary adjustments of the mostly optimized production processes. After overcoming these challenges, the improved and documented to-be processes fully satisfied the requirements of the ISO 9001 quality standard, with some minor remarks for further improvements in on-the-job safety. The ability to view and export the process documentation easily using the icebricks modeling tool eased the certification process.

Continuous Process Management

After the project's successful conclusion, a work group made of representatives of the company's middle managers was established to discuss the company's processes regularly and to identify the additional improvements and adjustments necessary for the company to keep pace with its dynamic market.

Lessons Learned

From a general, methodological point of view, the selection of a web-based, lightweight modeling tool and a method with a high degree of pre-structuring helped to save time and budget. Simply deploying process models on the company's intranet platform does not necessarily lead to their desired comprehension and use. All employees have to be trained that process models are a means of communication and are never finalized, a notion that also applies to continuous process improvement. Process owners must be defined so they take responsibility for adjustments to the process environment beyond the project's lifecycle, but such responsibility is not solely that of a project manager. Furthermore, the project demonstrated the appropriateness of the icebricks modeling method for the manufacturing domain, although it was originally designed for the retail industry. The use of the employees' knowledge about possible improvements was valuable, input for the optimization of the as-is and construction of the to-be processes. The year-long experience of the department workers and use of appropriate facilitation techniques in to-be process construction workshops often bring results similar to those of complex analysis techniques but with fewer resources invested.

The case of BRFkredit (Exformatics)	
General information	• Exformatics: Danish adaptive case-management vendor • customer base of approximately forty organizations
Intention	Application of its declarative workflow modeling and execution engine in the financial sector
Core element	Information Technology
Situation faced	• Adoption of declarative process tools to support the flexible processes found at BRFkredit • switching from the more common flow-based notations to a declarative notation brought new challenges in terms of understandability for the end users. • Objectives: 4. determine how the DCR Graph process modeling can be made more accessible to expert end users 5. determine the motivation for and role of manual process modeling in financial institutions and the applicability of DCR Graphs to the same 6. carry out a practical test of the hypothesis that potentially collaborative simulation can be a useful tool for expert end users' work with process models

Life cycle	Process identification
Actions	4. a prototype hybrid process modeling approach was proposed and developed with which models are defined declaratively 5. the possible behavior of the model could be viewed and investigated using flowbased notions. 6. The prototype was presented to BRFkredit for feedback
Results achieved	Extention of the existing workflow modeling tool with a proof-of-concept analysis tool that presents projected traces generates minimal traces that are executing or not executing given activities.
Lessons learned	6. BRFkredit uses process modeling primarily as an internal communication tool. 7. Different stakeholders have radically different uses for the resulting process models 8. Different stakeholders prefer somewhat different process notations 9. Many stakeholders are content with representing processes as “representative traces.” 10. Such representative traces should contain only activities that are relevant to the business case at hand

22) Why Are Process Variants Important in Process Monitoring? The Case of Zalando SE

Introduction

Business process models serve various purposes. Rapidly growing multinational companies in the e-commerce sector in particular must overcome challenges in business process management in order to scale up their businesses and reach ambitious business goals, so business processes in this sector are largely automated.

Business Process Management at Zalando

In 2012 the company set out to document its core processes in a structured way and decided to develop and tailor to their needs their own ERP system, Zalando E-Commerce Operating System (ZEOS). All departments involved contributed to the precise documentation of the relevant business processes using BPMN. One year later, they began to use the documented business processes for operational tasks. Eventually their efforts led to the integration of an open source BPM engine and the first fully automated business process's going live early in 2014. Since then, they have continuously increased the automation of their processes and found significant value in detecting anomalies in the execution of their processes, including non-automated and hard-coded behavior. BPM has become one of the driving forces and key factors of success in Zalando's endeavor to become a widely used platform that connects people with fashion beyond its core business.

The Role of Process Monitoring

Enabling process monitoring requires that process models contain all of the business logic required by underlying business scenarios and that they consider processes across the IT landscape and organizational boundaries. Doing so typically results in a large number of detailed and complex process models that capture all possible cases.

To detect and resolve problems with a business process rapidly, all process instances must be monitored. Here, the term process variant refers to all possible paths in a process model that must be monitored. Different process paths are triggered by parameters like the shipping or payment method chosen. Analyzing process variants, shows opportunities to increase the quality of process models from a semantic point of view.

Situation Faced

The business process, modeled using BPMN, consists of one parent process and three sub processes. The original models consist of 20–100 elements and contain both basic and advanced process modeling structures, such as error-handling, process hierarchy, and attached boundary events. All process steps are executed sequentially; that is, the business process contains no concurrency. Along the process, several measurement points were established for which the monitoring system records the time and process data.

Action Taken

Variants of a business process originate from points in the process model where the control flow might diverge, such as at decision gateways and racing events. They systematically identify the underlying semantics to choose from a set of alternative paths and characterize the resulting variants. This effort offers the opportunity to reduce the variability in business processes, that is due to modeling errors, inconsistent labeling, and duplicate or redundant configurations of these points, and increasing the consistency within it.

Variants in Business Processes

A process variant is a complete and unique sequence of activities, events, and decisions carried out in compliance with a business process model. Every process instance of this model belongs to exactly one process variant.

Identification of Process Variants

All model constructs that yield alternative outcomes lead to a set of process variants such that each alternative adds another process variant. In the case of BPMN, such constructs can include exclusive gateways and interrupting boundary events.

Characterizing Process Variants

A small number of process variants is not problematic for process monitoring, as not every activity, event, or decision is tracked by a monitoring system.

Reducing Process Variants

One goal was to remove variants whenever possible to ease process monitoring.

Zero Variants

One of the first reasons that process variants are triggered is paths in the process model that can never occur, which are called zero variants. All paths with zero variants must be refactored to increase model quality.

Duplicate Variants

A configuration parameter (CP) is a variation dimension and a trigger parameter (TP) denotes a variation point in the process model that uses Cps. A number of checks are carried out to identify duplicate and redundant TPs, duplicate trigger configurations, and merging of events.

Duplicate Trigger Parameters

Duplicate labels of TPs are identified and marked, but corresponding points in the model are not yet refactored, as there is a chance of finding replicas of the TP, and duplicate labels do not necessarily imply duplicates, as the CPs for these TPs must also coincide. The labeling style focus on a best practice approach.

Redundant Trigger Parameters

The next check focusses on TPs that can be eliminated, which will decrease the number of variants.

Duplicate Trigger Configurations

Identification and documentation of duplicate and redundant TPs are the first steps toward understanding why variants occur. The next step toward reducing process variants is analysis of CPs, which are used to split up a business context. CPs are bound to TPs by assigning information about the business context. A TP that is linked to a specific process model element determines the process' behavior based on the information from a CP.

Merging of Events

In some cases, variants were triggered by two or more message-receive events that indicated the same business trigger but differed in the data payload and can be treated as a single instance.

Results Achieved

For a sub-process of an order-to-cash process from the e-commerce industry, 59244 variants were discovered, of which only 360 variants lead to a successful continuation of the process. The remaining variants cover exception handling and customer interaction. These variants

are crucial in terms of customer satisfaction and must be monitored and controlled. Using a set of methods, reduced overhead in the process and normalized decision labels, thereby significantly increasing the process model's quality.

Handling Zero Variants

Refactoring took place in the handling of "zero variants" and was performed without changing the process semantics from a business point of view. The number of variants must be computed again after model refactoring.

Handling Duplicate Trigger Parameters

Duplicate TPs were detected in the first part of the order-to-cash process. Some of these Tps were adjusted according to best practice naming standards but some Tps could not be renamed because of their reuse in IT systems.

Redundant Trigger Parameters

Although process models are checked for quality, TPs may be modeled in a redundant way, so their approach detects these triggers and applies remediation. The number of variants that are due to TPs can multiply throughout the process, such as when there are sub processes, so saving even one variant locally can reduce the global number of variants significantly. Large reductions could be achieved in practice, the effect is so large because the removal of a single TP may affect the complete process hierarchy.

Duplicate Trigger Configurations

Variants are created based on TPs, so the evaluation of process variants also includes determining the configuration of those TPs, revealing the underlying conditions. In order to refactor the process model, one must determine why the same business context, that is, the set of CPs, is applied to TPs with different labels. The main reasons were errors in process

models and a gap or mismatch between modeling and interpreting business information. Process experts and domain experts clarified how to remediate this discrepancy by deciding upon the TP and updating the label of the other to match the context if necessary. Then duplicate TP entries can safely be eliminated, which reduces the number of variants.

Merging Events

With regard to process monitoring, it is reasonable to merge events. In many cases, the benefit of reducing variants outweighs the cost of maintaining two models.

Lessons Learned

An approach was introduced to characterizing and reducing variants in business process models based on the notion of TPs and CPs that provide insight into the data and logic that is applied when control flow diverges within the process model. The semantic quality of the process model increases as a result. This reduction effort involves a structured approach that considers all variants of a business process, rather than focusing only on the most frequent or most important cases. Even domain experts and model experts were surprised, but they ultimately understood why reducing the number of variants is needed in order to activate process-monitoring solutions quickly and efficiently.

Process Variants (Zalando SE)	
General information	• Many companies focus on established methods to design, analyze, control, and optimize their business processes and to ensure high levels of customer satisfaction and close alignment with IT systems • e-commerce sector companies must overcome challenges in business process management in order to scale up their businesses • business processes in the e-sector are largely automated • consistent and scalable process monitoring and process controlling helps firms to detect problems, derive remediating actions and to address these problems quickly
Intention	reduce the number of process variants by performing behavioral analyses
Core element	Information Technology
Situation faced	There is a quantity of variants in complex business processes, that can impede the activation of process monitoring so companies want to reduce the number of process variants by performing

	behavioral analyses
Life cycle	Process analysis
Actions	1. Defining process variants (complete and unique sequence of activities, events, and decisions carried out in compliance with a business process model) 2. Deriving Process Variants throw an a priori verification process 3. Characterizing process variants (and comparison between them) 4. Reducing process variants (zero, duplicate, duplicate Trigger Parameters, redundant Trigger Parameters, duplicate Trigger Configurations, merging of Events)
Results achieved	• 59,244 variants were discovered, of which only 360 variants lead to a successful continuation of the process. The remaining variants cover exception handling and customer interaction. • While these variants do not lead to a successful outcome and might not qualify for the "happy path" of this process, they are crucial in terms of customer satisfaction and must be monitored and controlled. • The number of variants were reduced to 11,000. • The actions reduced overhead in the process and normalized decision labels, thereby significantly increasing the process model's quality.
Lessons learned	• No Exclusion of Variant (Implementing monitoring solutions often requires focusing first on important parts of a business process) • Bias for the Happy Path (In process analyses 100% of the process variants must be monitored) • Automation for Analyses (different orderings of interwoven activities must not be considered as distinct variants if they follow along the same paths in the process model) • High Number of Process Variants (the final number of process variants was surprisingly high and reducing them is needed)

23) Adoption of RFID Technology: The Case of Adler—A European Fashion Retail Company

Introduction

Adler Modemärkte AG is a fashion retailer that operates mainly in the German-speaking countries. At the beginning of the twenty-first century, first movers in the fashion retail sector began to adopt RFID technology. Adler monitored this new technology and decided to adopt it in 2010, even though it was not sure at that stage whether its use would be profitable. The potential of RFID to provide benefits like highly transparent logistical processes, improved in-store replenishment, and more effective electronic article surveillance (EAS). As increasing numbers of the company's competitors transitioned to radio frequency technology for the purpose of source tagging and theft prevention and there was a dramatic drop in the cost of tagging items with RFID labels, the visionary ideas from 2002 finally became practicable in 2010. Changes in the company's infrastructure, such as replacing the exit gates, were overdue to improve theft prevention, so management decided to use the opportunity to make a full transition to RFID technology.

Situation Faced

The adoption of RFID technology at Adler was driven less by the need to solve problems than by the potential benefits of the new technology. The Business Process Management (BPM) Context Framework was used to describe the situation the company faced.

The Goal Dimension

Even though RFID is seen as an innovative technology, Adler's main goal was to improve its existing processes. To distinguishing between articles on the sales floor and articles in the stockroom, with RFID technology, a fixed scanner could be installed between the stockroom and the sales floor to scan the passing items automatically, requiring only that the employees traverse the gate carefully to ensure high accuracy in the system.

The Process Dimension

Adler redesigned its structured repetitive core processes based on the needs of the RFID technology. One potential process improvement was at the goods-receiving step. With RFID, apparel delivered on hangers are scanned with a handheld reader in an instant, and the stock management system captures the new goods. Boxed items can be scanned in one batch.

