

A Process Management Perspective on Future ERP System Development in the Financial Service Sector

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Most organizations use Enterprise Resource Planning (ERP) systems, which provide a platform for integrating processes and data. Even though competitive pressure forces financial service organizations to permanently improve their business processes, there is a lack of research regarding the use of ERP systems within financial services. Focusing on the insurance sector, we are interested in current and potential process management issues with regard to ERP systems. We examine strategic IT trends by conducting semi-structured expert interviews with participants in IT-strategic decision making. We present current trends and identify two main issues: the IT-independent management of processes and the need to engage in service-oriented architecture (SOA). From a practitioners' view, the use of ERP systems has to be considered critically in the insurance sector. Further research on the identified issues has to take into account the sector-specific characteristics.

1. Introduction

Enterprise resource planning (ERP) systems provide a platform for integrating processes and data [10]. Most organizations use ERP systems, regardless of whether it is a manufacturing or service organization [7]. Only few articles are concerned with ERP systems in particular sectors and we are not aware of articles regarding ERP systems especially within the insurance sector (cf. [28, 1]). Research within the service sector reveals different applications of ERP systems compared to, for instance, the manufacturing sector [7]. Regarding information system activities, the observed sector may play an important role [9] and empirical research in the financial service sector is considered especially interesting [36].

A general issue of ERP systems implementation is the organizations' choice to customize systems or adapt to generic processes [19, 10]. Furthermore, competitive pressure forces financial service organizations to permanently improve their business processes [16]. Business process management (BPM) provides an established basis for process improvement. Researchers' and practitioners' interest in BPM has been increasing for decades, resulting in several standards [25] and process management maturity models [32]. A challenge for BPM with regard to ERP systems is providing a fit between the system and continuously changing business processes. Considering the increasing usage of ERP systems in the financial service sector and the need for continuous process improvement, we state the following research question:

How will current and potential process management issues evolve with regard to ERP systems in the financial service sector?

Due to the particularity of financial services as the most highly regulated sector [34], we focus on the insurance sector. We conducted 15 semi-structured expert interviews [12] with participants in IT-strategic decision making. The main contribution of our study is twofold. First, we present the current maturity of ERP systems and BPM in the examined organizations. The maturity assessment provides the basis for interpreting the results within the insurance sector and to identify gaps

and dependencies in the use of ERP systems and BPM. Second, to answer our research question, we provide current strategic IT trends and their impact on ERP systems and BPM, identifying current and potential management issues.

Section 2 provides the applied definitions of ERP systems and BPM and presents research and characteristics of the financial service sector. In Section 3, we present our research method and the study's context. Section 4 provides our findings. First, we present the organizations' maturity regarding ERP systems and BPM. Second, we provide the strategic IT trends in the examined organizations. In Section 5, we discuss our findings in the context of the insurance sector and provide the study's limitation and opportunities for further research. We conclude the article with a short overview of the main results and the contribution for practice and research.

2. Theoretical background

2.1. Derivation of applied definitions

Table 1 shows the definitions of ERP systems and BPM applied in our study. We used these definitions in order to provide a basic common understanding while avoiding limitations on specific aspects. We asked all participants for questions or comments regarding the definitions.

ERP systems are commercial software packages enabling data integration across an organization [15, 10]. Furthermore, ERP systems are defined as enterprise-wide (standard) software systems to integrate and optimize transactions and core business processes across several functions [1, 19]. Because standard ERP systems lack specific functions for the service sector [7], we explicitly broadened the definition of [19] to non-standardized, that is, individual ERP systems.

BPM is concerned with the efficient management of business processes and their continuous improvement [35], providing a set of structured methods and technologies [2]. Current research provides an extensive overview of several BPM standards across the phases of the BPM lifecycle [25] and several BPM maturity models exist to assess organizations' ma-

turities and provide guidance for their improvement [32]. Our applied definition focuses on the continuous improvement of processes across the BPM lifecycle [35] emphasizing the iterative and incremental approach to demarcate BPM from business process reengineering [25].

