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Corporate development with agile business process modeling as a key success factor

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Abstract

Business processes represent an important core component of the company's activities and should be therefore more considerate. It takes a long time until the processes modeled down to the smallest detail, analyzed and designed. When these steps have been completed, often the process will not be adapted. Here would be an agile approach interesting to be flexible on trends and enterprise decisions which will have any dependencies to the processes. For this reason, the purpose of this study is to develop a holistic approach, in which the advantages of the previous models can be optimally used and the current challenges such as the desired agility can be included. The research methodology used in the investigation consists of a combination of methods and tools of Business Process Management (BPM) and agile management. The aim of the research is to evaluate whether these methods can contribute positively to the process modeling improvement in the framework of the Enterprise Information System. The finding of this research consists of a holistic model for acting agile within BPM. This allows companies to act flexible to adapt or implement enterprise processes. The resulting added value can be seen in the model for flexible implementation with regular controlling which are set apart from the previous rigid waterfall models.

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Keywords:, Business Process Management, Business Process Modeling and Notation, Agile management, Scrum, Enterprise Information Management

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1. Introduction

Social, technological, political and economic changes in the environment represent significant market challenges that face organizations to be successful[1]. This information will become increasingly important, either as a basis of service provision or decisive for planning, management and control of business processes[2]. The totality of all information processes in the company is described in the literature as the Enterprise Information System (EIS)[3]. EIS supports service processes and exchange relations within the company and between the company and the environment with the target of providing information in: the correct information, the right amount, in the proper form, at the right time, the right place and with the correct quality[4].

For an efficient and effective corporate design, a comprehensive view of the information and processes in the company will be necessary. Market opportunities and difficult risks often arise unexpectedly and disappear as quickly as they have opened up. In order to make optimal use of risks or opportunities and the potential of trends a completely new, fast and economical form of business strategies is needed. Changes in market structures, an increasingly prominent competitive dynamic, as well as changes of consumer behavior can be understood as factors which have an enormous impact on companies and their processes[5]. The resulting variety of products, distribution channels and interfaces lead to increasing coordination effort within the functional areas of the enterprise[6]. Such a complex socio-technical system (as company is) includes interdependent resources of people, information and technology which have to interact with each other and their environment[2]. To support the best interaction, coordinated business processes are mandatory are an important basis for the companies[4].

The focus in this paper is to create a holistic approach for an agile sustained process implementation, to respond flexibly to necessary process changes. To check which process should be adapted the use of process indicators for underlying will be helpful. The literature on this subject is extensive with a variety of models of business process modeling.

The basis of this analysis forms the Business Process Management (BPM) which is engaged in the identification, design, documentation, implementation, controlling and improvement of business processes[7]. As standard modeling method Business Process Modeling Notation (BPMN) can be conducted[8]. In order for a possible flexible fulfillment the Scrum method is applied as the Agile process model for Agile project management. By applying the disadvantages of rigid waterfall models should be avoided.

By combining these approaches of BPM and Agile process management with Scrum, a flexible approach will be designed to close the research gap for a fast way of identifying and closing process lacks in companies and to understand BPM not just as a project than more as a holistic optimization model in the business. The presented research is supported by structured empirical surveys in companies and their application and assessment of the developed process model.

2. Scientific Basis of the Research

At the beginning of the research the mandatory explanation of the core components is made. The subsequent analysis and development of the model requires a common understanding of the core concepts.

2.1. Business Process Management

Without Business Process Management there is no Business Process Modeling and Notation[9]. Based on the definition of the European Association of BPM (EABPM), a process is considered as a number of specified activities, which are carried out by people or machines for generating a company's value[9]. Business processes are defined within a business model as a functional and organizational-border linkage of value-added activities that generate the expected customer benefits and convert the business strategy derived process goals[10].