The RFID technology also promises significant process improvements for the point-of-sale process. Now, however, the RFID-enabled tags can be read in a batch when a number of items are placed on the checkout desk. The cashier needs only to count whether all items were detected by the system and does not have to look for barcodes. Employees and suppliers with the previous electronic article-surveillance system had to perform a time consuming process to apply (and remove) the hard tags. Finally, the RFID technology speeds up manual inventory counts, as RFID handheld scanners can simultaneously detect hundreds of items.

The Organization Dimension

Intra-organizational processes were most of the project's focus. However, in order to fully leverage the benefits of RFID technology, some of the company's third-party suppliers also had to change their barcode-based processes.

The Environmental Dimension

BPM is important for Adler because the high level of competitiveness in the retail fashion sector makes streamlined processes that waste no resources essential. Customer demand is difficult to forecast in the industry, which leads to some uncertainty. In addition, new developments in RFID technology require rapid modification of existing processes in order to realize the new technology's full benefits.

In summary, RFID allows a retailer to conduct inventory checks more frequently using handheld devices, leading to earlier detection of misplaced, lost, or stolen items. In such cases, employees can replenish the missing items from the stockroom or order them. Consequently, the chance of lost sales opportunities is reduced, as customers are less likely to encounter situations in which the items they want are not on the shelf. Not only is anti-theft protection increased because the RFID tags and can be attached to more items than was possible with the previous technology with hard tags, but the RFID tags are cheaper.

Action Taken

Careful planning is required if the goals and promises of RFID are to be achieved. With the help of a consultancy, Adler managed the adoption of RFID as a project that began in 2010 and spanned 2 years.

Concept and Provider Selection

In a first step, Adler's project management team and a hired consulting firm analyzed the requirements of the Adler's envisioned solution and required RFID equipment and processes. In 2011 Adler selected its Weiterstadt store as a test store and a suitable provider for the required hardware and tag supply.

Concept Realization and Preparation for Rollout

Next, a conceptual prototype was set up in a test environment to validate that the components all worked together as expected and were ready for use in the stores. The pilot project began in Weiterstadt in the spring of 2012. The store was equipped with all systems, such as the chosen RFID enabled handheld devices and RFID printers, and all garments were tagged with RFID transponders. Afterwards, the pilot was expanded to provide a broad dataset that verified the positive results from the first pilot in Weiterstadt. The IT infrastructure for handling the RFID events and providing monitoring and reporting was set up in summer 2013. Simultaneously, the stores were equipped with handheld devices for

uses from inventory counting to tagging of new items. The RFID gates and scanners were planned in autumn 2013. Important monitoring points for the processes in retail stores are points at which items enter and exit the store, the transition between the sales floor and the stockroom, and of course the point-of-sale counters. The goods-receiving process was almost completely automated with scanners. The automatic processing frees the staff to focus on core processes like assisting customers.

3.3 Rollout

One essential step in the use of RFID technology is the tagging of all the items in the store. This step required 9 months, from July 2013 until March 2014, and considerable effort. Meanwhile, the stationary readers were installed so employee training and go-live could be performed in succession.

The new technology was rolled out in more than 170 stores. Adler began by equipping four stores per week with RFID technology. Then, with more routine and first lessons learned, the company was able to double the pace to eight stores per week. The rollout was smooth and saw no further delays or complications, so Adler stayed on plan and completed the rollout by April 2014, 5 months ahead of schedule.

Results Achieved

The adoption of RFID technology at Adler was strategically relevant to the company's management. Besides economic factors, the modernization and the more efficient checkout process positively affects the company's brand image. Most of the project's goals were achieved. Better inventory accuracy and transparency of the flow of items between the back of the store and the sales floor. The higher inventory accuracy in the system supports an increase in the turnover. Improved follow-up procurement is enabled by improved inventory accuracy. Increased process efficiency was achieved in the management of items. Also, faster processing at points of sale. The speed-up in service at the points of sale was due to two changes in the process. First, the RFID tags allow the employee to batch-scan the customer's items. Second, the manual step of removing hard tags is dropped with the

introduction of RFID tags. Consequently, the gain in efficiency at the points of sale results in lower queuing times and, thus, in higher customer satisfaction. Furthermore, source tagging and theft prevention by means of RFID technology. Instead of costly hard tags that were attached by suppliers and removed at the point of sale, lightweight and affordable RFID tags are mounted on each item's price tag. The introduction of RFID technology clearly resulted in reduced retail shrinkage.One of Adler's goals—improving the goods-reception process—was not completely achieved because of some of the suppliers' incomplete coverage of items with electronic product codes. Adler is currently working on this issue.

Lessons Learned

Careful planning is required when conducting large improvement projects, including delegating responsibilities, as consultancy companies are specialized and experienced in managing such transition projects; doing an early check on the feasibility of process improvement projects; waiting for the right moment to conduct the project; and considering the project's critical risks and people's sensitivities.

RFID (Adler case)	
General information	• Adler ModemarkteAG : fashion retailer and one of the leading textile retail chains in Germany • In 2015, it operated 177 stores in Europe with also an online store • more than 4000 employees • 27 million items sold per year
Intention	migrating to the novel and improved processes that advocates of RFID technology promised with the main goal being to improve the existing processes
Core element	Information and Technology
Situation faced	• Since other in the fashion retail sector began to adopt RFID technology, Adler started to monitor this new technology. • The transitioning costs were high so the company had to hold until 2010 in order to adopt the RFID technology even though it was not sure at that stage whether its use would be profitable. • Adler hoped to improve process efficiency and effectiveness in the long run to increase customer satisfaction through faster checkout and prevention of theft
Life cycle	Process monitoring and controlling
Actions	• Hire a consulting firm and together analyze the company's and customer's requirements, including

	an analysis of the existing ERP system • Selection of the suppliers and set up of the placement of readers and processes • Realization of the RFID technology • Tag of all the items in store and training of the employees • Additional training and software releases after the completion of the RFID implementation
Results achieved	• Better inventory accuracy • Improved follow-up procurement • Increased process efficiency • Faster processing at points of sale • Source tagging and theft prevention
Lessons learned	• Careful planning is required when conducting large improvement projects, including delegating responsibilities • consultancy companies are specialized and experienced in managing such transition projects • doing an early check on the feasibility of process improvement projects • waiting for the right moment to conduct the projectconsidering the project's critical risks and people's sensitivities • RFID has paid off for Adler and will serve as a basis for further process optimizations

24) Automate Does Not Always Mean Optimize: Case Study at a Logistics Company

Introduction

Most industries today automate their processes via workflow systems. Extraction of this data is an enormous challenge because of the existence of many systems, which store data in many formats. What is needed is a team of people who will monitor all of the resource processes for each activity and record the individual steps that provide solutions to their problem areas. Thus, the team will be able to create a visible and interactive process model with dedicated timeframes for the people involved with each activity. The logistics company examined here has fully automated its Purchase Order and Invoice Approval processes, driven by a BPM system.

Situation Faced

The logistics company is dealing with large numbers of invoices and purchase orders, covering their transportation business as well as overhead expenses. Scanning, automatic recognition, and data extraction and processing of invoices was the first solution the company needed. It was also important to implement a purchase order management system and document management system for storing, searching, and management of the documents.

The key element was workflow automation for the Purchase Order and Invoice Approval processes based on the digitized version of the documents involved. The benefits of implementing the solution were clear after short period of operation. The new invoice-approval process allowed the company to forego hiring the additional personnel and to process twice the number of invoices with the same personnel. The rate of lost invoices and invoices not approved on time fell to a negligible rate. The new purchase order approval process eliminated the need for double approval in most the cases. The company wander whether it was possible to optimize its processes further.

Process Definition

To identify the flow of processes and subsequently validate the extracted process models, processes are implemented in a process-driven application and driven by a workflow engine.

Purchase Order Process

The system provides the users the ability to create a new order in the form of editable structured forms. It is automatically launched into the Purchase Order process and the system then selects a tree of authorized users/group of authorities to approve it and assigns the approver/approvers tasks by email notifications. After approval the system decides whether the stock level is sufficient and, if not, it initiates a reselection process. This process is repeated until all approvals have been acquired and an order gets a status Approved or Declined. With approved orders it continues and assigns tasks to authorized employees that confirm either a completed delivery order or a partially delivery or even a cancellation from the customer. When a partial delivery takes place, the employee can wait for delivery of missing parts of the ordered goods or declare the order as partially delivered (and it is marked as “Closed”).

Invoice Approval Process

The Invoice Approval process is automatically prompted when an invoice is scanned/digitized. First, the system automatically assigns invoices to the correct order based on the order number. If the order is not found, the system will generate a task for manual entry of the order. The order is paired with its invoice and the system automatically compares the total amounts.

The Invoice Approval process has the same procedures as the Purchase Order process. The system generates tasks to confirm the accounted invoice and to complete the accounting part/accounts payable process of the invoice. However, if the employee finds irregularities, the process will continue, and the system will generate tasks to resolve them.

Action Taken

Data had to be extract from the company's databases (and other data sources e.g. logs, ERP) and be saved in a suitable format. Dealing with legacy and a variety of interconnected systems requires additional effort to correlate events (related to each other). Events must be ordered per case, thus not requiring timestamps, but when merging data from different sources depend on timestamps. Another challenge is the scoping of the event log. The granularity of logged events is also an issue in the system, as some systems produce low-level events. There are several approaches to preprocessing these types of events.

Event Log Extraction

Event logs are extracted via a developed connector that extracts event logs from a process-driven application that ensures a proper process-monitoring functionality. Activity, events, and their metadata distinguish the monitored processes, and data from runtime parts in the database were extracted.

Design-Time Data

For the individual processes defined, information is available regarding the date of implementation, actual running versions, and the historical record of previously implemented versions. In addition, all process have defined their activity sessions/lines and their metadata. For individual activity, corresponding events are defined as one of two types: human (and relevant information) or system.

Runtime Data

Each released process instance contains unique identifiers. Unique identifiers and the foreign key for a process instance in which it took place are recorded for activities carried out in the process. For individual events, timestamps are recorded and the human activity

type holds the employee that performed the activity. Metadata related to process, activity, and event instances are linked via specific foreign keys.

For the Invoice Approval process, user comments data was extracted to identify the most frequent reason for refusal of invoices and the case status, which helped to reveal the differences between completed, running, error, and deleted process instances.

Logs were stored in .CSV files. Events are recorded in an automatic, systematic, reliable, and safe manner. Given such recording, the reconstruction of the processes did not require pre-processing of the data. The connector developed enabled the export of the process instances according to the design-time information.

Process-Mining Techniques

The goal of process mining is to discover, monitor, and improve processes by extracting information from event logs. Because of the possibility of a large volume of data, the commercial tool Minitfor the process analysis was used, as it offers the most modern process-discovery algorithm, which is similar to fuzzy mining.

Results Achieved

The overall goal was to reconstruct and analyze process models from an event log.

Control Flow Identification

Processes' main streams were identified as their most numerous variants. A process variant is defined as the presence of unique activity sequences.

Purchase Order

In the order-approval process, five of the most numerous variants accounted for 88% of the overall behavior.

Invoice Approving

Four of the most numerous variants accounted for 89% of the overall behavior in the Invoice Approval process. The most frequent behavior and performance properties were revealed. Both processes have a common bottleneck, where multi-level approvals take place. Both processes had a remarkable growth in throughput time when multiple approvals took place.

Points of Interest in the Purchase Order Process

Areas were identified in which processes are seen that hold statistical value or performance problems, focusing on the approval of purchase orders, the people involved in the process, and their social network.

Approval Level

Activity seen in this section pertains to the approval of purchase orders. All orders must be approved when the approver can do so the first time (or request additional information).

Resources in the Process

Over-allocated resources were discovered in the Purchase Order process. Process owners were advised to relieve over-allocated resources. The research also revealed that some employees had to communicate with a larger number/group of employees to process purchase orders. Over-allocated resources are clearly shown in the social network of the Purchase Order process. Over-allocated resources were more likely to take longer than average to complete an activity.

Suppliers' Characteristics

The time that it would take to deliver goods/services and the likelihood that the order would be completed was predicted. This information helps process owners accurately plan and schedule orders for the delivery of their goods/services.

Points of Interest in the Invoice Approval Process

Text-mining techniques were applied to see the most common causes of rejected invoices.

Manual Entry of Order Numbers

The system identifies invoices with incorrect or missing IDs. For unidentified invoices, the system allocates tasks among the staff to enter correct order numbers manually.

Resolving Rejected Invoices

Invoices can be rejected at the first level of approval or at the payment-processing stage. Rejected invoices either ended or the problem is corrected and the process begins again. The work habits of the most efficient employee could be presented to the other employees to improve their effectiveness. Also the process owner,in order to establish the most common grounds for refusal regarding invoices, use a frequency analysis of phrases.