2.2. Related research in the financial service sector

Information systems activities and the use of ERP systems differ across sectors (cf. [9, 7]) as well as the requirements and skills regarding BPM [5]. Hence, within financial services, the sector specific characteristics have to be considered. Although there is much research regarding ERP systems (e.g., [1, 14]) and BPM (e.g., [25, 32]), research combining these topics in the financial service sector, especially in the insurance sector, is scarce.

Insurance companies are highly information-intensive [3] underlying several regulations [6]. An issue regarding BPM in service organizations is the difficulty to precisely define the deliverance of the service which poses a challenge on ERP implementation as well [7]. Depending on the provided products' complexity, extensive training is necessary to explain the products to the customer [6]. According to the framework of [22], we consider insurance services as expert services with a high customer interaction and a high number of configurational choices, which additionally impede service (process) definition.

Highly regulated sectors face the challenge of providing transparency through reporting [30, 24]. The financial service sector, as the most highly regulated industry [34], with a continuing trend towards increasing regulation [4], has to conform to several directives posing additional requirements on information systems [23]. Furthermore, financial service organizations have numerous legal partners and need detailed information for operative and strategic operations [7]. Regarding insurance organizations, for instance, the directive 'Solvency II', likely coming into effect in 2014, demands increased transparency to guard insurance organizations and their customers against various economic risks [11]. Thus, insurance providers will face new requirements to deliver necessary reports and already prepare for the upcoming requirements (e.g., [20]).

To assess the future development of ERP systems from a process management perspective, we first need a basis to assess the current maturity of ERP systems and BPM in the insurance sector. The sector-specific maturity assessment is necessary since – for instance, regarding BPM – different sectors are at different maturity levels [5]. Based on the current situation of an organization and its specific capabilities, maturity models help to guide necessary improvements to arrive at a mature state or maturity level, respectively (cf. [32]). Our approach to maturity assessment is described in Section 4.1.

ERP system	An enterprise resource planning system is an integrated software for supporting main processes and important administrative functions in an organization.
BPM	Business process management is concerned with the iterative and incremental optimization of business processes. The optimization of business processes is represented in a continuous lifecycle. The lifecycle encompasses the process analysis or diagnosis, process design, process enactment, and continuous control.

Table 1. Applied definitions

3. Research Approach

We conducted 15 semi-structured expert interviews [12] between September 2011 and January 2012 to understand the IT-strategic challenges within the examined organizations. We applied this interview technique for posing open questions and following up on new aspects [26].

We structured the interview guideline into four main sections regarding: 1) the developments and IT trends in the organizations and in the service sector in general; 2) the usage of ERP systems; and the maturity and application of 3) BPM and 4) data quality management within the organizations. The guideline was reviewed by researchers and practitioners and we conducted two test interviews.

The 15 interviewees stem from twelve insurance providers and two other insurance-related organizations. For the analysis with regard to the organizations' ERP systems and BPM, we focus on the 12 insurance providers. For the analysis of IT trends, we consider all participants. The insurance providers are presented in Table 2 ordered by their premium income and number of employees. We chose the participants with respect to their influence on potential IT trends in the respective organizations. Whenever possible, we conducted the interviews with CIOs/Heads of IT, since they are the main drivers for IT innovations [8]. Most participants are heads of IT departments or belong to middle or executive management. Of the participants involved, 13 of 15 are involved in IT-strategy decision making as decision makers or direct advisors (Table 2). All participants are experienced, with a minimum job experience in the financial service sector of 11 years and a mean of 19.8 years. We recorded and transcribed the interviews and returned them to the participants for communicative validation [12] resulting in minor wording adjustments.

Organizations' premium income in millions Euro		Organizations' no. of employees	
< 1000	4	< 1000	4
1000–5000	4	1000–5000	4
5001–10000	2	5001–10000	2
> 10000	2	> 10000	2
Total	12		12
Participants' position regarding IT-strategic decision making			
CIO/Head of IT (national)		5	
Directly reporting to CIO/Head of IT (international)		3	
Directly reporting to CIO/Head of IT (national)		4	
Other executive board members		1	
Other participants from insurance sector		2	
Total		15	