Business Process Management serves as a systematic approach to detect, customize, execute, document, measure, monitor and control automated- and not automated processes[9]. The aim is therefore to achieve the strategic and operational enterprise objectives as well as the increase of effectiveness and efficiency[14]. The business processes should be aligned with the business strategy, customer needs and business objectives, so that the achievement of process objectives can be measured and controlled.

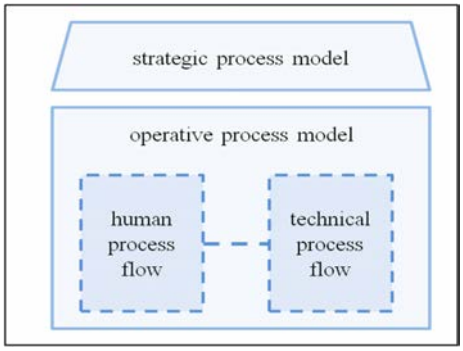

Fig.1. The Camunda BPMN-house

Deriving from the fundamental objective of the achievement of corporate objectives, it becomes clear that this is an approach of "end-to-end process" consideration, which means business processes with focus on customers[10]. BPM is not just optimizing individual operational processes but rather the strategic orientation and operational implementation of the corporate goals[10]. BPM is understood as an integrated approach considering the systematic design on the management and control to the further development of the business processes[10]. BPM therefore covers the strategic process management as well as the process design, process implementation and process controlling[13]. This holistic approach to BPM indicates an overall analysis of the strategic- and operational perspective illustrating a basic requirement for a successful application like can be seen in Fig.1.

Chang notes that the BPM is implemented as part of a project[10]. The realization can be carried out by a variety of process models. The most widely used in practice is the waterfall model, in which the implemented topics are realized in six subsequent steps[11]. The resulting disadvantages of inflexibility and the results can be seen only after the complete realization - thus no iterative implementation will be possible and no support of parallel tasks are just a few issues by using the waterfall model[11].

It becomes clear, that Business processes are an essential component of any competitive advantage[12]. For this reason, every company should apply the understanding to see processes not only as a compulsory task in corporate management, rather the ability to develop the organization with new requirements and processes constantly. In most enterprises, business processes are now displayed in the IT or are supported by IT. This combination of IT and processes has become increasingly important in the last view years[12].

2.2. Business Process Modeling Notation

The literature provides a variety of modeling languages and tools for the design of processes. In addition to using flowcharts or event-driven process chains in practice increasingly the Business Process Modeling Notation (BPMN) is used as a new standard worldwide in a short time[14]. BPMN as a part of BPM tools is used for the holistic, precise, and formal and consist description of business processes[14]. The benefits of process modeling are:

- Creating transparency over business processes;
- Clear and comprehensive documentation of business processes as a prerequisite for automation;
- Communication of business processes and promote understanding of the process;
- Analysis, measurement, controlling, benchmarking and optimization of business processes;
- As well as risk and compliance Management[15].

As shown in Fig. 1, a separation between the strategic- and operative process modeling is carried out in practice[8]. This is necessary in order to describe on the basis of the requirements definition the process flows from an application perspective to the process activities, the process structure, process results, roles, business rules, involved organizational units and resources. The implementation of the professional model requires a technical process model, in which the detailed information such as interfaces, input and output data or services are contained[8]. This abstract sequence of modeling levels can be seen in the Fig. 2[14]. The execution of the designed processes is carried out on BPM Systems or Workflow Management Systems.