Lessons Learned

Today's businesses are process-driven; everything done in a business is a process. A process-driven application is a software that provides automatic execution of business processes and logs the executed activities. Most systems have design-time data that defines the processes and runtime data that includes information on executed activities. One can use connectors to extract the data in the desired process log structure. Process mining techniques allow us to reconstruct the process from logs, analyze it, and find optimization points. Processes can

be analyzed from several perspectives: as human to human processes, human to system processes, and system to system processes.

Automate Does Not Always Mean Optimize (Logistics)	
General information	• Most industries today automate their processes via workflow systems • when automating processes, companies must monitor them to see what takes place to enhance the processes so they meet changing business needs and eliminate risks
Intention	Automation and enhancement of processes
Core element	Information and Technology
Situation faced	• rising numbers of invoices and purchase orders • The company needed scanning, automatic recognition, data extraction and processing of invoices and management systems
Life cycle	Process discovery
Actions	• Data extraction from the company's databases • Pre-processing of the data • Data analysis
Results achieved	• identified the structure for stored data and the attributes attached to the metadata of the processes • imported newly created process logs into a process mining tool • introduced a process model and its statistics based on the extracted processes • pointed out characteristics and points for improvement in individual human activity
Lessons learned	• businesses are process-driven today • most systems have design-time data that defines the processes and runtime data that includes information on executed activities • connectors can be used to extract the data in the desired process log structure • process mining techniques allow us to reconstruct the process from logs, analyze it, and find optimization points • processes can be analyzed from several perspectives

25) Integrate Your Partners into Your Business Processes Using Interactive Forms: The Case of Automotive Industry Company HEYCO

Introduction

For some time, companies have been using information technologies like EDI and online portals to support the exchange of data with their business partners. The benefits of using IT in B2B have been confirmed by many studies. The automotive industry company HEYCO-WERK Heynen GmbH&Co.KG wanted to improve how it handled purchase order confirmations. Its purchase department spent a lot of time entering incoming purchase order confirmations from its vendors into its SAP system. This process had to be automated with the most suitable technology to make it more time- and cost-efficient.

Situation Faced

The company produces hand tools, plastic parts, and forgings. Many components from various vendors at home and abroad are needed for the manufacturing process, and goods for maintenance, repair, and operations (MRO) are purchased from a number of suppliers. The company has integrated some of its most important vendors into its business processes using EDI solutions, but PO confirmations for delivery dates and quantities were not yet processed automatically. In fact, the data transfer by EDI supported less than 2% of all current suppliers. A solution for a more efficient handling of confirmed delivery dates and quantities in the ERP system was needed.

The time required to enter a confirmation for one PO item averaged 150s, so more than 500h of work could be saved per year by automating this process.

Action Taken

The first step was choosing a suitable technology to support the process with as many vendors as possible. They considered three types of solutions for automating the process.

One-to-One

One-to-one technologies include those that are used to integrate each partner individually. These connections are characterized by a mutual exchange of information and efficiency gains for both sides. However, establishing these connections requires that each partner make certain investments.

One-to-Many

One-to-many technologies enable companies to integrate their partners in a flexible way, without extensive coordination. These technologies can be implemented by portals, online platforms, or e-marketplaces integrated into the enterprise's ERP system. However, these technologies usually force the interacting partner to enter the required data into a web form manually, so efficiency gains from eliminating a media break are mostly those of the company that implemented the technology.

Interactive Forms

Interactive forms are electronic forms generated from an enterprise application that contain both application-specific data and interactive elements like input fields and dropdown lists. Users can enter data into the forms and save them in a structured way, that consequently can be extracted and automatically processed in the source application and initiate other processes. Interactive forms can also be dynamic. In contrast to the web forms that are used in typical one-to-many scenarios, completing an interactive form does not require an internet connection, as all data and scripting are usually embedded in the form. Hence, interactive forms have advantages in converting paper-based scenarios to electronic processes. What's more, most users are well acquainted with Adobe forms.

Comparison of the Technologies

To find the most suitable technology, a comparison scheme was developed consisting of six indicators.

Evaluation of Return on Investment (ROI): Project managers must always be able to explain how a new solution generates significant benefits for the company. One-to-one and interactive forms have advantages over one-to-many technologies the ability to evaluate ROI.

Process Expertise and User Acceptance: The use of technologies in B2B often leads to significant changes in the process. Interactive forms can be handled offline, so they do not require much training and are likely to be more readily accepted by users than are other B2B technologies.

Flexibility describes how easily a new partner can be integrated using the solution. Implementation makes sense only if a high volume of data is exchanged between partners and if the business relationship is stable, so one-to-one is preferred for strategic partners. For partners to participate in a one-to-many solution, it is usually sufficient that they log on to an online platform with a provided user name and password, which is even easier with interactive forms, as everyone who receives and completes a form can take part in the process.

Partner Acceptance: There are two sides in B2B, so the partner must willing to take part in the process. In dealing with one-to-one technologies the partners faces the same challenges as the company itself, so only partners with a high volume of data exchange are likely to accept the required investment. On the other hand, partners have to enter data into a web form manually. Like one-to-many technologies, interactive forms avoid media breaks only for the company that generates and processes them, but interactive forms' ability to be managed offline gives them some advantages over web forms.

The highest Level of Automation can be achieved by one-to-one technologies, as data exchange that is free of media breaks can be possible if the systems of both transaction partners are integrated with each other. On the other hand, one-to-many technologies have limited capabilities to automate processes because data processing is automated on only one side. Interactive forms perform poorly in this regard.

Functional Scope describes the range of functionalities offered by a technology to support the interaction between companies. One-to-many technologies are the most powerful in terms of functional scope, as they have access to almost unlimited resources. Nearly every type of application could be developed based on these platforms.

HEYCO's requirements for choosing a software were that:

• the necessary investments be justified;

• purchasers could use the technology without intensive training;

• even B- and C-partners with low volumes of data to exchange could be integrated into the system.

One-to-one technologies were first excluded because of their lack of flexibility. One-to-many technologies and interactive forms can integrate all types of partners because of their advantages in terms of flexibility and partner acceptance. Purchasers preferred interactive forms compared to portal solution because of the ROI. It was more important to HEYCO to support the core process with a computable cost-benefit ratio. In addition, with interactive forms the original process flow changes very little. Finally, higher ratings in terms of flexibility and partner acceptance make interactive forms more suitable for integrating nearly every partner. The supplier does not need any specific technical skills but just completes the received form and sends it back.

The new PO confirmation process is a simple, linear procedure: The vendor enters the confirmed delivery dates, quantities, and its order confirmation number, so the interactive form covers only one process step.

Implementation of the Scenario with Interactive Forms

The solution was created using a rapid prototyping approach. A first prototype was presented to HEYCO's main actors that was based on the company's initial requirements. Then their feedback was integrated into the prototype to refine it step by step. In the end, the solution consisted of four main components:

The form processing module generates an e-mail with the interactive PO confirmation form as an attachment as soon as a purchaser creates a PO in the system.

The status management module tracks the status of each form.

The inbound processing module extracts the data from incoming forms, validates it, and updates the status management module's database tables.

The PO confirmation monitor reports on the content of the status management module's tables so the user can display all generated forms and their statuses.

Results Achieved

Only the manual transfer of the PO confirmation form to the SAP system is replaced by the automatic processing of the interactive form. Saving the PO in SAP ERP generates, in addition to the PO document, an interactive PO confirmation form that is sent to the supplier. With the implementation of interactive forms as a B2B solution to process purchase order confirmations, essential efficiency gains in time and quality were achieved.

Extent of use

Working with interactive forms is well accepted by the process owners in the purchase department, who were able to automate the recording of purchase order confirmations with more than 100 vendors within 6 months.

Lessons Learned

Interactive forms turned to be a highly flexible and powerful tool in avoiding media breaks in document-driven processes. The results of a feedback round with HEYCO's process owners were presented, which was carried out 9 months after the introduction of the new procedure. Based on the input from those interviews and a good way to support purchasers in their attempts to remove their vendors' concerns, useful enhancements for the application to meet changed requirements and to accelerate technology adoption were discussed.

Conclusion

The main process actors gave positive feedback, and they are confident that implementation of the planned improvements will result in even better and faster adoption of the technology. Interactive forms were evaluated as a suitable way to integrate all types of B2B partners into business processes. The feedback round also resulted in discussions about other processes that could be supported by interactive forms, such as requests for quotations, 8D reports, and suppliers' declarations. Other projects with interactive forms are planned.

Interactive forms for business processes (HEYCO)	
General information	• companies have been using information technologies (IT) like EDI and online portals to support the exchange of data with their business partners • interactive forms, unlike EDI, are electronic forms that can be generated from an enterprise application, enriched with application-specific data • HEYCO-WERK Heynen GmbH & Co. KG :supplier for the automotive industry

	with around 900 employees in EU
Intention	Improve the management of purchase order confirmations
Core element	Information and Technology
Situation faced	• the purchase department spent a lot of time entering incoming purchase order confirmations from its vendors into its SAP system • automation of the process was necessary with the most suitable technology, to make it more time- and cost-efficient.
Life cycle	Process redesign
Actions	• choosing a suitable technology to support the process with as many vendors as possible (3 types to consider: One-to-One,One-to-Many, Interactive Forms) • comparison of the technologies (6 indicators: Evaluation of ROI, Process Expertise and User Acceptance, Flexibility, Partner Acceptance, Possible Level of Automation, Possible Functional Scope) • Implementation of the Scenario with Interactive Forms
Results achieved	• essential efficiency gains in time and quality • interactive forms were well accepted by the process owners in the purchase department • automation the recording of purchase order confirmations with more than 100 vendors within 6 months
Lessons learned	• Interactive forms turned to be a highly flexible and powerful tool in avoiding media breaks in document-driven processes

26) Leading 20,000+ Employees with a Process-Oriented Management System: Insights into Process Management at Lufthansa Technik Group

Introduction

The Lufthansa Technik Group, provides aircraft maintenance, repair, and overhaul (MRO) services to about 800 customers around the world. Structured documentation of an aviation company's processes is a prerequisite to gaining an authority's approval for aircraft maintenance, repair, and overhaul. Processes had been documented in a continuously growing number of PDF-based text documents, but the growing complexity of processes meant that this approach to process documentation no longer provided easy-to-understand work instructions for employees that fulfilled the authorities' requirements.

Situation Faced

Performing aircraft MRO requires the approval of the respective customer's aviation authority. To gain approval, the company has to prove its processes' conformity with the respective law in terms of both process documentation and the practical execution of processes. Prior to the implementation of IQ MOVE, the company demonstrated its procedures' conformity with international laws and standards in a conventional way using more than 360 PDF documents issued by multiple departments and developed by about 250 employees across the company. These documents varied in length from 2 to 120 pages, contained a large number of cross-references, and described procedures from multiple points of view. As a consequence, the system had to be redesigned.

Lufthansa Technik Group implemented a process-oriented management system, the goal of which is to provide concise, easy-to-read documentation of processes in the form of process maps and swim-lane-based process descriptions. The system is designed to ensure seamless integration of normative and legislative requirements into the processes to avoid cross-references and to separate process documentation into multiple points of view. Moreover, IQ MOVE applies the "Framework for Assignment of Responsibilities" (FAR+) to strengthen process management roles and increase employees' acceptance of the system.

Action Taken

The core idea of the new system was to replace the existing documentation by means of a process-oriented, integrated management system that provides in one place all relevant information to performing an activity, taking all applicable norms, standards, and internal and external regulations into account. To implement this idea, a web-based application was developed in close cooperation with the future users of the system, particularly employees from production, such as aircraft mechanics and engineers.

This system was named IQ MOVE. “IQ” reflects the “integrated quality management” approach of combining several requirement disciplines in one system, while “MOVE” represents the flexibility and the ongoing development of the system and its content. The overall target of the IQ MOVE implementation is to ensure the “safety first” principle by providing to employees around the world all of the information that is relevant to the safe execution of processes and informed decision-making.

Requirement and Process Management Form the Basis of IQ MOVE

The IQ MOVE application consists of two major modules: A “Requirement Management” module and a “Process Management” module. The Requirement Management module is designed for the implementation of all requirements. Target groups for this area are authorities, certification bodies, and customers’ auditors. To build the content of the requirement database, internal Requirement Managers interpret all applicable requirements into actionable tasks and document these tasks in the requirement database.

The Process Management module contains the organization’s processes. All processes are modeled so they are easy for employees to understand. Processes are stored in IQ MOVE’s Process and Document Database.

To connect requirement management and process management, tasks that result from requirements are assigned to processes in the course of the Requirement Manager’s

“conformity check” and integrated into processes by process modeling teams before the processes are published.

Process Modeling in IQ MOVE

The integration of requirements into processes is enabled by the application of a concise process-modeling methodology that consists of multiple modeling levels with increasing levels of detail. The highest level of the “process world” consists of “process maps” that structure processes from a process-oriented organizational perspective. This structure is detailed by several levels of process maps until the next-highest level, a “process display,” is reached.

