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The challenge to determine a company's process maturity: a case study from the financial services industry

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Purpose. Conducting projects to improve a company's business processes is of utmost importance in all industries and countries. Many companies have installed specific organizational units to develop guidelines for process design, to document and maintain of these processes, and to further increase the processes' efficiency. Although these enterprises continually work on improving their processes, they often struggle to answer the question on the current status of the maturity of their processes. Therefore, the purpose of this work is to characterize the methodology, applicability, pitfalls and benefits of analyzing the maturity of processes.

Design/Method/Approach. This work is based on mixed-methods research recently conducted in a medium-sized German bank.

Findings. The paper defined the benefits of measuring the level of maturity of the company's processes clearly. This work identified the substantial theoretical drawbacks, such as, for example, the lack of considering of process innovation in the extant models of process maturity.

Limitations. Naturally, a research limitation is the analysis of a specific company in the financial services sector.

Theoretical implications. From a theoretical point of view it is critical to choose the appropriate model out of a variety of available process maturity models. In fact, the selection of the model influences the data, the subsequent interpretation of these data, and the conclusions to be drawn for the company.

Originality/Value. The paper is novel as it presents–based on empirical data–the measurement of process maturity including the derivation of implications from both an academic and a practical perspective. In addition, the impact of process maturity on perceived process performance could be shown.

Paper type – empirical.

Keywords: banking; process maturity; process management; operational excellence.

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Задача визначення процесу зрілості компанії: соціологічне дослідження у галузі фінансових послуг

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Мета дослідження/Дослідницьке питання.
Здійснення проектів з поліпшення бізнес-процесів компанії – пріоритет у всіх галузях промисловості в кожній країні. Багато компаній створили спеціалізовані підрозділи для розробки директив по створенню процесів, їх документації та впровадження, а також для подальшого поліпшення їх ефективності. Не дивлячись на те, що ці компанії постійно працюють над вдосконаленням своїх процесів, вони часто не можуть дати відповідь на питання про поточний стан і зрілість своїх процесів (process maturity). Тому мета цієї роботи – охарактеризувати методологію, застосування, проблеми та переваги аналізу зрілості процесів.

Дизайн/Метод/Підхід дослідження. Це дослідження засновано на змішаному методі аналізу (mixed method analysis), застосованому в банку середнього розміру в Німеччині.

Результати дослідження. Чітко визначенно переваги вимірювання рівня зрілості процесів компанії. Виявлено істотні теоретичні прогалини, такі, як, наприклад, брак розуміння інновації процесів у існуючих моделях зрілості процесів.

Обмеження дослідження. Очевидний обмежуючий фактор – аналіз даних здійснено тільки за однією специфічною компанією фінансового сектора.

Теоретичне значення дослідження. З точки зору теорії критичним фактором є вибір відповідної моделі з ряду існуючих на даний момен моделей зрілості процесів. Практично – вибір моделі впливає на зібрані дані, подальшу їх інтерпретацію та на висновки, які для себе зробить компанія.

Оригінальність/Цінність/Наукова новизна дослідження. Оригінальність дослідження полягає у тому, що запропоновано підхід до оцінки зрілості процесів, який базується на обробці та аналізі емпіричних даних, і зроблено низку висновків для теорії і практики. Крім цього, його застосування дозволяє показати вплив зрілості процесів на сприйняття результативності роботи компанії.

Тип статті – емпірична.

Ключові слова: банки; зрілість процесів; управління процесами; виробнича ефективність.

Задача определения процесса зрелости компании: социологическое исследование в сфере финансовых услуг

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Цель исследования/Исследовательский вопрос.
Осуществление проектов по улучшению бизнес-процессов компании – приоритет во всех отраслях промышленности в каждой стране. Многие компании создали специализированные подразделения для разработки директив по созданию процессов, их документации и внедрению, а также для дальнейшего улучшения их эффективности. Не смотря на постоянную работу компаний над совершенствованием своих процессов, они часто не могут дать ответ на вопрос о текущем состоянии и зрелости своих процессов (process maturity). Поэтому цель этой работы – охарактеризовать методологию, применимость, проблемы и преимущества анализа зрелости процессов.