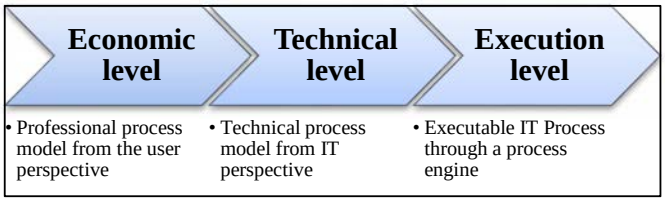

Fig.2. Modelling levels

2.3. Scrum - Agile Method

The implementation and adaptation of processes within the BPM is often achieved in practice through projects.[9] In order to operate as a company to the increasingly dynamic, more uncertain and complex environment, innovation, flexibility, speed and willingness to change play a major role. In such turbulent company environment, in which objectives change constantly, push conventional projects to their limits, due to the classical phase models and problem solving methods[15]. The best known and most widespread method is Scrum[16]. It is one of several existing so-called agile practices for project management. Scrum knows superficially three roles for directly at the process involved people, the Product Owner (sets technical requirements and prioritizes them), the Scrum Master (manages the process and removes obstacles), the Team (developed product)[16].

In addition, there are an observer and an adviser to the stakeholders. The Scrum approach is empirical, incremental, iterative and based on the view that large projects are often too complex, so it can be scheduled consistently[16]. Scrum is based on the recognition that it is much easier to develop a large-scale project in several increments.[16] It is started with a focus on high Priority and worked its way to low Priority[16]. The advantages consist in productivity increasing, continuous development and process improvement; improving communication within the development team, between Scrum team and customer in order to faster the time to market[17]. For the successful application of a detailed preparation and planning, corporate culture should support cross-functional cooperation[16].

2.4. Evaluation of the scientific status

The theory shows that BPM and Scrum are mainly considered separately. To meet the need for more flexibility, the theoretical approaches to BPM and Scrum were bring together. On the basis of these findings a model was created as a holistic approach to identify the Key points of BPM as the Basis for BPMN in the age of digitalization. It is important to mention here that the various modeling Levels of Fig. 2 are considered. The approach on the economics level should be done first and then the consideration of the technical level. This approach also, reflects on the Camunda house (according to the implementations supported by https://camunda.com/bpm/features/) where strategic approach is modeled first and then follows the operational point of view.

2.5. The holistic agile BPM model

Based on the scientific status, a holistic model was developed. It was designed on the basis of the theoretical study and was understood to be use for BPM as a holistic flexible approach for process optimization in the enterprises. This agile BPM approach is presented in Fig. 3. The core of the model are the “6 BPM steps”. This is complemented to the use of the agile methodology Scrum, in order to respond flexible to the new customers’ requirements and to include them in the business processes shortly. The Scrum process takes place iteratively and consists of six individual process steps, similar to the Scrum principle for the IT development. In the BPM Modeling step, the transition to Scrum take place when the new or optimizing process is complete defined in detail. It is useful to divide a complex and far-reaching process into sub-processes and adapt them systematically to the new requirements. This creates a Process Backlog, which is to be gradually worked off.

For the proposed holistic approach of agile BPM model, it is important that the non-value added processes to be analyzed and monitored, too. After the newly designed process is mapped (design and modeling), executing and testing is carried out directly from the Scrum process.