A process display consists of six swim lanes that contain the process’s roles and activities and provide an overview of the process flow and how the roles interact. Every activity in the process is further explained by “info boxes,” the third level, which present detailed information on how to perform the respective activity on responsible roles, applicable IT systems, and related documents. These “activity related documents” are the lowest level of the documentation and provide the highest level of detail in terms of checklists, forms, examples, and so on.

The IQ MOVE Editorial Process

The way of how Lufthansa Technik creates its process documentation is modeled in IQ MOVE. In the beginning the requirement database is updated by registering and revising all relevant requirements as the basis for the subsequent conformity check and the process documentation is created. Before they are published, all new processes and selected updated processes have to pass a conformity check to ensure compliance with all applicable norms and laws. The conformity check is split into an internal check and an external check.Most processes will be published right after successful completion of the conformity check, but some processes require an external conformity check by a supervisory authority.

The goal of this part of the editorial process is to ensure that all processes provide their information in English and any other languages made mandatory by the respective authorities. Mandatory languages are defined for each legal entity according to local requirements.

BPM Governance Based on the FAR+

An adapted version of the FAR+ was implemented in 2014 as the basis for the operation and improvement of processes to enforce process governance. The underlying idea of the FAR+ concept is the split of managerial responsibility into “process responsibility,” which defines how employees are supposed to perform processes, and “disciplinary responsibility,” which defines what employees are supposed to do. Both responsibilities must be defined for every position.

Roles are assigned to specialized employees and structured communication flows between the roles ensure the smooth operation of processes, provide a platform for decision-making, avoid unstructured escalation in case of a dispute, and align process strategy with business strategy.

The Procedure of Process Modeling in IQ MOVE

To ensure the applicability of process documentations, modeling of the processes in IQ MOVE is performed by three parties in joint process modeling sessions, based on the FAR+ concept.

IQ MOVE’s Operational Concept

To protect the investment in IQ MOVE and to improve the system, at the end of the project the project’s review board requested a concept for the system’s operations. As a result, the IQ MOVE’s Operational Concept was developed.

The concept is structured as a Plan-Do-Check-Act cycle. The core of the "Do" phase is related to the editing of content in IQ MOVE. Every 2 years, as part of the "Check" phase, all users of the system provide feedback, based on which, key result areas for improving the system are identified and measures for implementing these improvements are developed. Finally, in the "Act" phase, the developed measures are presented to the Process Domain Owner and the process participants' senior management for approval. Based on this committee's decision, measures are implemented in the "Plan" phase.

Results Achieved

Results of the biannual IQ MOVE user feedback indicate a constant level of acceptance by the employees, but ensuring the IQ MOVE vision of "finding all relevant procedures quickly and easily" is met in daily work remains a challenge. A periodically performed employee survey shows a high level of acceptance by the employees and increased awareness of the process-management roles (e.g., Process Owner, Process Architect, and Process Manager) based on the implementation of FAR+ and the integrated BPM Lifecycle approach.

Lessons Learned

Even after 10 years of BPM at Lufthansa Technik, the vision of "finding all relevant procedures quickly and easily" still drives all BPM activities. Along the journey to fulfilling this vision, key factors to increase the system's acceptance by the employees were identified. These key success factors of the system are the easy-to-understand process-modeling notation, the seamless integration of normative and legislative requirements into processes, the clearly defined process management roles, the holistic process-modeling team, and the comprehensive process operations concept that Lufthansa Technik Group applied.

Process-Oriented Management System (Lufthansa Technik)	
General information	• Lufthansa Technik Group: aircraft maintenance, repair, and overhaul (MRO) services to about 800 customers • 30 subsidiaries worldwide and more than 20,000 employees • compliance with international laws and standards is accomplished through the process-oriented

	management system called IQ MOVE
Intention	Make the increasing in complexity processes easy-to-understand for employees
Core element	People
Situation faced	• Structured documentation of an aviation company's processes was required for gaining an authority's approval for aircraft maintenance, repair, and overhaul. • the growing complexity of processes made the PDF-based text documentation hard-to-understand for employees that fulfilled the authorities' requirements.
Life cycle	Process implementation
Actions	• Implementation of a process-oriented management system called IQ MOVE. • Implementation of the "Framework for Assignment of Responsibilities" (FAR+)
Results achieved	• Daily use of the IQ MOVE by more than 20,000 employees at Lufthansa Technik. • high level of acceptance by the employees and increased awareness of the process-management roles
Lessons learned	• The integration of legislative and normative requirements into process descriptions helps to increase employees' acceptance of the system because it reduces the complexity of process documentation and increases the readability and usability of the process documentation in IQ MOVE • The clear definition of process-management roles increases employees' awareness of process management and facilitates the precise assignment of process-management activities to positions • The role concept also helps to improve process modeling by bringing the right parties together • The key to keeping the process management system on track is the IQ MOVE operational concept, which is the basis for the system's continuous improvement and that helps to structure and steer its global operation

27) “Simply Modeling”: BPM for Everybody-Recommendations from the Viral Adoption of BPM at 1&1

Introduction

1&1 is a German Internet service provider that embraced business process management (BPM) in 2010 as a way to optimize its processes. The company expected BPM to increase corporate performance and decided to use the Business Process Model and Notation (BPMN) for its business process models that led to a “success disaster” with a high adoption rate and a high number of models but low model quality.

This case shows that even large companies can implement BPM in a bottom-up and lightweight way that neither restricts modeling nor leads to inflexible structures.

Situation Faced

Origin of BPM at 1&1

1&1 acknowledged the merits of BPMN’s graphic representation in managing business processes when the enterprise delved into BPM as a way to optimize its processes in 2010. Gradually superseding a function-oriented management approach implemented by an enterprise resource planning system, BPM was initially intended to support the simultaneously launched Customer Satisfaction Offensive (CSO). In doing so, 1&1 sought to increase corporate performance by realizing such customer-centric goals as high quality standards, reduced set-up times, shortened time-to-market cycles, and increased adaptability to changing customer requirements. The CSO primarily dealt with process standardization and automation with the initial goal of making processes executable, but over time it became key to promoting BPMN as the graphic representation of business processes. Employees recognized the ease of using process diagrams as a means of communication in a process-oriented enterprise. BPMN became a popular means of communication, although using the notation was not always straightforward. A lack of clarity

concerning linguistic subtleties yielded to uncertainty, redundant design, and even low-quality process models.

Prerequisites and Early Decisions at 1&1

The system architecture, was visualised using a Process Editor, a Business Process Management System (BPMS) for executing processes, an Enterprise Information Portal (EIP) for gathering and analyzing information from across the enterprise, and a connection to the organizational user management using an Identity Management System (IMS). The EIP is a tailor-made portal for importing data from other systems and providing data via sophisticated information-retrieval options. The five-level process architecture, which provides an overview of the existing processes by classifying them into levels of abstraction, is depicted symbolically as a pyramid. The interplay between the system architecture and the process architecture helps to integrate an intuitive-to-use modeling environment in order to integrate BPM fully into the company.

However, in order for the architecture to function as intended, 1&1 had to meet five prerequisites:

- identify the value-adding processes and map them in an overall framework.
- develop a suitable system architecture to support the modeling and execution of processes.
- decide which management approach to apply for BPM.
- choose between a top-down or a bottom-up approach for BPM.
- start a small BPM initiative to provide governance.

The Success Disaster

As a result of its bottom-up approach, 1&1 observed a rapid spread and popularity of process modeling in the enterprise shortly after it was introduced. However, this development did not provide only benefits for the company. What at first seemed positive when thinking about 1&1's objectives emerged as problematic in 2013, when the enormous number of new users and new process models became a serious organizational and administrative challenge. The reasons for this initially mixed assessment of the approach's outcome were closely related to the quality of these models.

Action Taken

Identification of Issues and Associated Responses

The employees at 1&1 used almost every opportunity to share process models offering the potential and opportunity to transform 1&1 into a highly process-oriented enterprise. Consequently, the first activity in addressing the success disaster was to identify causes that contributed simultaneously to the initiative's success and failure. Naturally, the large number of both users and shared process models were a main reason for the models' erratic quality.

Despite the resulting low quality of many process models, 1&1 tried to strengthen this phenomenon with several adjustments, such as automated rule checks, that were intended to improve quality while not constraining users with too many guidelines. At first glance, insufficient training may have been seen as the only cause of poor-quality models, however a detailed investigation of possible reasons revealed that the causes for the situation were more complex.

The Technical Baseline: Process Architecture and System Architecture

The general process architecture outlined above worked well and was not affected by the changes made to increase model quality, so no action was taken. The system architecture is the process architecture's technological counterpart. The four core applications—the Signavio Process Editor, the BPM system, the EIP, and user management—have to be synchronized, which entails a full integration of and interchangeability between the tools. Therefore, a primary focus lies on the EIP, as it may be represented as the nerve center of the enterprise. All information that is relevant to the day-to-day business is gathered or linked here, so not only are access and links made to all shared process models from Signavio, but the EIP is fed through interfaces to almost all of 1&1's systems.

Improving Process Modeling Quality: Quality Assurance

Meaningful data is the backbone of today's enterprises, as there are strong relationships between data quality and system quality. To improve data quality sustainably, 1&1 had to put several measures into place, such as training and the nature and content of modeling conventions.

Concerning the organization of training, 1&1 increased both the number of trainers and the frequency of training. At the same time, the modeling conventions have been tightened. 1&1 takes a clear stand in giving as much freedom as possible and constraining or restricting only where it is deemed necessary and/or useful to do so, such as in providing conventions that prevent common pitfalls.

The BPM Initiative's Lean Governance

The main task of the BPM initiative at 1&1 is to guide the development of BPM and process modeling to ensure transparent and high-quality processes with a focus on practicability. It is fair to assume that the workload increased significantly after the activities related to the

quality-assurance measures were introduced. A growing number of qualified volunteer trainers and the approximately 50 BPM coordinators, act as multipliers in the enterprise.

Making Knowledge Visible

Knowledge management is increasingly critical in the management of an enterprise's corporate memory and intellectual assets. The purpose of knowledge management is to generate and provide meaningful information to the right people at the right time. The increased networking of systems provides a way to make employees' tacit process knowledge retrievable by other colleagues.

Results Achieved

In 2013, 3 years after the introduction of BPM, 1&1 was in the middle of its success disaster. After about 5 years of continuous adjustments and improvements, the enterprise sported a high-quality, mostly maintenance-free BPM approach that has created a highly dynamic and innovative process-oriented environment. A closer examination reveals two key aspects of the company's success in particular: An unusually strong viral spread of modeling ability and substantially improved architecture, governance, quality assurance, and knowledge management.

Benefits of Today's Situations

From a user-centric perspective, BPM can be found almost everywhere at 1&1 and it is on virtually everyone's lips. Process innovation can occur at any employee level in 1&1's large and proactive user community, where everyone can help everyone. As a result, the company is a strong, cooperative workplace and has a high level of expertise regarding process modeling.

Capabilities Necessary for Success

Every employee in 1&1 realizes that process modeling supports his or her daily work, so they not only use BPM but are also willing to help others directly or by delivering training courses. In addition, the lightweight restrictions imposed by the modeling conventions increase the quality of modeling.

Lessons Learned

The case of 1&1 provides useful insights that can be summarized in recommendations for the adoption of BPM as a paradigm. The list of recommendations is in no particular order of importance or urgency, but all can be related to the five areas of improvement.

(a) Create a working process-modeling environment.

(b) Create a working process-viewing environment.

(c) Do not be restricted by your contracts.

(d) Provide differentiated training.

(e) Do not prevent users from modeling.

(f) Regulate but do not over regulate modeling.

(g) Do not force it.

(h) Do not rush it.

1&1 provides a working example of where user content co-creation was successful despite initial setbacks and only moderate incentives. The recommendations given above can assist other enterprises to enjoy similar benefits when introducing or improving their BPM initiatives.