Дизайн/Метод/Подход исследования. Данное исследование основано на смешанном методе анализа (mixed method analysis), примененном в банке среднего размера в Германии.

Результаты исследования. Четко определены преимущества измерения уровня зрелости процессов компании. Выявлены существенные теоретические пробелы, такие как, например, недостаток понимания инновации процессов в существующих моделях зрелости процессов.

Ограничения исследования. Очевидный ограничивающий фактор – анализ данных проведен только по одной специфической компании финансового сектора.

Теоретическое значение исследования. С точки зрения теории критическим фактором является выбор подходящей модели из ряда существующих на данный момент моделей зрелости процессов. Практически – выбор модели влияет на собранные данные, последующую их интерпретацию и на выводы, которые для себя сделает компания.

Оригинальность/Ценность/Научная новизна исследования. Оригинальность исследования заключается в том, что предложен подход к оценке зрелости процессов, который основан на обработке и анализе эмпирических данных, и сделанны выводы для теории и практики. Помимо этого его применение позволяет показать влияние зрелости процессов на восприятие результативности работы компании.

Тип статьи – эмпирическая.

Ключевые слова: банки; зрелость процессов; управление процессами; производственная эффективность.

Introduction

In recent years, process management evolved and is a highly relevant field with the aim to permanently improve the organizational performance of companies. Initiatives in this area often bear names such as Operational Excellence, Lean Management, Six Sigma, or Continuous Improvement Program. These initiatives, though, do not tell us about the maturity of the processes in the respective company and the influence of the process maturity on organizational performance. To increase a company's performance it is essential to know the current maturity level of the processes, to know which level of maturity is actually envisaged, and how the development towards this aspired maturity level should be accomplished.

However, there is a multitude of opinions around what a process maturity level is in the first place. Different measurement models exist, that lead to different results. In practice, a number of further questions occur, which are only rarely touched upon in the available text books on business process management (e.g., Dumas et al., 2013; Harmon, 2014; Schmelzer and Sesselmann, 2013), if at all. For instance, it has to be decided, whether the maturity of the processes or the maturity of the process management should be measured. Other questions are whether the maturity of all processes of the company should be measured or the maturity of a certain process or a certain type of processes. Furthermore, it should be checked in advance whether the process including the involved employees can be isolated to enable a clear cut measurement. Another challenge is that often a transparent process architecture of the company is not available. In other cases, end-to-end processes, i.e. defined across departmental borders, have not yet been developed.

Research Questions

In spite of a wide coverage of business process maturity in the academic literature, almost no works on the application and the resulting consequences in the real world exist. Thus the research questions of this paper are: How can a company's process maturity be determined? What are the methodological shortcomings and benefits from both an academic and a practical perspective?

Based on a real case, this paper aims to contribute to a better understanding of the implications of applying process maturity models. To the research questions in the next section the theoretical basis for measuring process maturity will be laid. In the third section we will present the methodology applied to a specific company in the financial services industry, i.e. a medium-sized bank located in Germany. The fourth section delivers the results of our case study and the interpretation of the results. Implications for theory and practice will be offered in the fifth section. The paper ends with a conclusion in the sixth section.

Concept of maturity measurement

The idea of maturity models stems from the IT (information technology) sector. Here a number of approaches are known to measure the maturity of information systems and to support the professional advancement. The most famous model is the CMM (Capability Maturity Model) of the Software Engineering Institute (SEI) at Carnegie Mellon University. Today, this model, known as CMM Integration (CMMI), is available for a number of other application areas than IT.

The application of maturity models in the sphere of business process management (BPM) aims to help companies to transform themselves into process-oriented and customer-centric organizations, by providing some sort of a "roadmap" for the gradual further development of the company. By means of „business process capabilities", which can be interpreted as critical success factors for good business processes, the maturity level of the respective company is determined.

In BPM literature a variety of models are known (e.g., Röglinger et al., 2012). The application of these models depends much on what users understand as a „maturity level". Following the CMMI tradition, the maturity of a single business process can be measured or the maturity of the whole process portfolio of a company.

According to van Looy and colleagues (2011), it should be differentiated, whether the maturity level is limited on aspects of the classic process maturity cycle (i.e., modeling, documentation, usage, improvement, and monitoring of processes) or whether it also includes the maturity regarding a process-oriented corporate culture or, going even further, the implementation of a process-based organizational structure of the company.