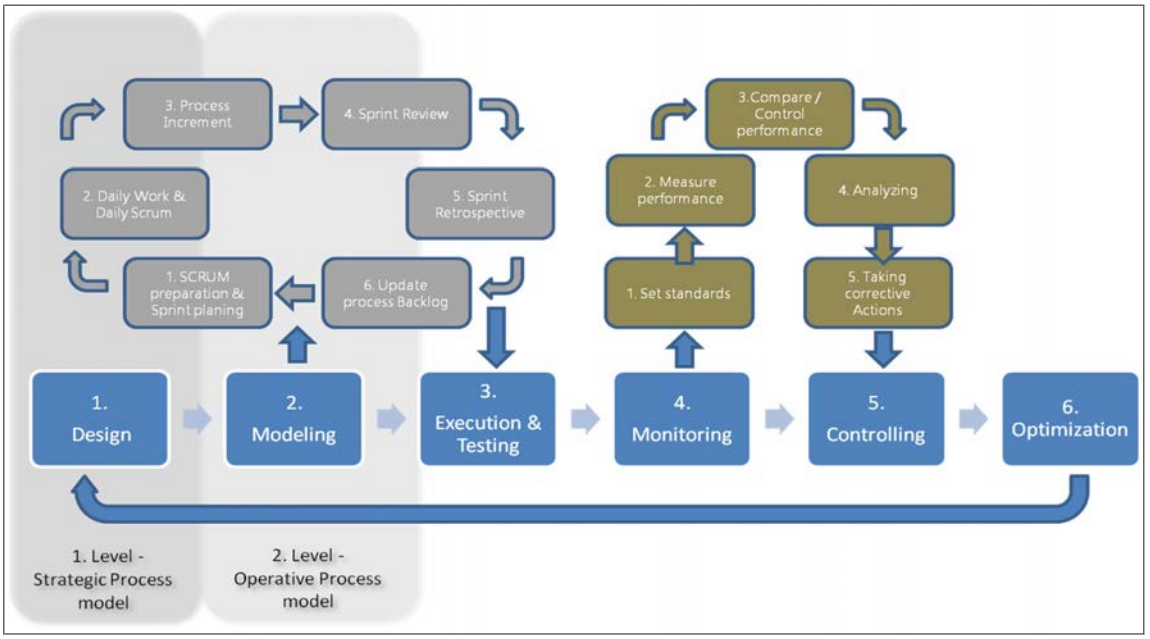

Fig.3. Holistic agile BPM model

To check whether the adjustments which are made to achieve the desired objective, the definition of performance indicators for the monitoring and controlling as benchmarking will be mandatory. These “5-controlling steps” should generally applied in BPM to make the adjustments and impacts measurable and thus be able to make an assessment.

As can be seen in Fig. 3, the first BPM phase runs in the strategic process level. It is superficially about the involvement of process owners, process managers and process participants in the first phase of the process improvement. The claim in this phase is on the results-oriented illustration of and coarse understanding of the proposed process flow. Special BPMN skills are not required, as opposed to second BPM Step, the modeling in the operational process model. Here, the operational details of the actual processing in the form of human and technical process flows are modeled. Because of the interfaces between the technical and human processes, a common approach is indispensable, as described in Fig. 1, the Camunda house outlines. The execution can be supported by process engines, but it’s not the focus of the model.

The implementation should be carried out by a team with process experience in analyzing and implementation. In order to make the appropriate adjustment the colleagues who work operationally in the process, should be included in the optimization, in order to detect possible impacts and errors early. The BPM and controlling process should be established as regular tasks in the company with IT support and should not be treated as a onetime project. This iterative approach is intended to indicate continuous improvement. This is supported visually by the arrow from Step six to Step one and symbolizes the constant repetition changes in the process and on the basis of previously defined indicators can identified and the cause can be analyzed.

2.6. The Survey Description

For the survey of this study the anonymous survey method was used and was structured in four parts. The survey started with the introduction of the topic and the objective. Afterwards the guidance for completing was described. As the third point followed the topical main part with dichotomous questions, grouping and rating questions like the

Likert Scale and open questions. Afterwards the collection of socio-demographic information followed. The study was carried out in two steps early 2016. Some main questions of the questionnaire were: How important is the business process modeling in your company and why? What are reasons for process changes from your perspective and how will this modified in the context of digitalization? Are the expected objectives of the company occurred through the process adjustments? How often do you check your processes by defined parameters or indicators?

First, the basic parameters and Knowhow and Skills in terms of BPM, Scrum, BPMN of the subjects were collected. It was ensured that the subjects present their experiences of BPM projects and represent open trouble spots. The focus of the first part of the survey was the derivation and description of practical experiences BPM and BPMN approaches in the company.

In the second part of the survey, the BPM model has been extended to the agile Scrum methodology and explained fundamentally. Important in this context was the description of the agile approach Scrum and the reconciliation to the planned application in process management. In order for a possible assessment of the new approach, participants should bring their presented methodology and the new model in a comparative reference by a case study in the survey.