Viral Adoption of BPM at 1&1	
General information	• 1&1: German Internet service provider with specialization in Internet-access products and hosting and e-business solutions in the cloud • Operation in a highly competitive and dynamic market that is characterized by rapid price changes, increasing interchangeability of products, and/or short product lifecycles • 1&1 embraced business process management (BPM) in 2010
Intention	Optimization of 1&1's processes through the BMP implementation
Core element	People
Situation faced	• companies began to reflect on their business processes to maximize their performance • 1&1 sought to increase corporate performance by realizing such customer centric goals as high quality standards, reduced set-up times, shortened time-to market cycles, and increased adaptability to changing customer requirements • 1&1 started a small BPM initiative to provide governance, to keep the technical infrastructure operative, and to teach modeling by providing training • 1&1 observed a rapid spread and popularity of process modeling in the enterprise shortly after it was introduced, meaning that it wasn't beneficial only for the company
Life cycle	Process identification
Actions	• Identification of Issues and Associated Responses • Process Architecture and System Architecture • Improving Process Modeling Quality: Quality Assurance • The BPM Initiative's Lean Governance • Making Knowledge Visible
Results achieved	• BPM at 1&1 can enable continuous process adjustments triggered by any employee at any

	time and on every level, so it can achieve short time-to-market for core business products and services, as well as rapid changes in business processes. • Business knowledge and expertise is extracted from all of the company's corporate levels and is merged and presented in the process models.
Lessons learned	• Creating a working process-modeling environment is the first and most important use case. • Create a working process-viewing environment as it provides value to a BPM initiative. • Do not be restricted by your contracts. • Provide differentiated training. • Do not prevent users from modeling. • Regulate but do not overregulate modeling. • Do not force it. • Do not rush it.

28) Supporting Process Implementation with the Help of Tangible Process Models

Introduction

This paper deals with a medium-sized German auditing, tax, and management consultancy called Accounting & Tax (A&T) that executes audits and consultancy mainly within the health, social services, and public sectors. Companies invest considerable resources in the elaborate design of computer-based process models. Because of these models' inherent complexity, they are not necessarily suitable for communicating with and training the employees who are supposed to apply them, but their understanding the processes is essential for efficient and effective work.

Hence, creative, innovative methods are needed to bring these abstract models to life and increase their adoption by employees who typically have a low affinity for IT-related tools. Therefore, the methods that are developed should require little previous knowledge, (ideally) should not be IT-based, and should stimulate creativity, collaboration, and discussion.

They should also create a playful experience while still offering guidance and overview of existing processes.

Situation Faced

Because of the importance of its business processes, the enterprise represented them in IT-based process models created using the modeling language BPMN 2.0. These models serve the purpose of providing training and instruction and are the basis for analyses/improvements and external certifications. In addition, a process-oriented job control supported by a dedicated IT system is based on these models. The multifaceted areas of application assumes that the process models depict a comprehensive and complete picture of all the affected activities, resources, and coherencies. The respective sub-processes, as well as each single activity, have to be coordinated effectively, and the

required information must be provided completely and on time, so the process models are relatively complex.

The staff turnover in A&T is relatively high, which is common in the industry, but in increasingly competitive markets, professional service firms should work continuously to improve the efficiency of their job executions. Consequently, new employees must be trained often and quickly.

Action Taken

New staff members must capture and process a large amount of information quickly, to understand the company's business processes. While searching for new ways to improve the application of the process models, "imperfection" was the first requirement directed at the new training method. What seems paradoxical has proven to be useful: Obvious incompleteness and gaps in descriptions in process models promoted creativity in the beholders and motivated them to think about changes, additions, and variations.

The Department of Knowledge Management sought to create training methods for new staff members, that combine the logical, abstract process models with emotional, symbolic elements in order to facilitate the learning success. Since new employees in the enterprise typically have a low affinity for IT-related tools, the department also wanted to use methods that were not IT-based.

These requirements were converted into a framework.

The Process Card Game

The core team of the knowledge management project identified several suitable methods and elaborated on them during an intensive brainstorming session. One of these methods, the process card game, is based on traditional card games.

Based on this game, the single process steps of a process were portrayed on the cards. An image was assigned to each step, and each process step was given selected attributes and characteristic values.

The cards offer the advantage of making immediately visible the relevant process characteristics. In IT-based process models, the visualization of the process flows is often at the core, so even though a variety of process attributes can be attached to the models, this important information is often not immediately visible.

The Process Board Game

The process board game is a playful way to communicate extensive information about the processes, so it is a useful complement to the card game. Compared to the card game, though, the board game has fewer process steps, as the level of abstraction is higher so it does not take some details into account.

Results Achieved: Critical Reflection and Evaluation of the Methods

The goal was to determine the effectiveness of the method, which is deemed successful if it meets the requirements formulated and summarized in the initial framework. Based on this framework, an ideal method promotes creativity, supports communication, and combines abstract artifacts with symbols and vivid descriptions to reduce complexity. These attributes led to the specific requirements: a method that stimulates creativity among the participants, is neat and instructive, helps employees understand the process, creates a playful experience, promotes discussions and participation, and considers varying levels of expertise. Even so, it is unlikely that one method would meets all requirements completely.

Evaluation of the Process Card Game

After the training of new staff members had been running for several cycles, the participants, including the trainers, were invited to complete a survey that asked them to

reflect on the process card game. This survey was supplemented with a personal interview in order to uncover the reasons for the results.

The evaluations confirm the expectations for this method, as it improves the communication of processes and related information, so it improves the new employees' ability to apply the implemented process models.

Evaluation of the Process Board Game

In order to evaluate the quality of the board game method, the participants and trainers were invited to complete a survey that asked them about their opinions and perceptions of the board game. The survey was supplemented by a personal interview in order to determine the causes for the results. The evaluation results confirm the expectations.

Summary of the Results Achieved

The problem A&T encountered with implementing detailed business process models was that high complexity often interfered with comprehensibility. In order to turn complexity into something understandable, the company created new tools to support communication of the processes. The innovative, game based methods helped A&T handle the trade-off between the completeness and intelligibility.

The card game and the board game helped to change the prevailing attitudes of new employees toward the existing process models: The playful approach led the employees to want to deal with the IT-based models, as once they understood the procedures, they lost their timidity about asking for additional details. In the protected, playful classroom environment, the employees realized that it is not a sign of weakness to ask questions. Understanding the degree to which their work affects others also improved the attitude in the departments that participated in the training.

In short, the number of employees who retrieved the IT-based models on the firm's intranet increased, while requests for additional information on individual process steps declined.

Lessons Learned

Process models have to serve multiple areas of application. However, employees who are not familiar with process thinking might be overwhelmed by this complexity. The benefits of BPM implementations can be negatively affected if employees do not apply the available models to the desired extent.

One important finding of the case presented is that the newly introduced methods should be seen as enhancements of, rather than as substitutes for, the computer-based models. In other words, the computer-based models should be the basis for supplementation by the new methods.

It may not be necessary to represent all existing processes in the new, creative form. The advantage and the "core" of the new methods are their level of abstraction. New, creative methods work only so long as they fit the prevailing corporate culture. The level of creativity and playfulness should always be aligned with the company's values and "unwritten rules." The two new methods closed a gap between business analysts and specialty departments.

Tangible Process Models (A&T)	
General information	• many companies use computer-based models to document their procedures • A&T: medium-sized German auditing, tax, and management consultancy that executes audits and consultancy mainly within the health, social services, and public sectors • 250 employees at ten locations in Germany
Intention	new ways to communicate existing processes to employees
Core element	People
Situation faced	• Companies invest considerable resources in the elaborate design of computer-based process models • these models are rather complex and therefore not necessarily suitable for

	communicating with and training the employees • creative, innovative methods are needed to increase their adoption by employees who typically have a low affinity for IT-related tools
Life cycle	Process implementation
Actions	• development and implementation of two playful methods • card game: it conveys the most important process steps and process characteristics in a playful manner, achieving positive experience and memorization for the training participants • process board game: complements the card game by conveying deeper knowledge
Results achieved	• positive evaluation of the Process Card Game and the Process Board Game • Both methods provoked discussions and simulated creativity • Both methods are applicable to a variety of processes with reasonable effort
Lessons learned	• A clear business outcome and target group must be in mind when the new methods are first set up with additional methods being used as complements. • The focus should be on one process that matters most to the target group at the beginning and to concentrate on the basic process features while designing the creative methods. • The degree of creativity should fit the company and its corporate culture.

29) Business Process Modeling of a Quality System in a Petroleum Industry Company

Introduction

The case organization, which operates in the oil and gas sector, as an advanced technology company, has a long tradition of adopting new approaches to IT and organizational development.

The use of process and enterprise models in the company was divided into three purpose-based categories:

1. Construction of reality

2. Analysis and simulation.

3. Model deployment and activation.

These areas for the use of models are still central for enterprise process modeling. In 2001 this notation was evaluated and compared with other notations and the “home-brew” notation was kept, albeit with some changes. Some years later, when BPMN arose as a standard, the company adopted it, and in 2004 the company began using enterprise process models as part of its corporate management system. The company achieved a fair success with enterprise modeling in its corporate management system where workflow models are used extensively to communicate requirements and best practices throughout the enterprise.

Classifying the case according to the BPM Context Framework, the following can be found:

• Goal

– Focus.

• Process:

– Value contribution.

– Repetitiveness.

– Knowledge intensity.

– Creativity

– Interdependence.

– Variability.

• Organization

– Scope.

– Industry.

– Size

– Culture.

– Resources.

• Environment

– Medium competitive environment.

– Medium level of environmental uncertainty.

Situation Faced

Although the case organization works across a number of fields, the main activity is off-shore oil and gas production. This area focuses on safety and on compliance with the regulations in the country of operations. Offshore work, such as that in the North Sea, is also characterized by workers' working in shifts. When returning to the platform after 3 week off, workers must be able to work according to the procedures from the first minute to ensure safety and compliance.

The organization has a detailed management system, that defines how work is done in the company, and all employees are required to act according to its relevant governing documentation (GD). GD describes what is to be achieved and how to execute tasks, and it ensures standardization.

The management system's organizational function, Corporate Security and Safety—Corporate Management System (the CSS-CMS unit) is responsible for creating and improving the management system based on business needs, ensuring that the GD is understood and used, and monitoring compliance with work requirements. Around 50 persons work in this function, and an additional 15 or so persons from other parts of the organization, most notably from Corporate Audit (COA) work daily to ensure the quality and compliance of the quality system. The CSS-CMS function's work follows a five-step cycle:

1. Assess and plan changes to the GD.

2. Design the GD.

3. Implement the GD.

4. Use the GD.

5. Monitor and control use of the GD.

Until 2004, the company's quality system was text-based and was found in binders around in the organization. After an accident in which the procedures were not followed, it was determined that employees had not been able to identify all relevant procedures. At the same time, the organization merged with another organization that used process modeling more actively for structuring its quality system, and the merged organization was able to build on this example.

Action Taken

Over the last decade, the company's quality system has been restructured and maintained in the form of an integrated collection of process models. The general requirements for the quality system were described above, but five more concrete areas of use are also important:

1. Compliance management.

2. Competence management.

3. Portfolio management.

4. Analysis and decision-making.

5. Performance analysis.

The current primary purpose of the enterprise process model is compliance management. The process owners decide what is the right level of quality based on the use of and feedback related to the models. The underlying infrastructure to support the areas of

competency management and performance analysis was put also into production in the organization.

The model-based management system consists of three main parts:

• The end users assess the process models using a restricted subset of BPMN that is represented in the ARIS tool, the modeling solution that all of the GD in the models and in accompanying detailed documents uses.

• Docmap is used for handling and publishing textual GD.

• Disp is a tool that supports the process of handling applications for deviation permits when compliance with a requirement is difficult or impossible to achieve.

There are three levels of abstraction in the enterprise process model—the contextual level, the conceptual level, and the logical level—which include the interrelated diagrams.

The contextual level consists of a top-level diagram and navigation diagrams and provides a high-level overview of the enterprise. The top-level diagram, which is mandatory, contains a model of the enterprise in terms of both process areas and function areas. The management system's start page is a top-level diagram. The purpose of the navigation diagrams, which are optional, is to help the user navigate to the correct model by structuring and detailing the content in a process area.

The primary purpose of the conceptual level, which provides a conceptual view of the enterprise as model diagrams and process navigation diagrams, is to show relationships between or within models.

The model diagram is a mandatory diagram that shows the content of a closed content group or a process area. It may contain collapsed workflow models, process models, and document models.

The optional process-navigation diagram, which is used to show how workflow models are related to each other, uses collapsed workflow models, start events, end events, and intermediate events.

The logical level shows the breakdown of the enterprise model into generic elements. The only diagram that visualizes the logical level of the enterprise model is the workflow diagram, a mandatory diagram that is modeled using an adapted subset of BPMN 2.01.

There are several ways for users to access GD:

• Navigating through process areas.

• Using the navigation history.

• Using “breadcrumbs”.

• Searching.

• Using “MyPage”.

Results Achieved

The process modeling approach provided the employees the ability to structuring the quality system in manageable pieces that, together with good tool support for accessing the models and detailed requirements for the process, made it much easier to find relevant parts of the process, thus doing a better job of supporting the work to be done. Although used in various ways and at various levels, the models were visited and searched for extensively and by almost all employees. Improved compliance with regulations and reduction in the number of accidents were observed. This improvement is not attributable only to the restructuring and presentation of the quality system through process models, but the process models are a visible sign of the organization’s focus on safety and compliance, and it has made it easier

for workers to find relevant regulations and requirements when dangerous work is to be undertaken.