Thus, the concept of process maturity is rather an umbrella term for the level of development of business processes. Accordingly, when selecting the adequate process maturity model, it has to be taken care of, whether the model really measures, what should be measured in the specific company. In this paper we follow the European Association of Business Process Management, which understands the assessment of maturity as „... a systematic analysis of the strengths and weaknesses of a process management system in the sense of a location determination or self-diagnosis" (EABPM, 2014, p. 324).

Most maturity models are based on five levels (Fig. 1). The steps of development should lead the company from the lowest to the highest level of process maturity. While the first level is characterized by an underdeveloped process understanding, at the fifth level the company has defined end-to-end processes, whose results are stable and permanently monitored and improved. The five levels of maturity are described in detail e.g. by Hogrebe and Nüttgens (2009).

A maturity model operates like a navigation system that explains step-by-step what has to be done to finally achieve process excellence. However, the optimal status for a company has not necessarily to be the highest level of the maturity model. The process maturity level should rather fit to the company and its individual strategy (van Looy et al., 2013).

In many industries (e.g., automotive, military) it is common, that clients prescribe a defined maturity level for the prospective supplier in their call for proposals. Also in the outsourcing sector, partners will only be accepted if they can prove a high level of process maturity. Kamprath (2009) emphasizes, however, that according to CMMI, the actually realized maturity level of many companies is level 2 or 3 and therefore only very few companies run on level 4 or higher.

De Bruin and Rosemann (2007) point out, that the plain focus on business processes is too short-sighted. Today, process management follows a holistic approach and includes topics like Strategic Alignment, Governance, Methods, Information Systems, Employees, and Corporate Culture as important parts (Rosemann and vom Brocke, 2015). Thus, the complexity of current process management is rather high and imposes tough conceptual requirements for the adequate measurement of maturity.

There is no doubt that even advanced maturity models are simplifying reality too much. However, several studies show a significant relation between measured process maturity and the actual business (process) performance (McCormack, 2007; Škrinjar et al., 2008). Hence it appears worthwhile, despite potential limitations, to determine and to improve the process maturity of companies.

Methodology

The procedure of measuring process maturity will be explained using the example of a medium-sized German bank, with around 600 employees. The bank focuses on business with wealthy private clients and runs several locations in Germany and Luxembourg. In the following, we describe the selection of the process maturity model to be used, the development of the questionnaire for determining the bank's process maturity, as well as data collection specifics.

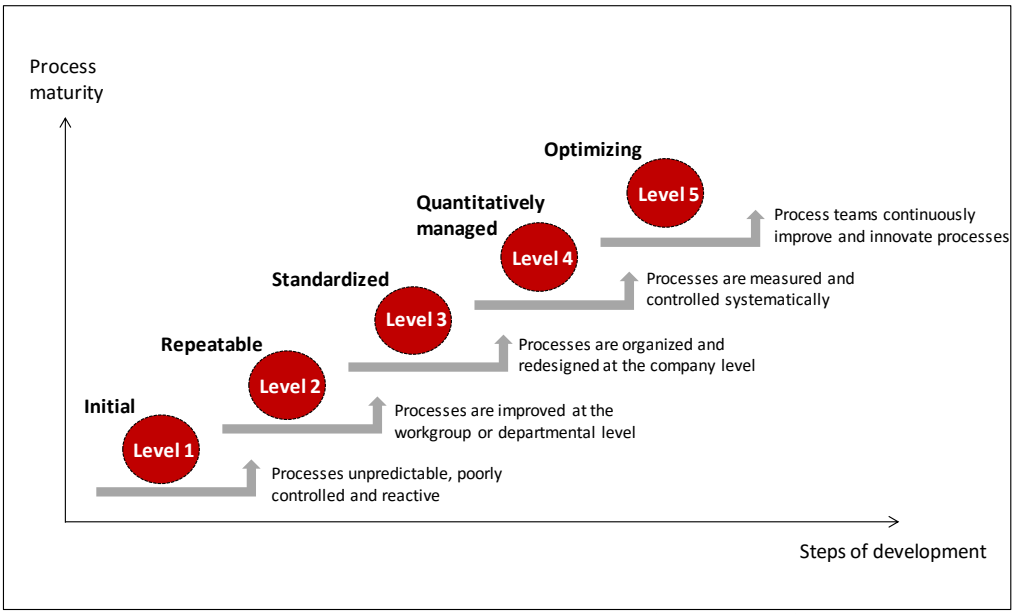

Fig. 1. Maturity model based on OMG (2008, pp. 72-78)