Table 2. Examined organizations and participants

We analyzed the interviews with regard to our research question by iterative descriptive and interpretive coding [29]. Statements regarding, for instance, IT trends, applied definitions, and maturities, were categorized accordingly. We applied a software tool [21] especially for meaning condensation and interpretation of statements [26]. According to the interview's structure, we asked the participants about general and sector-specific developments and IT trends. We coded the IT trends based on IT trends derived from current studies (e.g., [8, 31]) and further IT related strategic developments that were addressed by participants. More than one code could be attached to a statement to identify duplicates of and interdependencies between IT trends. The statements regarding the use of ERP systems and BPM within the respective organizations were coded based on the maturity levels (cf. Section 4). The question on the ERP systems considered the system's current and future development. The questions on BPM considered the current and future application of BPM across the lifecycle (cf. Table 1). Furthermore, we asked about the interdependencies of ERP systems and BPM.

4. Findings

4.1. Maturity of ERP systems and BPM in the examined organizations

In this section, we provide an overview of the examined organizations' maturity regarding the ERP system and BPM in order to interpret our further results within the given sector and organizational context.

4.1.1 ERP maturity. We assessed the maturity of the ERP systems based on their implementation stage. We focused on the integrated support of administrative and service-specific functions, since service organizations' standardized ERP systems lack the support of service-specific functions and instead focus on administrative functions, for instance, finances and human resources [7]. To keep the categorization simple and generalizable across standard and individual products, we defined four maturity levels, presented in Appendix A.

Of the examined insurance providers, 10 of 12 rely on standard ERP systems (Figure 1). All organizations at maturity level 2 are currently integrating different ERP systems across organizational sites due to mergers and acquisitions (M&A). In these organizations, a standard ERP system was already implemented at least at one site. Regarding these organizations, the maturity can be interpreted as an indicator for the still-necessary activities towards an integrated organization-wide platform rather than a statement about the actual quality of the ERP systems within the different organizational sites. The organizations with integrated administrative support (e.g., accounting) and insurance-specific functions (e.g., product development, claims processing) – and therefore at maturity level 4 – had to

integrate standard ERP systems with other existing systems. In one case, the system had to be highly customized, entailing increased maintenance.

Two organizations used individual ERP systems. In one organization, the existing individual system is considered up-to-date. The other organization with an individual ERP system is on the brink of implementing a standard ERP system for resource management. The pros and cons of the implementation of standard ERP systems are presented in Section 4.2.3.

In 10 cases, the existing ERP systems are currently enhanced or the participants think it necessary to further develop the systems. However, only in one further organization, the sustainability of the existing ERP system is questioned.

4.1.2 BPM maturity. We assessed the organizations' BPM maturity, applying the BPM Maturity Model [33] and the according maturity levels (Appendix A) because it focuses on BPM as a holistic management practice [32]. Since the BPM maturity encompasses several capability areas, it is possible that organizations show different development across capabilities. Therefore, organizations' BPM maturity could be assigned between two levels if the maturities of capability areas differ.

All organizations are beyond the documentation of first processes (Figure 2). In the organizations at Level 1-2, processes are partially documented, but process adjustments are caused by, for instance, IT projects, and not conducted in a process-driven manner. Besides modeling processes, organizations at Level 3 rely on process improvements based on employees' suggestions or utilize centralized know-how for process improvement. However, the initiatives are rather sporadic and the organizations lack controlling methods to measure im-

provements. The seven organizations on higher maturity levels derive measures and control process improvements. For instance, the organization at Level 5 continuously controls the process lifecycle by applying process release management.

4.1.3 Interdependencies between ERP systems and BPM. Implementing a standard ERP system has process implications and it is recommended to adapt to standards [19, 10]. This is corroborated by the participants. With the exception of one organization in which the ERP system was highly customized to be adaptable to different sites, the organizations stick to given standard processes and avoid customizing. Comparing the maturities for each organization (Appendix B) shows that ERP system and BPM maturities tend to correspond. However, the impact of standard ERP systems on BPM and business processes should not be overrated since standard ERP systems are implemented to support administrative functions. Three participants from different organizations at different ERP maturity levels (2 and 4) emphasized that process assessment and improvement mainly aim at other systems with service-specific functions or processes. Furthermore, processes that are not supported by IT should be considered for improvement and additional IT support.