Lessons Learned

Although the models in the quality system are widely used and likely contribute to the improved safety and compliance of company operations, there is also room for improvements in the approach. A large-scale user survey was conducted in the company to clarify users' experiences and opinions related to the management system and GD. The results of the survey revealed many challenges related to the management system itself, as well as educational processes and work practice, all of which contribute in some way to the management system's goals of safety, reliability, and efficiency. Ensuring that all employees can find all the models they need and that the models are kept up to date based on practice are important challenges. In addition, handling the trade-offs among goals for safety, efficiency, and compliance is a challenge. Modeling practices that were regarded favorably at an earlier stage might come to be seen as insufficient for the future needs. Therefore, professional long-term use of models must be conscientiously pursued over time.

Quality System in a Petroleum Industry Company	
General information	• The organization operates in the oil and gas sector, has more than 24,000 employees and approximately the same number of external contractors • Permanent employees are divided among organizational units of varying size • Use of process modeling for the structure its massive amount of organizational knowledge during the last decade
Intention	exploitation of the BPM framework to support compliance and improvement.
Core element	People
Situation faced	• Until 2004, the company's quality system was text-based and was found in binders around in the organization • After an accident in which the procedures were not followed, it was determined that employees had not been able to identify all relevant procedures. • the organization also merged with another organization that used process modeling more actively for structuring its quality system, and the merged organization was able to build on this example

Life cycle	Process implementation
Actions	• development of a new way of structuring and accessing the material based on the existing quality system, with navigational support through an intranet solution whose use was mandatory in the workplace
Model-based management system	• The end users assess the process models using a restricted subset of BPMN. The models represent how people are expected to work at the company and also support checking adherence to the models at various times • Docmap is used for handling and publishing textual GD • Disp is a tool that supports the process of handling applications for deviation permits when compliance with a requirement is difficult or impossible to achieve
Results achieved	• Improved compliance with regulations • reduction in the number of accidents • easier for workers to find relevant regulations and requirements when dangerous work is to be undertaken
Lessons learned	• there is room for improvement in this large-scale example of the use of process models to structure a company's quality system • handling the trade-offs among goals for safety, efficiency, and compliance is a challenge • professional long-term use of models must be conscientiously pursued over time

30) Business Process Management in German Institutions of Higher Education: The Case of Jade University of Applied Science

Introduction

Faced with challenges like heterogeneous processes across three campuses, a campus management system that was not up to date, and loss of knowledge because of demographic changes and undocumented, inconsistent processes, Jade University of Applied Science implemented a campus-management system developed by HIS. This system includes an integrated reference model for processes that are related to campus management. The university wanted to use common standards and needed a guide based on best practices. Implementing business process management (BPM) provides an opportunity to document, standardize, and centralize processes across their campus locations.

Situation Faced

Based on challenges like an obsolete campus management system, heterogeneous processes across three campus locations, loss of knowledge because of demographic changes, and the need for digitalized and documented processes, Jade University decided to implement HISinOne and the integrated software reference model. Jade wanted to use common standards and needed a guide based on best practices and saw the implementation of the system and a BPM as an opportunity to document and standardize its processes.

Goal-Dimension

Jade University sought to improve aspects of its processes, such as (a) managing and protecting internal knowledge, (b) standardizing processes across all campus locations, and (c) orienting to the best practices relating to campus management (system) processes.

Furthermore, Jade's employees expected (d) full documented guidance on how they should do their work.

Overall, Jade intended to implement processes and preconfigured settings in the standard software using the HISinOne recommendations to reduce the project delays that often accompany the development of new tasks.

Process Dimension

In general, universities like Jade University that have multiple campus locations have heterogeneous types of processes that are not distinctly assignable to a specific characteristic value. For example, the knowledge intensity of the processes considered varies widely. Most of the processes are complex, requiring training for up to 2 years because understanding and executing these processes requires knowledge. There are also some simple processes that are not difficult to understand and execute.

The level of processes' creativity ranges widely. Many of the processes in the campus management system are highly interdependent, with processes and flows linked to previous or subsequent processes, but starting and ending points are defined precisely and connectable via integrated interfaces.

Organization Dimension

Jade University, established in 2009, has three campus locations, one each in Wilhelmshaven, Oldenburg, and Elsfeth (Germany). The scope of this BPM project embraces the processes that are related to campus management in each of the campus locations, as well as those that occur in all three locations. Implementing HISinOne is the biggest project related to the field of BPM undertaken by this institution. Therefore, a project team was created and a professional project management was established.

Jade University is a small to medium-sized institution of higher education. The industry/sector can be defined as service because Jade offers educational services. Because of the importance of this implementation, Jade hired two employees to manage the project

and two additional employees to execute the daily work. However, very limited resources were available, especially considering the complexity and the objective of the project.

At the beginning of the project, the limited expertise in BPM that was available was a risk factor. Most employees were open-minded and supportive of BPM, but there were some skeptics who were only moderately supportive. In general, the culture was characterized by employees who were highly and medium supportive of BPM. One issue was to create acceptance, a BPM-supportive culture, and expertise.

Environment Dimension

BPM is becoming important for Jade University because of the rising competitiveness that makes it essential that the university be up to date and interesting to applicants and researchers. The level of uncertainty in this sector is low.

Action Taken

Implementation of the campus management system and reference processes was structured in steps that can be described using a BPM lifecycle model:

Initialization

A project team and project management were established to support implementing the campus management system and the BPM.

Process Identification

Jade determined the processes that would be used based on the best practices of the education sector so it put a strong focus on the reference model's suggested flows.

Process Discovery

Derived from the determined objectives the project team had to define maximally efficient actions because resources were limited.

Process Analysis

The process analysis step is workshop-oriented. In these workshops, the Jade University's process manager discussed the reference processes with the relevant stakeholders, taking three primary questions into account:

Do the processes map to our current operational sequences? What needs to be improved? What should be changed?

Process Redesign

The process modeler, relevant stakeholders, and HIS specialists determined in collaborative workshops how the processes should be executed.

Process Implementation

The implementation was realized with configurations of the HISinOne system based on individual specifics of Jade University.

Process Monitoring

There was no explicit mechanism with which to measure, monitor, or control the project's performance, but the achievement of goals was rated using other methods.

Each of these steps is directly related to using the HISinOne reference model to obtain recommendations based on best practices.

Results Achieved

Because there was no explicit mechanism with which to measure, monitor, or control the university's and its processes' performance, the focus went on the qualitative statements of the experts involved.

Ensuring Knowledge Management

The first goal, ensuring knowledge management, can be rated as having been achieved.

Standardizing Processes

The second issue was related to the standardization of processes across Jade's three campuses. This objective was definitely achieved, considerably improving the university's initial situation.

Adopting Best Practices for Higher Education

An essential result was achieved by the creation of an adapted process model for Jade's essential campus management processes. Furthermore, concepts for all software modules were created, and the process areas for application management and student administration were analyzed, redesigned, and implemented. Instead of changing many recommended actions, Jade changed only some organizational dimensions, such as mapping and relocating employees and operations.

Developing a BPM-Supportive Culture

The acceptance of BPM was achieved, which has a strong impact on the success of a BPM project.

Improving Team Spirit

Team spirit improved over time. Internal workshops and discussions to standardize processes across the campus locations strengthened the entire university staff's team spirit. Despite the separate locations, the departments involved started to grow together and to be more unified; that is, they began to be "one university," rather than three locations of a university.

Lessons Learned

Five primary lessons were learned during the project:

Orient to Existing Solutions vs. Starting from Scratch

Orienting to existing solutions like process reference models supports the initialization of new projects.

Maintain Awareness About Tradeoffs in Standardizing vs. Allowing Total Creativity Regarding Process Management

Standardization limits the involved stakeholders' creativity.

Develop Guidelines for Consistently Documenting vs. Omitting this Step to Speed the Project

Guidelines for consistently documenting the implementation's progress are important to easily provide relevant information to all stakeholders at all times.

Develop Concepts for Bringing People Together vs. Implementing BPM Without All Stakeholders

Integrating relevant stakeholders into the process enables the standards across different locations to be determined

Consider Limited Resources vs. Unplanned Conducting of Activities Comparability of this Case

Limited project resources must be taken into account in order to plan suitable and feasible actions.

Comparability of this Case

The use of the BPM lifecycle and the limitation to the BPM in the context of smaller institutes of higher education can be seen in the Jade case, making it comparable to other BPM projects in the field of higher education.

German Institutions of Higher Education (Jade University of Applied Science)	
General information	• Information systems (IS), such as campus management systems, can illustrate students' entire educational lifecycle, from application to ex-matriculation • Jade University, established in 2009, is a medium-sized institution of higher education with 500 employees and three campus locations
Intention	improve aspects of the University's processes, such as (a) managing and protecting internal knowledge, (b) standardizing processes across all campus locations, and (c) orienting to the best practices relating to campus management processes.
Core element	Culture
Situation faced	• heterogeneous processes across three campuses

	• a campus management system that was not up to date • loss of knowledge because of demographic changes and undocumented, inconsistent processes • need for common standards use and for a guide based on best practices
Life cycle	Process identification
Actions	Implementation of the campus management system and reference processes was structured in steps that can be described using a BPM lifecycle model. Each of these steps is directly related to using the HISinOne reference model to obtain recommendations based on best practices.
HISinOne reference model	1. Process Map 2. Use Cases of a Business Process 3. Technical Flow of Use Cases in a Business Process 4. Workflow 5. System Use Cases
Results achieved	• ensuring knowledge management, can be rated as having been achieved • standardization of processes across Jade's three campuses • adoption of best practices for higher education • development of a BPM-supportive culture • team spirit improvement
Lessons learned	• orienting to existing solutions like process reference models supports the initialization of new projects • standardization limits the involved stakeholders' creativity • guidelines for consistently documenting the implementation's progress are important to easily provide relevant information to all stakeholders at all times • integrating relevant stakeholders into the process enables the standards across different locations to be determined • limited project resources must be taken into account in order to plan suitable and feasible actions

31) Exploring the Influence of Organizational Culture on BPM Success: The Experience of the Pernambuco Court of Accounts

Introduction

An increasing interest in BPM by the public sector has been observed. Three main factors motivate public organizations to embrace a process-centric perspective: the first motivation involves citizens' demands for improved quality of public services, the second involves the need to adopt information technologies to support e-gov solutions, and the third involves the continuous pressure for accountability and transparency of their activities that public organizations face.

This chapter investigates the BPM experience of the Pernambuco Court of Accounts (TCE-PE). How the organization's culture influences the BPM initiative's evolution both positively and negatively.

Situation Faced

An early driver of the BPM initiative at TCE-PE was its solid strategic planning and project-driven culture. The organization's strategy monitoring includes follow-up bimonthly meetings with departments and annual summits with the board of directors and managers.

In 2001, the organization made preliminary attempts to build a strategic map. The departments created plans, but most of them were not related to strategic goals. Moreover, there were neither indicators nor operational processes to monitor these plans systematically. At the end of 2003, the first strategic plan was built for the period 2004–2008, after which the plan became an institutionalized management practice.

The current strategic plan is based on SWOT analysis and Balanced Scorecard (BSC), comprising the period 2013–2018. The goals of the current strategic plan include increasing the effectiveness of external control, improving public management, strengthening the institution's image in society, obtaining agility in judgment processes without compromising

quality, encouraging innovation and knowledge management, and consolidating public sector governance.

TCE-PE introduced BPM practices in 2012 and instituted a Business Process Management Office (BPMO) a year later. At that time, the leaders of the initiative realized that they didn't have sufficient expertise in process improvement, so the board of directors established an R&D partnership with researchers from UFPE, a local university.

Strong sponsorship of the project from the president and influential directors was the most influential facilitator in promoting the BPM initiative. They were committed to and always supportive of the implementation of new process-centric ideas. During the systemic analysis, a major barrier that was identified was employees' resistance to change. Strong sponsorship was a key asset but that the people and cultural factors had to be addressed in order to ensure a sustainable organization-wide BPM initiative.

This diagnosis was a fundamental tool in understanding the current situation, identifying the main goals of adopting BPM, and planning its evolution. An important outcome was the conclusion that, in order to disseminate BPM successfully, the members of the BPMO team had to investigate the organizational culture sufficiently to improve the alignment between BPM principles and internal cultural values and practices.

Actions Taken

In-depth interviews, observations, and documentation analyses were conducted in order to understand each interviewee's organizational culture. Then the extent to which the TCE-PE culture is aligned with a BPM-supportive culture was analyzed, as represented by the CERT values.

The CERT values that are supportive of a BPM culture, are:

• Customer Orientation (C)—Focuses on customer needs and expectations regarding the process's outputs.

• Excellence (E)—Refers to the direction toward continuous improvement and innovation as a way to improve business processes' performance.