Selection of the Maturity Model

First of all, from the plethora of available models we had to choose a maturity model which fits to the bank. In this case we decided for the Business Process Maturity Modell (BPMM) of the Object Management Group (OMG, 2008). An important argument for the OMG model was the clear concept including a catalogue of easy-to-apply criteria for process maturity. Furthermore, there are extensive guidelines for further steps of process improvement available. Another reason was that we aim to determine the level of process maturity and not the maturity of the whole process management.

Our project aimed to perform an initial assessment and not a complete investigation of the bank's process maturity. Therefore, based on the OMG model, we developed a simplified procedure for estimating the process maturity of the bank.

Development of the Questionnaire

Usually process maturity is assessed based on a set of questions. Accordingly, a catalogue of questions had to be developed. The data generated from this questionnaire was the foundation to determine the bank's process maturity. However, the original description of the OMG model was of limited help for the specific application. Therefore we referred to an additional and detailed report (Minonne et al., 2011). This report contains comprehensive information on characteristics of process maturity levels. On this basis we developed our own questionnaire.

The questionnaire consists of four parts. In the first part we asked for demographic data of the participants (actual position within the bank; front or back office; type of the business process the participant currently works in; age; gender). In the second part we wanted to evaluate the level of process understanding of the participants (7 questions). Those data should provide information, how the bank's employees estimate their current activities from the perspective of process thinking. The third part aimed to assess the current level of maturity of the bank's processes based on the employees' perception. This part was the most comprehensive and important part of our research (15 questions). For each maturity level two to five questions were asked. In the fourth part of the questionnaire we assessed the perceived process performance, which was determined by performance criteria like time, costs, quality, and innovativeness (10 questions).

A particularly exciting issue of research on maturity levels is, whether there is an interrelation between process maturity and process performance. This question is interesting, because the assessment and improvement of process maturity should not be an end in itself, rather it should help the bank to further develop its process performance.

The items used in the questionnaire (i.e., statements which reflect the criteria for evaluating process understanding, process maturity, and perceived process performance – the so-called "process capabilities") were formulated in such a way, that they could be understood throughout the whole organization. To achieve this, a consistent and clear phrasing of the items was strictly needed. This applies especially to a firm whose employees have a heterogeneous understanding of processes. Hence, the questions were phrased in a way to avoid technical terms and to describe matters as unrelated to processes as well as understandable for each level of knowledge. In addition, definitions were given at the beginning for each topic to ensure a uniform understanding. The subject "process maturity" was not explicitly mentioned to attain results as objectively as possible. It was also important to avoid leading questions. Control questions were included to ensure validity of the survey. For the scale we chose a 5-point Likert scale (1 = strongly agree; 5 = strongly disagree).

Data Collection

The questionnaire was delivered to all employees – from top management to those employees without any management responsibilities. Here, the research project was supported by the bank's process team. The questionnaire was sent to all employees by means of a link leading to an online questionnaire. Exactly 100 persons participated in the survey, i.e. 17% of all employees of the bank. All participants filled out the questionnaires completely; thus all data could be used (n=100). The majority of the participants were employees without any management function (75%), next to employees in middle management (20%), whereas the remaining 5% were from top management (board members and the next lower hierarchical level). Most participants were from back office departments (62%), while the remaining 38% are working in the front office area. The majority of the participants (46%) can be related to support processes of the bank, 43% to the core processes, and 11% to management processes. 55% of the participants were males, 45% were females.

Results

Statistical Tests

Before starting the analysis, we statistically verified the survey. This included Cronbach's alpha tests, the determination of the discriminatory power of the items and a t-test. All tests were conducted using SPSS Statistics 21.

The Cronbach's alpha tests resulted in the elimination of some items of the initial questionnaire. The remaining items were above the required 0.8 (*Bortz and Döring, 2006*).