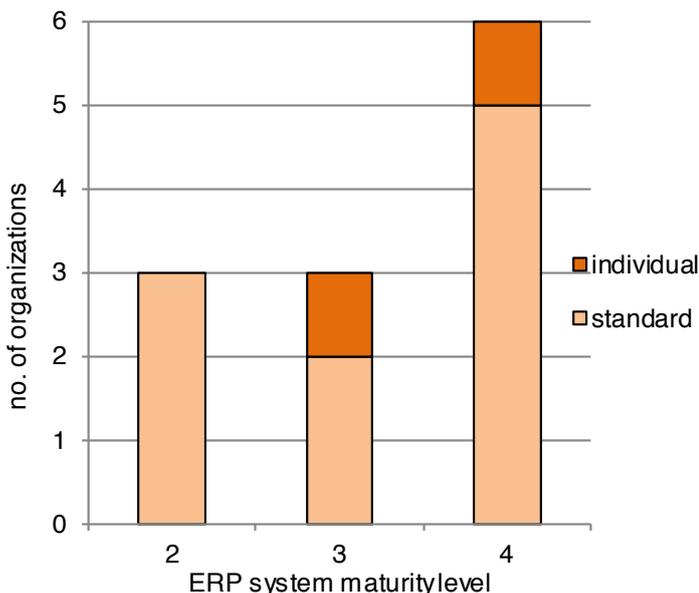


Figure 1. ERP system maturity of the examined insurance providers

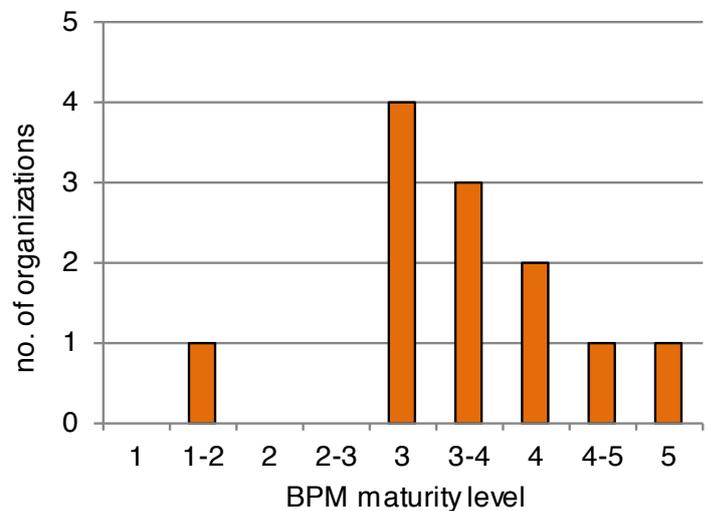


Figure 2. BPM maturity of insurance providers

4.2. IT trends in the financial service sector

4.2.1 IT trends overview. We identified five prominent IT trends and their interdependencies within our study's context. In this article, we focus on the four IT trends related to BPM, omitting the data analysis trend, which is addressed in [13]. A list of the remaining IT trends and the number of supporting statements is provided in Appendix C. Most of the trends are mentioned by the participants without further explanation, for instance, within an enumeration of trends. The

relevant trends are provided in Figure 3 including the number of participants who addressed and supported them. Other IT trends, for instance cloud computing, were not considered relevant by the participants. Cloud computing was addressed by five participants. Three of them explicitly demarcated cloud computing from relevant trends. The other two participants emphasized the need for private clouds, however questioning if their applied solutions really are cloud computing.

Of the participants, 13 of 15 addressed the trend of integrating standard and individual systems and 12 participants addressed the trend towards standardized systems. The need for this integration results from the increasing orientation towards standardized systems and the high rate of individual software in the financial service sector. Considering the statements linking system standardization with ERP systems, the standardization trend is not limited to ERP systems. The need for integrating different software systems gives rise to the demand for modularized systems and service oriented architecture (SOA), respectively. Apart from system integration, SOA is referred to in combination with process automation to provide the possibility for defining service processes that can be combined independently. Additionally, standardized systems are referred to as a means of supporting process standardization and automation. The participants see BPM as important in order to analyze and optimize processes prior to automation to prevent the automation of poor or flawed processes. Similarly, BPM is considered important for analyzing processes and identifying service processes for modularization and integration across different systems.