• Responsibility (R)—Involves attitudes and committed actions to achieve process objectives, as well as accountability and transparency regarding process decisions.

• Teamwork (T)—Refers to an open mindset to cross-functional collaboration.

The framework which presents the interrelationship between BPM and organizational culture in terms of its influence on the organization's performance was also used. The authors claimed that, in order to implement BPM successfully, the organization's culture must be influenced or changed for the better. To achieve that goal, the BPM team must understand the organization's visible artifacts, values, and basic assumptions.

Weak Communication

Both internal communication and external communication is weak. The public has no clear understanding of the role and the activities undertaken by a Court of Accounts, and staff often fails to comprehend who the internal clients are and, consequently, with whom they must interact.

Resistance to Change

Resistance to change was observed, especially from older staff, who expressed a feeling of distrust regarding any new managerial approach. They frequently mentioned that they had seen many innovative approaches that failed. This resistance stems primarily from the fact that changes may take them away from their comfort zones.

Strong Sponsorship

Despite being an embedded value of organizational culture, resistance to change can be minimized by political power. Top management sponsors must support strategic changes. Strong sponsorship has been a key factor in the success of the BPM initiative at TCE-PE.

Low Levels of Integration between Teams

The low level of integration between teams is part of the organizational culture at TCE-PE, and it represents a critical issue. The fact that employees often do not feel like parts of a single integrated team and do not understand the relevance of their work to achieving strategic goals negatively influences the CERT values of teamwork and responsibility.

Mixed Views on Innovation

Formality and conservatism are strong cultural values at TCE-PE in large part because of the organization's central role as auditor of public accounts. These values may be barriers to innovation and change, but there is an increasing awareness of the need to promote innovation at the institutional level. The staff has mixed views toward innovation. A positive aspect of the culture is that, at the strategic level, the staff is open to innovation.

Conservative Mindset

Aspects of the existing organizational culture, such as bureaucracy, legalism, and resistance to change, are barriers to implementing a modern management model.

Personal Satisfaction

The staff is personally satisfied with working at TCE-PE because of the organization's mission to inspect the correct use of public funds, which is considered a noble job. The cultural value

of personal satisfaction positively influences the CERT values of excellence, responsibility, and teamwork.

Boredom

Some employees show a level of boredom as they are tired of the bureaucratic work and often do not see the results of their efforts.

Meritocracy

Aware of the problem of employees' boredom, TCE-PE established a financial reward system that evaluates employees' individual performance based on their individual achievement of goals defined by their managers. The organization is also trying to reduce political appointments to key positions.

Ethics and Transparency

Ethics and transparency are public values described in the TCE-PE strategic plan.

Results Achieved

A set of cultural values, practices, and organizational characteristics at TCE-PE were identified, that may influence the BPM culture—that is, the aspects of the organizational culture that would act as facilitators of or barriers to a BPM initiative. A set of strategies were presented that nurture the cultural values that are supportive of BPM and hinder those that are obstacles of BPM.

The consolidation of the strategic plan with well-defined goals to guide improvement actions, and strong project-driven practices are drivers of the BPM cultural transformation at TCE-PE.

By clarifying the stakeholders' expectations and levels of power, the negative outcomes of the cultural values of weak communication, boredom, conservative mindset, and resistance to change can be mitigated.

In regard to communication, TCE-PE has already included the goal of improving internal and external communication in the strategic map. Effective communication strategies can reduce resistance to change, improve integration between teams, and demystify innovation. The definition of clear individual, departmental, and organizational goals and the transparency of results are intended to encourage staff engagement and motivation, leverage meritocracy and minimize staff boredom.

Lessons Learned

Four primary lessons were learned toward establishing a BPM-supportive culture at TCE-PE:

• Associate the BPM maturity model with the organizational strategic map.

• Invest in communication strategies.

• Determine who the stakeholders are and what they want.

• Create a long-term vision of BPM goals and communicate them to future sponsors.

The experience presented in this chapter has value for public organizations that face challenges in aligning their organizational culture with BPM principles.

Organizational Culture on BPM Success (TCE-PE)	
General information	TCE-PE: public organization with around 900 employees who are responsible for auditing state and municipalities accounts
Intention	be recognized as an effective instrument for improving public management in defense of social interests and prevention of corruption
Core element	Culture
Situation faced	preliminary attempts to build a strategic map with the plans created not being related to strategic goals lack of indicators or operational processes to monitor these plans systematically introduction of BPM practices in 2010, yet insufficient expertise in process improvement from the leaders of the initiative
Life cycle	Process identification
Actions	Conduction of 9 in-depth interviews with staff from a variety of areas and in a variety of hierarchical positions, so as to understand the TCE-PE culture: • Weak Communication • Resistance to Change • Strong Sponsorship • Low Levels of Integration between Teams • Mixed Views on Innovation • Conservative Mindset • Personal Satisfaction • Boredom • Meritocracy • Ethics and Transparency
Results achieved	Identification of a set of cultural values, practices, and organizational characteristics at TCE-PE that may influence the BPM culture Presentation of a set of strategies that nurture the cultural values that are supportive of BPM and hinder those that are obstacles of BPM
Lessons learned	Key success factors are the following: • investing heavily in communication • understanding who the stakeholders are and what they want • creating a long-term vision of BPM goals and articulating them with future sponsors the experience has value for public organizations that face challenges in aligning their organizational culture with BPM principles

REMARKS

In this section, the objective of our work was to analyze 31 case studies and create tables, using the book “Business Process Management Cases” to analyze each case study. In particular, the analysis and the segmentation into 9 categories (General information, Intention, Core element, Situation faced, Life cycle, Actions, Model, Results achieved and Lessons learned) helped us understand how the introduction of a well organized Business Project Management can help an organization or a firm to cope with its problems and become competitive. The findings of this section will be analyzed in detail in the next section.

4.Key Findings Analysis

INTRODUCTION

In all 31 cases there was a problem with the way a business or one or more organizations operate. In any case, the problem was identified and appropriate measures were taken to address it. The methods used relate to tracks from the Business Project Management (BPM) cycle or variants thereof. BPM is the project management of internal business projects that are undertaken to further a company's strategy or objectives. In all cases, the original was improved and resolved in most cases. Each unit has come to conclusions that have helped her and will continue to help her organize and better understand the BPM cycle. More precisely, the BPM helped the organizations tremendously, some of the benefits that BPM offered are the following: (1) have a more predictable project planning and execution process, (2) adhere to project budgets, schedules, and scope guidelines, (3) resolve project roadblocks and escalate issues quicker and easier, (4) identify and terminate projects that do not have relevant business value, (5) become more efficient, (6) improve collaboration across and within teams, (6) identify and plan for risks.

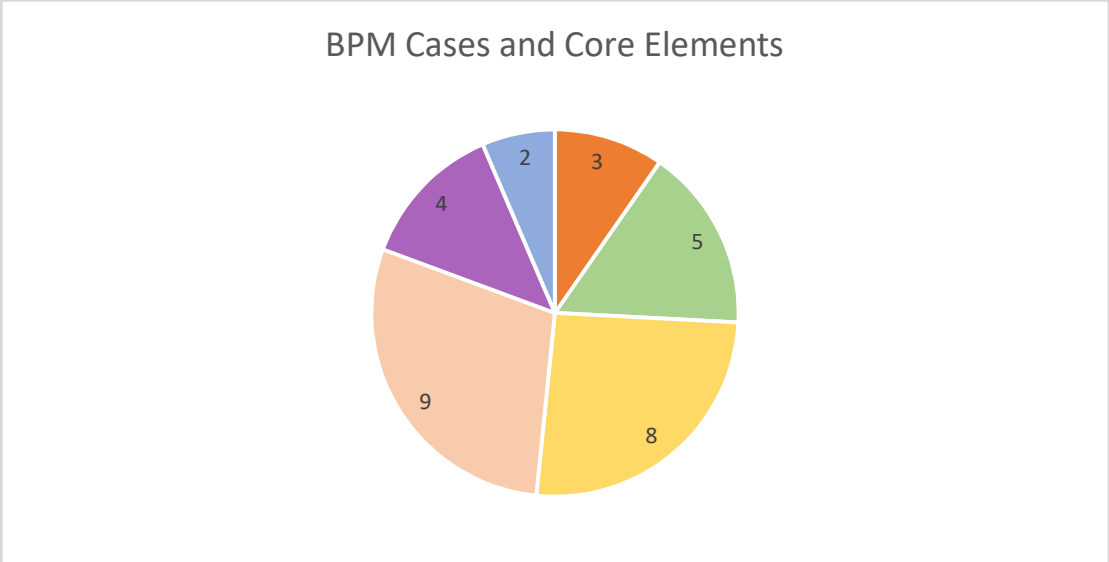
The BPM Six Core Elements Model describes organizational capability areas that are relevant to BPM. The model helps decision makers to classify the actions an organization undertakes in conducting BPM by conceptualizing six BPM capability areas: strategic alignment, governance, methods, IT, people, and culture. Those areas are the six categories that we will study in the following section. The strategic alignment involves: (1) Process improving planning, (2) Strategy & Process Capability Linkage, (3) Enterprise process Architecture, (4) Process measures and (5) Process customers & Stakeholders. The Governance includes: (1) Process management Decision making, (2) Process Roles & Responsibilities, (3) Process Metrics & Performance Linkage, (4) Process Related Standards and (5) Process Management Compliance. The methods incorporate: (1) Process Design and Modeling, (2) Process Implementation & Execution, (3) Process Monitoring & Control, (4) Process Improvement & Innovation and (5) Process Program & Project Management. The IT includes: (1) Process Design and Modeling, (2) Process Implementation & Execution, (3) Process Monitoring & Control, (4) Process Improvement & Innovation and (5) Process Program & Project Management. The people category includes: (1) Process Skills & Expertise, (2) Process Management Knowledge, (3) Process Education, (4)Process Collaboration and (5) Process

Management Leaders. The final category Culture comprehends: (1) Responsiveness to Process change, (2) Process Values & Beliefs, (3) Process Attitudes & Behaviors, (4) Leadership Attention to Process and (5) Process Management Social Network.

Strategic Alignment	Governance	Methods	IT	People	Culture
Process improving planning	Process management Decision making	Process Design and Modeling	Process Design and Modeling	Process Skills & Expertise	Responsiveness to Process change
Strategy & Process Capability Linkage	Process Roles & Responsibilities	Process Implementation & Execution	Process Implementation & Execution	Process Management Knowledge	Process Values & Beliefs
Enterprise process Architecture	Process Metrics & Performance Linkage	Process Monitoring & Control	Process Monitoring & Control	Process Education	Process Attitudes & Behaviors
Process measures	Process Related Standards	Process Improvement & Innovation	Process Improvement & Innovation	Process Collaboration	Leadership Attention to Process
Process customers & Stakeholders	Process Management Compliance	Process Program & Project Management	Process Program & Project Management	Process Management Leaders	Process Management Social Network

Source: Six BPM core elements (Rosemann and vomBrocke 2015)

The next plot demonstrates the allocation of the core elements (Strategic Alignment, Governance, Methods, IT, People and Culture). In particular, it shows that 8 of the 31 cases relate primarily to method and 9 to IT, confirming that most companies focus on these two areas of capability when conducting BPM (vomBrocke and Rosemann 2015). However, four cases relate to the people-related aspects of BPM, one of BPM's core elements that often receives little attention (Müller et al. 2014). Five chapters contribute primarily to governance and three to strategic alignment. Since culture has only recently been recognized and conceptualized in the BPM body of knowledge (Schmiedel et al.2015), only two of the cases primarily address issues on culture in BPM. In summary, each core element is addressed in multiple cases, which makes this dissertation useful in extending our understanding of BPM.



Source: Jan vomBrocke& Jan Mendling, Management for professionals (2018)

1.Strategic Alignment

BPM contributes to the organization's superordinate, strategic goals. Related capabilities include the assessment of processes and process management initiatives according to their fit with the overall corporate strategy. Strategic alignment is the process and the result of linking an organization's structure and resources with its strategy and business environment (regulatory, physical, etc.) Strategic alignment enables higher performance by optimizing the contributions of people, processes, and inputs to the realization of measurable objectives and, thus, minimizing waste and misdirection of effort and resources to unintended or unspecified purposes. In the modern, global business environment, strategic alignment should be viewed broadly as encompassing not only the human and other resources within any particular organization but also across organizations with complementary objectives (i.e., performance/business partners).