With regard to the determination of the maturity level we found statistically significant results. The data revealed, however, that the five items, which belong to the first process maturity level, were not comparable with those items, which represented the other four maturity levels. A reason could be that items of the first maturity level appear too trivial compared to the items of other maturity levels. In the OMG model the first process maturity level serves as the initial position for the following four levels and does not require a dedicated process understanding. Accordingly, at this level only individual work matters and not an overarching process orientation (*Hogrebe and Nüttgens, 2009*). Hence, we decided to eliminate all items, which are related to the first maturity level, because of their negative or low correlation with other items. This step resulted in a Cronbach's alpha of 0.87.

Finally, a one-sample t-test in form of a mean test was performed. On a scale from 1 to 5, we defined 3 as average. Then we conducted the test for parts 2 to 4 of the questionnaire (Assumption: sample size is normally distributed and >50, following Bortz and Döring, 2006).

Analysis of the Data

The results reveal that the employees of the bank are overall well informed, for which activities they are responsible within a process. Also they generally know about the connection between the goals of the sub processes and the goals of the complete process. Based on this, we may assume that a fundamental process understanding exists. A detailed analysis showed a more pronounced process understanding on the side of back-office employees in comparison to front-office employees. This observation can also be made in many other industries, because process improvement initiatives typically begin in the back-office area and thus the process affinity is stronger there.

After removing the items for the first maturity level, based on the statistical tests, the second maturity level came into the focus of our analysis. The process capabilities, which are needed to reach the next higher maturity level 3, were only partially fulfilled based on the collected data. Analogous to process understanding, the analysis revealed, that on average back-office employees rated the items of maturity level 2 higher compared to their front-office colleagues.

The answers regarding the items of maturity level 3 and 4 showed far lower values. This means, that most of the participants disagreed with the criteria or decided for the mean value of the particular items. The overall consideration of the data led to the conclusion that a classification into maturity level 3 or even 4 were out of question. Hence, maturity level 5 could also be excluded.

Contrary to literature, where the steps of the OMG maturity model build up on each other, our respondents did not share this understanding. Rather the items of maturity level 5 showed consent again, after lower values at levels 3 and 4. Our explanation is that continuous improvement of the bank plays an important role for the participants; this might have led to the relatively high approval. However, the further requirements for maturity level 5, which explicitly include radical process innovation, were in no way fulfilled. We assume that the activities of level 5 were not perceived as a separate level, but are reflected in all previous levels (self-reference). With regard to the perceived process performance we noticed a slightly positive result. In order to measure the process performance, we used four criteria in our questionnaire – innovation, quality, cost, and time. The analysis revealed a moderate consent to the items. This approval was by no means shared by all employees though. The answers rather indicate, that there is a considerable potential for improvement in terms of innovativeness, quality, cost cutting and time reduction concerning the processes of the bank.

Talks with Experts in the Bank

Internal preliminary assessments had suggested that process thinking is in an early stage in the bank, so that a relatively low understanding for the topic of process maturity was to be expected. Therefore, from the beginning a series of complementary expert interviews to validate the survey results was planned and after the end of the survey period conducted.

These interviews were carried out by means of a standardized questionnaire. We presented the results of the survey to the experts, which consist mostly of employees of the bank's process team. They were asked to provide us with an assessment from their point of view. These talks were very important for the validation of the collected data and helped interpret our results. The insights gained from those interviews were part of the final determination of the bank's process maturity level.

Determination of the Maturity Level

The survey results indicated already, that a concrete determination of the maturity level on the basis of purely quantitative data would be difficult. In addition, the interviews did not lead to a clear-cut result. In coordination with the process team the use of weighting factors was considered, e.g. to differentiate between front- and back-office. However, this discussion did not lead to a convincing result and thus this idea did not achieve acceptance.

Finally, the combination of quantitative and qualitative data led to the determination of the bank's process maturity level. Because a consistent base for calculating maturity levels is missing in the literature, we calculated the maturity level with the help of mean values based on the survey results. For this purpose, the mean values of the maturity items of levels 2, 3, 4, and 5 were calculated. The first maturity level was excluded, because the items had been eliminated as explained above. The mean values were analyzed and critically scrutinized. Next, the results of the expert interviews and the numerical data were compared. After a final discussion the maturity level 2 for the bank was determined in consent with the process team.