4.2.2 Integration of standard and individual software. The integration of standard and individual software is the primary topic within the examined organizations. Due to the lack of support for main business processes in the insurance sector, standard ERP systems may play a rather negligible role being applied for basic resource management. Even if they are used for comprehensive resource management, organizations applied other systems to support insurance-specific processes. Besides the necessity to integrate the organizations' internal IT landscape, external systems have to be integrated as well. The IT landscape has to be aligned to the changing organizational conditions. In this context, seven participants address M&A and at the time of the study, five of the examined organizations dealt with system integration due to M&A.

Regardless of the application of individual software, it is necessary to integrate standard systems because the organizations apply different standard software for different functional areas. In addition, integration is necessary to provide a system-independent availability of processes and data.

Due to the shortcomings of standard ERP systems in supporting service-specific processes, there is much individual development compared to the administrative functions. The replacement of existing individual systems with standard soft-

ware is not possible or not desirable, leading to a coexistence of standard and individual software.

4.2.3 System standardization. The trend towards the application of standard software has to be examined critically. Within the service sector and our examined organizations, mostly

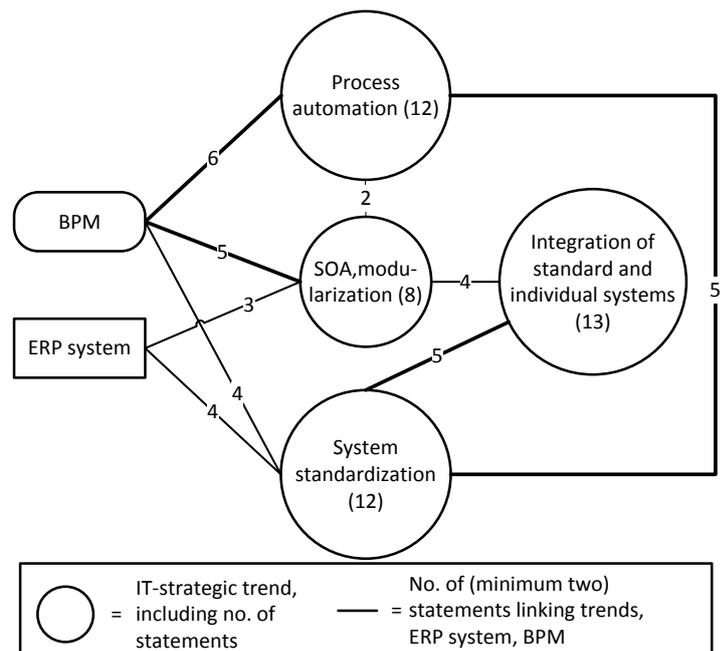


Figure 3. Identified IT trends and interdependencies

standard ERP systems are used (Figure 1) and one of the organizations with the individual ERP system currently implements a standardized solution for its resource planning. Complementary, additional standardized and individual systems are applied. In the context of our study, the trend towards standardization is closely linked to ERP systems. We explicitly asked for the strategic goals for the implementation of their respective ERP systems. Hence, we consider reasons for implementing standard and individual ERP systems in the following.

The main reason was standardization within an organizational group (Figure 4), where standard ERP systems have a consolidating impact. Considering the functional areas that should be supported within the examined organizations, accounting is ranked first. More detailed inquiries showed that the systems were also applied for managing further resources, that is, material, time, and employees. Standardizing accounting was in all cases mentioned in combination with standardization within an organizational group. Process standardization as a strategic goal was also mentioned in two of three cases along with standardization within an organizational group. Another strategic goal was the support of controlling by ERP systems. Regarding the sustainability of standard ERP systems,

the vendors are expected to provide regular maintenance and updates, including the system's further development to fulfill sector-specific requirements. This overlaps with the reduced maintenance effort from a customer perspective. The efficient maintenance is related to standardization within an organizational group as well.