Regarding the strategic alignment of the firm the main problems faced in the two case studies were the following: (1) the difficulties with communication and collaboration among employees, (2) the need for fundamental change regarding the strategy of the firm, (3) the need for redesign of the process. The firms implemented the BPM model, something that

offered them substantial lessons and results. The most important results achieved was transformation of the organization into a stable, change-ready and flexible body that was ready to realize growth, adopt structural changes and withstand external market shocks and the Changing the staff's mindset to being patient-centric and helping them to realize who their real customer is have resulted in doctors' having more time to make better diagnoses through the use of the IT-based health information system and ready assistance from the support staff. Finally, the most important lessons learned were the following:(1) valuable insights into how business transformation can be managed in practice, (2) critical thinking about major pitfalls and success factors and how a business process perspective can add value in a holistic approach to business transformation, (3) every aspect of the organization must be incorporated into the transformation approach, (4) raise of questions related to whether the transformation approach is holistic, some aspects of transformation are missing and what the company should have done differently and why, (5) how all of the enabling elements (championship, community, and executive support), lined up, each making its own significant contribution.

2.Governance

BPM must be implemented in the organizational structure. Related capabilities include the assignment of BPM-related tasks to stakeholders and applying specific principles and rules to define the required responsibilities and controls along the entire business-process lifecycle. Corporate governance is the system of rules, practices, and processes by which a firm is directed and controlled. Corporate governance essentially involves balancing the interests of a company's many stakeholders, such as shareholders, senior management executives, customers, suppliers, financiers, the government, and the community. Since corporate governance also provides the framework for attaining a company's objectives, it encompasses practically every sphere of management, from action plans and internal controls to performance measurement and corporate disclosure.

Regarding the governance of the firm, the main intention of the BPM model were the following: (1) help organizations of all sizes and in all industries overcome the complexities that plague our businesses, our jobs and our lives, (2) monitor and manage business processes using process-oriented key performance indicators, (3) Increase the competitive

advantage, customer satisfaction, and operational efficiency of the telecommunications industry, (4) transformation of the organization into a process-oriented organization, (5)help organizations of all sizes and in all industries overcome the complexities that plague our businesses, our jobs and our lives simplification of processes. The BPM model resulted in the simplification of the internal process, raise of the productivity of the firm, improvement of the incident management process, and Establishment of a central BPM department in most firms. Last but not least, the main results learned were the following: (1) Process content is an important success factor in a BPM implementation, (2) process ownership requires consideration of the various BPM elements, (3) early involvement of stakeholders from top management to the operational level is essential for successful implementation, (4) customization of reference models requires a transparent approach to decision making, (5)general BPM governance and methods are important for an operational process improvement, (6) need for replacement outdated and inadequate IT solutions and systems, (7) need for establishment of technical and quality control over business operations in order to enhance customer satisfaction through faster and cheaper provision of services and (8) a hybrid of declarative and imperative modeling is best suited for highly dynamic business domains instead of a rigid process modeling.

3.Methods

BPM must be supported by methods for process design, analysis, implementation, execution, and monitoring. Related capabilities include selecting the appropriate BPM methods, tools, and techniques and adapting and combining them according to the organization's requirements.

As for the methods, the core intentions of the BPM model was to establish a rapid process, since traditional BPM approaches are often time-consuming, exclusively focused on pain points and not tailored to immediate process transformation, make the material purchase process efficient and consistent, excluding the intermediate information system, improvement of the process design, implementation and monitoring phases of the process management lifecycle and to identify sets of previously unrecognized context variables that affect claim outcomes in terms of duration and cost. The firms implemented the BPM model, something that offered them substantial results and lessons for the future. The most

important results in methods involved the following: (1) formalization of the employees' perceptions regarding the existing purchasing process, (2) design of a to-be process for material purchasing, which was approved by all stakeholders, (3) formalization of requirements for the new information system for managing the material purchasing process, (4) increase of firms' productivity, (5)process models were developed to facilitate comparative visualization of processes, (6) identification of several process-related software issues and (7) significant reduction of needed resources. Finally, the most significant lessons learned were the following: (1) importance of collaborative nature, (2) importance of flexible project management, (3) significance of existing a reliable measurement of the progress, (4) importance of worker's empowerment, (5) importance of good systems in project management and (6) there was no existing automated, intuitive way to perform process-performance comparison, particularly where multiple process models were involved.

4.Information Technology

BPM must use technology, particularly process aware information systems (PAIS), as the basis for process design and implementation. Related capabilities include the ability to select, implement, and use relevant PAIS solutions that covering, for example, workflow management, adaptive case management, or process-mining solutions.

Regarding the situation faced, the main issues faced were the following: (1) Inadequate number of publicly available charging points with many isolated small providers, (2) Increased demand for highly flexible laboratory processes due to internationalization of laboratories and digitalization of paper-based work practices, (3) lack of process documentation, (4)outdated information system support, (5) outdated quality assurance, (6) need for improvement of process efficiency and effectiveness and automation of the process was necessary with the most suitable technology, to make it more time- and cost-efficient. The enactment of the BPM model helped the company to analyze the most recent version of the report process, to spend fewer resources, to achieve better inventory accuracy, to increase process efficiency and point out the characteristics and points for improvement in individual human activity. Concerning the IT of the company, the main lessons learned, are the following: (1) nowadays businesses are process-driven, (2) most systems have design-time data that defines the processes and runtime data that includes

information on executed activities, (3) connectors can be used to extract the data in the desired process log structure, (4) processes can be analyzed from several perspectives, (5) all employees have to be trained that process models are a means of communication and are never finalized, a notion that also applies to continuous process improvement and (6) process owners must be defined so they take responsibility for adjustments to the process environment beyond the project's lifecycle, but such responsibility is not solely that of a project manager.

5.People

BPM must consider employees' qualifications in the discipline of BPM and their expertise with relevant business processes. Related capabilities include assessing the human-resources impact of BPM-related initiatives and programs that facilitate the development of process-related skills throughout the organization.

The two case studies that used people as core element gave us significant understanding about the importance of the BPM model. The intention of the model was to exploit of the BPM framework to support compliance and improvement of the human resources. In addition, another intention of the model was to improve the organizations processes by managing and protecting internal knowledge, standardizing processes across all campus locations and orienting to the best practices relating to campus management processes. The implementation of the model contributed significantly by offering important short and long run results and providing important results for the future. The more substantial results were that BPM model can enable continuous process adjustments triggered by any employee at any time and on every level, so it can achieve short time-to-market for core business products and services, as well as rapid changes in business processes and Business knowledge and expertise is extracted from all of the company's corporate levels and is merged and presented in the process models. Last but not least, the most important lessons were the following: (1) creating a working process-modeling environment is the first and most important use case, (2) create a working process-viewing environment as it provides value to a BPM initiative, (3) a clear business outcome and target group must be in mind when the new methods are first set up with additional methods being used as complements, (4) the focus should be on one process that matters most to the target group at the

beginning and to concentrate on the basic process features while designing the creative methods, and (5) the degree of creativity should fit the company and its corporate culture.

6.Culture

BPM must be met with a common value system that supports process improvement and innovation. Related capabilities include the ability to assess the organizational culture's values and the ability to derive measures to develop these values accordingly.

Regarding the culture of the company, the main objective of the BPM model was to improve the company's processes by managing and protecting internal knowledge, standardizing processes across all campus locations and orienting to the best practices relating to campus management processes and improve public management in defense of social interests and prevention of corruption. The most important results achieved thanks to the BPM model were the following: (1) ensuring knowledge management, can be rated as having been achieved, (2) standardization of processes across Jade's three campuses, (3) adoption of best practices for higher education, (4) development of a BPM-supportive culture, (5) team spirit improvement, (5) Identification of a set of cultural values, practices, and organizational characteristics that may influence the BPM culture and (6) Presentation of a set of strategies that nurture the cultural values that are supportive of BPM and hinder those that are obstacles of BPM. Finally, the model helped the organizations to gain certain crucial lessons. The most important of them are the following: (1) orienting to existing solutions like process reference models supports the initialization of new projects, (2) standardization limits the involved stakeholders' creativity, (3) guidelines for consistently documenting the implementation's progress are important to easily provide relevant information to all stakeholders at all times, (4) integrating relevant stakeholders into the process enables the standards across different locations to be determined, (5) limited project resources must be taken into account in order to plan suitable and feasible actions, (6) there is room for improvement in this large-scale example of the use of process models to structure a company's quality system, (7) handling the trade-offs among goals for safety, efficiency, and compliance is a challenge and (8) professional long-term use of models must be conscientiously pursued over time.

REMARKS

The ability to deliver projects on schedule, on budget, and aligned with business goals is key to gaining an edge in today's highly competitive global business environment. This is where project managers come in. Project managers have an incredibly complex assignment, one that blends organizational skills, an analytical mind, and adept interpersonal abilities. In the above 31 cases studies businesses and organizations employed the BPM model to solve a problem that faced. The implementation of the Business Project Management helped them come up with those problems, become more competitive and provided important lessons for the future. Certain of the most important contributions of BPM involve the following:(1) Enhance the Project Estimation Process, (2) acquire a better insight of their resource competence, (3) choose and give apriority to the most proper projects, (4) design and outline projects in a precise and consistent approach, (5) improve time allocation, (6) enhance budgeting and cost control, (7) inspire and enhance team collaboration, (8) evaluate productivity and progress, (8) enhance customer satisfaction and (9) ameliorate analytics and reporting. All in all, in all of the case-studies that were introduced and analyzed and categorized in chapter 3, managers and corporations received significant short-run and even important long-run gains, if they take advantage of the situation properly and make the right moves.

5.DISCUSSION & CONCLUSIONS

5.1 Findings and Conclusion

This section summarizes and underlines the main remarks and what was investigated in detail in the previous chapters:

Chapter 2: In this chapter of the dissertation, an overview on the topic of BPM is given. Initially, there is an introduction that goes through the fundamental principles of BPM by importing the terms “Business Process” and “lifecycle of BPM”. Then a literature review on the topic of Process Modeling and also Modeling Techniques is provided and finally the latter section gives a brief overview on Performance Measurement and Performance Measurement Systems. Each section starts with an introduction and ends with a summary which highlights the important points mentioned in each part.

Chapter 3:At this section, data about Business Project Management cases is gathered from the book “Business Process Management Cases” (Brocke&Mendling , 2017). The aim of this chapter is to raise awareness and increase knowledge exchange based on real-world BPM projects for fostering both BPM education and practice. It includes 31 real world BMR cases of organizations that followed strictly a business process management plan to accomplish excellent operational outcomes. Each of these case studies is sorted according to a uniform structure comprising the following parts: (1) Introduction, (2) Situation faced, (3) Action taken, (4) Results achieved and (5) Lessons learned. The optimization process starts with an inquiry from customer’s side who is interested into getting better and better. In order to produce innovative solutions faster and more simply, businesses starts to transform their research and development processes. The organizations moved away from complex and static project methods toward agile and simple processes, thereby significantly reducing the throughput time of the standard innovation cycle. According to the difficulties its company faced, they adopted certain strategies and actions. It was a crucial step toward overcoming the complexities that plague each businesses. To better analyze the data and come up with safe results for the 31 cases, 31 tables were created, one for each case study. Each table consisted of the following 9 categories: (1) General information, (2) Intention, (3) Core element, (4) Situation faced, (5) Life cycle, (6) Actions, (7) Model, (8)Results achieved and (9) Lessons learned.

Chapter 4: This section of the dissertation, reassure that the 31 real world BMP cases, which were mentioned in the previous chapter solved the difficulties they faced. The implementation of the Business Project Management helped them to identify the problem and the appropriate measures to come up with those problems, become more competitive and provided important lessons for the future. Certain of the most important contributions of BPM involve the following:(1) Enhance the Project Estimation Process, (2) acquire a better insight of their resource competence, (3) choose and give apriority to the most proper projects, (4) design and outline projects in a precise and consistent approach, (5) improve time allocation, (6) enhance budgeting and cost control, (7) inspire and enhance team collaboration, (8) evaluate productivity and progress, (8) enhance customer satisfaction and (9) ameliorate analytics and reporting. All in all, each study that were introduced and analyzed and categorized in chapter 3,has come to conclusions that have helped managers and corporations to receive significant short-run and even important long-run gains, if they take advantage of the situation properly and make the right decisions.

5.2 Future Prospects

Business Process Management is a research field that keeps evolving, it is no longer a “hot topic” but the “new normal”. A great process has been made since 1990s that was first introduced as a term. Process orientation, which was previously seen as something exotic, has become commonplace for most businesses. Moreover, BPM has become more much evidence based, exploiting the spectacular growth of event data available. However, the actual practice of BPM is scarcely documented in literature. BPM is not a static area of interest, the continuous changes in the international and domestic market demands rapid and drastic decisions. It makes no sense to concentrate on process modeling without considering the streams of actual data in and between today’s companies. Recent progress in process mining make it possible to use process models as the “lens” to look at low level event data. Such a “process lens” helps to understand and solve compliance and performance-related problems. The emphasis on information analysis is good, but should not obstruct process orientation. In the end, good processes are more essential than data systems and conventional analytics.

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