Process Performance versus Process Maturity

Investigations such as *Škrinjar et al.* (*2008*) indicate that maturity level is positively related to process performance. Therefore we were interested in the level of process performance of the bank. Since quantitative data was not available, we followed the approach of van Looy (2015) and measured the bank's process performance perceived by the employees. On this basis, we hypothesize:

H1 The process maturity has a positive influence on the perceived process performance.

Should this hypothesis be confirmed, the result would support the findings that have been reported so far in the literature. Should the hypothesis be falsified, the existence of process maturity models would be seriously in question.

For the purpose of this investigation, a regression analysis was performed, which resulted in R^2=34.4%. The adjusted value was only slightly lower with 33.7%. Subsequently, a correlation test with a confidence level of 99% was performed. The Pearson correlation coefficient of the two variables was 0.586. This proves that the maturity level influenced the perceived process performance in our case study by 58.6%. Thereby the hypothesis is held to be supported.

The results for maturity level 2 are depicted in Fig. 2. As to be expected, it shows a broad scattering of the data. Low (high) assessment of process maturity results in a low (high) process performance. Correlation is given, though it is rather low. The figure shows the wide distribution of responses concerning maturity level 2.

The respective maturity level – in our case level 2 – thus has a positive influence on the process performance. But it has to be noted, that further factors such as organizational culture also influence the process performance (Grau and Moormann 2014). Those factors were not part of our analysis.

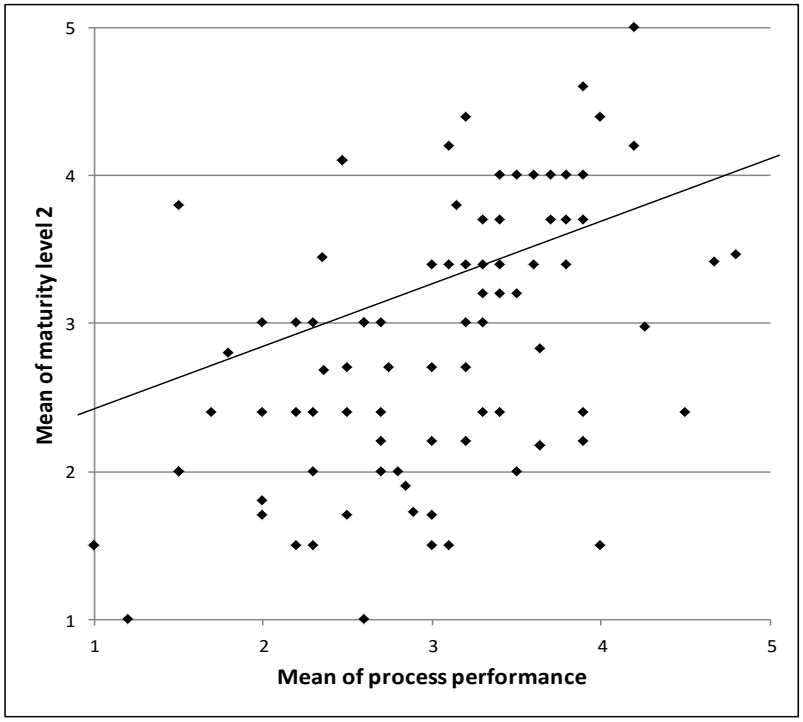

Fig. 2. Results of the regression analysis (maturity level 2)

Implications for Theory and Practice

Practice

The classification of the process maturity on level 2 implies that the processes in our case study are rather immature and unstable. Process management in the actual meaning is not installed and the whole understanding of process thinking is still in an early stage of development. Consequently, a considerable potential for improvement emerges. The management board should take on actions to raise the process maturity to a higher level and to increase the bank's process performance on that way.

Companies facing a similar situation like this bank should standardize their business processes, which would lead the company to level 3. Especially in the front-office area the processes are often conducted individually and the steps within the processes are fairly complex. A benchmarking of the processes with companies, which run a similar business model, could deliver further insights.