Target persons were mainly directors, managers, and employees in the consulting area (In-house consulting), Controlling area, Innovations and quality management and employees with direct work activities for process modeling, process analysis and implementation. The base value of 242 evaluable replies from a total of 68 different companies from 6 different industries underlies the evaluation. All participants have minimum 3 years of experience with BPM. 65% of respondents are certified project manager, Scrum Master/ Scrum Product Owner. The language of the survey was in English and German. The customer relationship is generally in a good relationship and the participants are interest-free.

2.7. Results of the survey

In the following, the results of the survey are presented and the resulting priorities for the developed model are shown. An important requirement of the study was to acquire a group of volunteers from various sectors and with BPM experience to have recourse to a solid wealth of experience to answer. All 242 participants in the study have experience in BPM, BPMN and project management. While the volunteers BPM and project management already applied to 100%, compared only 85% of the respondents have worked with BPMN. Because not the active Modeling with BPMN is the focus of the analysis, rather the process model, this experience gap will be negligible. It is striking that 69% of the respondents have experience in Agile project management. This suggests that the use of agile methods like Scrum is not introduced everywhere.

Fig. 4 shows that over the different sectors the desire for more flexibility is through the use of BPM with 27%. With 23% on average quality improvement and process cost reduction are called as second targets to the use of BPM. 19% see the continuous improvement as a goal of BPM, even 9% monitoring of the process performance. Already here it becomes clear that the controlling of BPM processes is less of a target. This low value leads to the conclusion that only an average of one-tenth of the participants collects information about their processes to analyze and evaluate them.

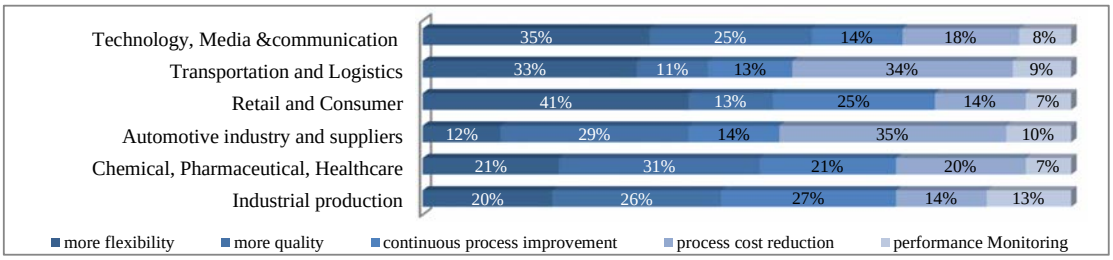

Fig.4. Focal point of BPM to industries

Despite its flexibility having the highest target focus with 27% in the middle of the BPM survey, 60% of the volunteers ever had experience with Scrum as Agile project methodology. Moreover, it can be seen that the six

different industries pursue different focal points and targets. While the retail and consumer sector sets the highest value on flexibility with 41% in the automotive industry and suppliers the focus point at least with 12%. The various forms can be used on further analysis of the topic. Crucial for the model were the averaged values of the different industry sectors.

In the more extensive analysis is figured out on what processes the BPM is applied in practice, like can be seen in Fig. 5. Almost half of the respondents use BPM mainly for the core processes in the company. 15% uses BPM for the support processes and compared with 32% which are using BPM for all processes in the company.