The trend towards standardization is limited. Regarding individual ERP systems, their focus was on insurance-specific functions. Participants emphasized the support of organization-specific functions, for instance, the mapping of organization-specific processes and products. Due to the products' complexity, integration into a standard ERP system is not considered possible and flexibility for product development should be maintained. Whereas standard ERP systems were applied for administrative functions, the question remains to what extent insurance-specific functions were supported by standard or individual software.

Aside from organizations that systematically apply individual systems to support organization-specific functions, other organizations simply lack alternatives to replace existing individual systems. The challenge for the standardization of insurance-specific functions is the heterogeneity in the insurance sector, especially concerning the complex product development and distribution channels. There seems to be a lack of well-proven standard systems that can be applied across the organizations within the insurance sector. The standardization of processes and products poses the threat of losing competitive edge.

4.2.4 Process automation. Participants considered the automation of processes with regard to the improvement of core business processes, that is, processes that do not follow standards and therefore cannot be mapped on standard software. Process automation is closely related with BPM because it is necessary to (re)design processes before automation to gain sought advantages. A sophisticated process management approach is necessary to define, model, and map processes for automated execution. Furthermore, the processes have to be monitored continuously. In addition, participants considered data quality important for process automation.

4.2.5 Service-oriented architecture (SOA). SOA is no new trend, however, due to our qualitative approach, we are able to examine the underlying issues and solutions organizations are considering. The trend towards SOA affects the IT landscape and business processes. With regard to the challenge of adapting ERP systems to changing business processes, SOA provides a possibility to improve ERP systems' flexibility and to reuse processes.

Based on an existing IT and process landscape, participants emphasized service orientation for system integration and the gradual modularization of existing processes. The application of modularized processes has the advantage of the redundancy-free provision of processes to several user groups. The

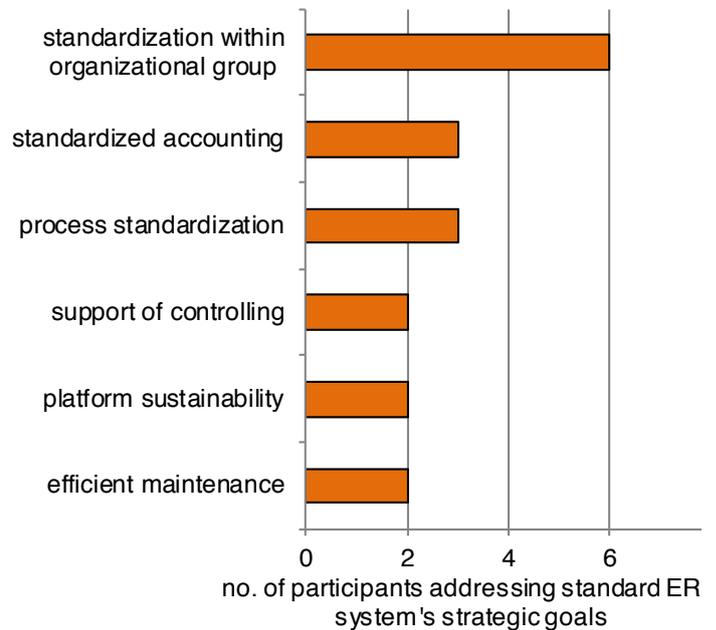


Figure 4. Strategic goals of standard ERP system implementation

possibility of reusing processes has a positive impact on the service provided to user groups. Furthermore, it supports the application of multi-channel distribution. Processes should be reused and provided internally and externally, for instance to sales staff and end customers. Furthermore, two participants considered SOA important for process automation since defined services can be combined flexibly to different processes. Because of the reuse of processes, format and media discontinuity and manual rework can be avoided.

5. Discussion

5.1. ERP systems and BPM in the insurance sector

5.1.1 Maturity within the insurance sector. The ERP maturities (Figure 1) indicate that insurance organizations are able to integrate ERP systems in the IT landscape. Nevertheless, we did not encounter a full integration (cf. [7]) based on standard ERP systems. Hence, we corroborate the lack of integration and the resulting lack of benefits for the insurance sector.

Considering the BPM maturities (Figure 2), almost all examined organizations are at advanced levels. This is interesting regarding the highly information-intensive [3] sector and the difficulty to precisely define the deliverance of the service [7]. Although processes might not be defined on a detailed level, it is possible to derive performance measures.