Our research project to measure process maturity drew attention to a number of other deficits. For instance, the understanding in many companies, what might constitute a 'process', is heterogeneous. For certain processes there is often no responsible person assigned. Moreover, in many cases there is a diffuse understanding, what is meant by improvement respectively innovation of processes. Especially in terms of digitalization of processes this is an aspect, which needs immediate clarification in companies.

Concerning the organizational structure, often a functional thinking in terms of departmental thinking ("silo thinking") exists, while process thinking is limited to the documentation of traditional routines. An understanding in terms of cross-departmental collaboration and end-to-end processes is still barely available. Measurement and, based on it, a monitoring of processes, is in many firms currently nonexistent. Thus, improvements are in most cases to be found, when something is already heating up ("fire fighting").

The determination of the process maturity level and the identification of weaknesses are usually seen as very favorable in the company. Because of the requirements given for each level, maturity models can serve as a compendium for the procedure of process improvement. Thereby maturity models help to spread process thinking in the firm, to define end-to-end processes, to fulfill legal requirements (in our case study the German Minimum Requirements for Risk Management [MaRisk], compliance etc.), and to adhere to company-internal standards.

The challenges in the practical application and the difficulties when interpreting the results should not be underestimated though. In addition, a survey like ours cannot replace a comprehensive evaluation, perhaps supported by a consulting company, which analyses each single process.

Theory

Experience shows that maturity models are helpful in order to grasp the current state of process management in organizations. Employees and managers can benefit from the results to initiate improvements and to generate the needed attention for process efficiency and -effectiveness (e.g., Kamprath, 2011). However, there are a number of aspects, which should be taken into consideration:

Lee and colleagues (2007) complain about the missing distinction between process- and process management maturity. In fact, models based on the CMMI approach often mix the maturity of processes with the maturity of the company with regard to the application of process management. It is possible that processes have been developed properly and are monitored etc., but maybe this level of maturity is not needed to develop business innovations.

Particularly in times of major changes disruptive innovations are much more important than continuous innovations. Therefore Lee and colleagues propose to put the primary focus on the maturity of the process management.

The large amount of available maturity models is another critical fact. Each model has its own characteristics (e.g., in relation to the application area, level of detail, and assessment method), and also each industry and each company have their own specifics. Thus the selection of a suitable model is extremely important.

Another issue is, whether a level model is reasonable at all. Do levels really work in an additive way? The results of our survey raise doubts, because the data spreads widely over all levels of the maturity model. Scholars also complain about huge jumps between the respective maturity levels. Kamprath (2009) criticizes, that maturity models rarely deliver precise recommendations for process improvements and for achieving higher levels. Though weak points in the processes and requirements might be identified, but proper suggestions for fulfilling the requirements are usually not given. For the OMG model, however, comprehensive guidelines are available.

Maturity models do not deliver any hints regarding the examination of a company's organizational structure. Because of its cross-departmental approach, process management interferes massively with the organizational structure. The long-term transition of a company from a function- towards a process-oriented organizational structure is even a core objective of modern process management. Maturity models do not provide any help in this regard.

A further concern is that process maturity measuring only deals with existing processes and their improvement needs. Thus process maturity models are based on the traditional process lifecycle (e.g., Dumas et al., 2013) like process identification, analysis, redesign, implementation, and monitoring. Hence, those models neglect the aspect of process innovation. However, disruption triggered by new technologies leads, at least in certain parts of the banking sector, to completely new processes (account opening via online identification, usage of robo-advisors etc.). Also the concept of capabilities (van Looy, 2014) is not completely satisfying. Though structural and cultural aspects are considered, disruptive process changes are a non-factor here.

Despite some disadvantages, from a theoretical view point the advantages still prevail. Maturity models allow the measurement of process maturity, help to sensitize in terms of business processes, and provide first recommendations for process improvements. The design principles for maturity models recommended by Pöppelbuß and Röglinger (2011) lead to further improvements of these models. Having said this, the application in our case study has also disclosed a number of methodical problems. Here it is up to academia, to contribute to advancement by studies and theoretical research.

Conclusion

Based on quantitative and qualitative data we could develop a realistic picture of the current business process maturity of the investigated bank. We identified a number of benefits of measuring a company's maturity level. However, we also found some substantial theoretical drawbacks, such as the lack of considering process innovation in the extant process maturity models. These deficits should be addressed in further academic research.

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