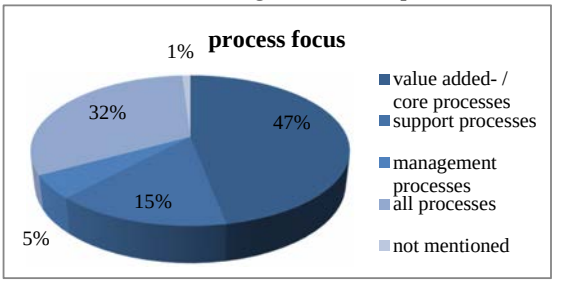

Fig.5. Research results on Process focus

Considering the Process models and the dependencies of the value-adding and supporting processes described in the literature can be deduced that many companies do not over all process analysis and thus appropriate potential is not retrieved. It is apparent that the majority of respondents are using the BPM methodology limited only to individual processes and not in a holistically approach. Furthermore, the participants were interviewed to the frequency of process analysis and process adaptation in their enterprises. Relevant research results of the developed survey have underlined the following aspects:

- The results show that 81% of respondents do not carry out a regular, fundamental process analysis based on comprehensive process indicators according to the process definition, adaptation and implementation;
- Furthermore, it became clear that 37% of the 81% do not know whether the adjustments made were successful or not. It has to be assumed that here no comparative values are collected for benchmarking. In combination with the low controlling value from Fig. 3 can be seen that practice processes will be defined and not reviewed after the implementation;
- Starting from the 81% the company processes are analyzed on average 1.5 times a year and in 50% without IT support, however what is not a requirement;
- 19% of participants indicated that they use a continuous process controlling via Process indicators to monitors process changes continuously and make further adjustments on the processes if necessary;
- All participants of companies, which do regular analysis are using IT support and evaluate the collected process data in average on a monthly base. By newly implemented processes a daily and weekly evaluation will take place to identify possible reasons for deviations shortly. Thus, a short-term adjustment of the process is possible and comprehensible. These values may differ depending on the industrial sector.

In a second part of the study by the same participants, the developed holistic model to the agile approach in BPM was presented. Without profound going into the details, 75% of the participants analyzed that their current alignment neither is flexible nor a process controlling for checking the achievement of objectives is implemented. The concept of the “Agile Model”, modeling new processes agile and make a continuous adjustment and further development of established processes was assessed as strategically necessary by 95% of the participants. Furthermore, the model was seen as workflow illustration to perform a holistic and agile process management.

2.8. Pre Conclusion

By using the holistic approach in Business Process Management it should be possible to respond flexibly to internal and external changes and trends through the agile component Scrum. Deriving from the study four key messages can highlighted:

1. The primary objective of BPM in practice constitutes the increase of flexibility;
2. BPM is mainly applied to the value-adding processes and not holistically about all processes in the company;
3. The majority of respondents work without performance indicators so that a comparison and evaluation of a process is made more difficult;
4. Less than 20% perform regular process analyzes and evaluations and don't improve the processes continuously.

The study has shown that in particular the process of process controlling, which is established as a basic step in the BPM process model, is not given sufficient attention in practice. So, the companies have no base data for any kind of process evaluation or further change. Based on the new approach an enhanced perception should be achieved by the users, with the understanding that process controlling is a fundamental and regular task in BPM. Not only the value-added processes, which are also referred as core processes of enterprises, should be adapted for new requirements and trends, but also should be considered as supporting processes.

3. Conclusion

The analysis has shown the currently dominating weaknesses and difficulties in the understanding of BPM in practice. The developed model enables being proactive on these weaknesses, so that these can be developed to strengths. The goal of increased flexibility is in the foreground to act agile on new demands from the corporate environment. With the new model, it is possible to optimize agile and sustainable process. This can be done in sub-processes in order to achieve continuous improvement. Here, the controlling of indicators plays an important part in order to evaluate the changes and from this to derive new follow-up steps. Agility requires continued intensive communication between all participants, creates transparency on the progress, transfers responsibility to the team, forcing radical prioritization. The regular use of this model supports the continuous development of processes in the company and thereby contributes to the achievement of enterprise objectives. In addition, the understanding should accumulate in practice that BPM has to be performed continuously to react to new circumstances and not as a one-off project. The correct application of the model in practice can be generate a clear added value, as the assessment has been shown by the expert study.

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