The interdependency between ERP systems and BPM in the insurance sector, from our participants view, is rather weak due to the predominant use of ERP systems for administrative functions. However, since both maturities within one organization

tend to correspond (Appendix B), efforts in BPM might have a positive impact on ERP systems and vice versa; even if ERP systems are used for administrative functions and process improvements aim at other processes. Further research is necessary to understand to what extent, for instance, efforts in BPM increase process awareness resulting in improved ERP system usage or using ERP systems for administrative processes enables organizations to improve or focus on BPM.

5.1.2 Considerations for the insurance sector. The partial integration of ERP systems as a “basic accounting tool” in insurance organizations might be an “unnecessary and costly investment” (cf. [7, p. 214]). We argue that the benefit of ERP systems in financial services has to be further examined in the light of the currently increasing regulations and upcoming trends.

Regarding BPM, especially process automation is a challenging trend for insurance organizations. Due to the expert services and the resulting high customer interaction [6], process automation has to take into account several distribution channels as well as customers and employees. The latter includes the sales force, which has an important role for insurance organizations [6].

5.2. IT trends and resulting management issues

With respect to our research question, we see two main issues for insurance organizations: the need to manage processes IT-independently and the need to engage in SOA.

5.2.1 Manage processes IT-independently. The integration of processes is necessary for system integration. Processes have to be managed IT-independently to allow continuous adaptation to changing IT-landscapes. Especially with respect to M&A, the main challenge is to align the continuously changing organization and IT landscape with the organizations’ processes. Standard ERP systems are applied to consolidate processes within administrative functions. These findings are corroborated by the use of standard ERP systems in banking and service organizations in general [5, 7]. Due to the trend towards standardization, standard ERP systems will gain increased importance for administrative functions. Since standard ERP systems are by now technically robust [27], their application may be a competitive necessity. In contrast, organization-specific core business processes are still beyond the scope of standardized ERP systems within the insurance sector. Hence, despite the increasing importance of ERP systems, the IT-independent management of processes is necessary to capture all relevant processes in the insurance sector. Processes should be identified systematically and organizationally-driven to avoid suboptimal improvement, that is, improving single systems instead of business processes. Organizations need to examine, to what extent existing IT is capable of supporting these processes, including processes that might be not supported by IT, yet.

5.2.2 Engage in SOA. To support business processes sustainably with IT, the examined organizations coping with the integration of standard and individual software engage in SOA. In this context, the trend towards system integration is a driver for SOA, and IT-independent process management is a prerequisite. In this context, SOA might support the alignment of information systems, which is critical to achieve the intended organizational objectives, especially after M&A [17]. We see the need for organizations and vendors to engage in SOA to provide the flexibility for this alignment regarding individual as well as standard systems. Hence, we corroborate the current need for further research in SOA from a BPM perspective [37].

The examined organizations only standardize systems and processes to improve efficiency and if no organization-specific differentiation relevant for competition is lost. The standardization within insurance-specific functions is associated by a loss of flexibility, especially concerning product development and maintenance of existing products and insurance policies. Modularization simplifies the implementation and integration of standardized systems, reducing individual systems to necessary organization-specific core services. However, the examined organizations approach SOA carefully as it has to be conducted with regard to IT and process issues. SOA supports process automation regarding the need to manage administrative and core business processes conjointly and across several user groups. Especially automation of core business processes promises more efficient processes while maintaining organization-specific processes and thus entails a competitive advantage.

SOA addresses several issues [38] that turn out relevant in the examined insurance organizations: That is, the reuse of services, for instance within processes that are accessible for different stakeholders, monitoring and improvement of processes, especially in conjunction with BPM, and increasing flexibility in service and functionality provision while standardizing processes. ERP system vendors should aim for system modularization in order to gain appeal in the service sector, especially since holistic standardized support of functions is not possible due to the complexity and heterogeneity of the sector. Although SOA will have a high impact on the ERP market [1], the impact on insurance-specific processes and therefore organization-specific processes should not be overrated due to the current standard ERP systems’ utilization for administrative functions.

Current literature provides a SOA maturity model for assessing SOA approaches – from rather IT-related to business and service driven approaches [38, 18]. Especially from a BPM perspective, the maturity model might be an adequate approach to assess and support service organizations’ that engage in SOA.

5.3. Limitations and further research

Our results are relevant for the majority of organizations in the insurance sector, since most organizations use ERP systems. Nevertheless, our study has the following limitations: Due to the number and selection of organizations and participants, the generalization of our results is limited. The particularity of the financial service and especially insurance sector [6] further limits generalizability to other sectors. When aiming for a detailed maturity assessment, the criteria may have to be adjusted for small- and medium-sized organizations, in which operative requirements can be addressed at the executive board level without the necessity for a dedicated BPM team. There are several ways to arrive at a high process management maturity level [32].

Further research will examine the role of data quality management and its interdependency with BPM. In this context, we expect the regulations of the insurance sector to influence the management issues with regard to ERP systems. Additionally, further research should examine the maturities across sectors. For instance, several case studies exist on BPM but BPM maturity assessments for sectors are scarce. In this context, interdependencies between maturity frameworks and assessments might provide further insight into process orientation and IT and business alignment in service organizations.

6. Conclusion

We assessed the ERP system and BPM maturities within the insurance sector. Furthermore, we identified IT trends and related current and potential process management issues with regard to ERP systems. The identified trends may be familiar. The results are, however, very interesting since assumed trends, like cloud computing, seem not that relevant within this specific sector. Considering the process and IT alignment, ERP systems are applied to standardize functions across organizations. While this standardization focuses on administrative functions, process improvement and automation focus on core business processes. Therefore, organizations should engage in SOA for a holistic process and IT alignment.

Our study contributes to currently evolving research in ERP systems, BPM and SOA within the insurance sector, additionally emphasizing the need to consider sector-specific characteristics in IS research. Furthermore, we provide research opportunities for maturity assessments within the service sector.

The practical contribution of our study addresses users and vendors of ERP systems. Vendors have to consider sector-specific issues as well and provide modularized systems to facilitate system integration.

Potential ERP system adopters should assess the benefit of current standardized ERP systems critically and based on the organization-specific processes, not vice versa. Practitioners

aiming at improving processes for competitive advantage should be aware of the necessity to manage processes IT-independent. This is a prerequisite for SOA, especially when applying individual systems.

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Appendix A – Maturity levels (excerpt)

ERP system maturity levels	
1	No ERP system available
2	Support of administrative functions, low integration, different non-integrated ERP systems
3	Integrated support of administrative functions
4	Support of administrative and insurance specific functions
BPM maturity levels	
1: Initial	None or very uncoordinated and unstructured (ad-hoc) attempts; mostly reacting to acute issues, often requiring significant rollback and rework; high level of manual interventions and workarounds; minimal employee involvement, low reliance on external BPM expertise.
2: Repeatable	Limited documentation of processes, standards and practices; first attempts with structured methodology and common standards, varying across different lines of business; increased involvement of top management; extensive use of simple process modeling.

3: Defined	Focus on management of early phases of process lifecycle; use of elaborate tools, combination of different process management methods and tools, more extensive use of technology for delivery and communication of BPM.
4: Managed	Structured team that maintains standards; exploration of process controlling methods and technologies; formal process management positions; widely accepted methods and technologies; continuous extension and consolidation of process management initiatives and process orientation.
5: Optimized	Governance framework is in place; process management/data quality management is a part of managers' activities, accountabilities and performance measurements; wide acceptance and use of standard methods and technologies; approach to BPM incorporates customers, suppliers, distributors and other stakeholders; established business process lifecycle management; process management becomes the way business is done.

Appendix B – Comparison of maturity levels

Organization	BPM level	ERP level
#1	1,5	2
#2	3	3
#3	3	4
#4	3	4
#5	3	2
#6	3,5	2
#7	3,5	4
#8	3,5	4
#9	4	4
#10	4	3
#11	4,5	3
#12	5	4

Appendix C – Other mentioned IT trends and number of supporting statements

Data analysis (8); mobile applications (including Tablets, Smartphones) (4); online portals (2); IT outsourcing (3); cloud computing (2); digitalization and paperless office (2); green IT (1); social analytics (2); social communications and collaboration (1)

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