



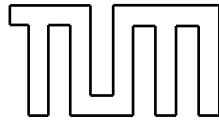
FAKULTÄT FÜR INFORMATIK
DER TECHNISCHEN UNIVERSITÄT MÜNCHEN

**Conceptualizing Organizational Transformations of
IT-Management Accounting in State-owned
Enterprises**

Christoph Rudolf Ertl

Vollständiger Abdruck der von der Fakultät für Informatik der Technischen Universität München zur Erlangung des akademischen Grades eines Doktors der Naturwissenschaften (Dr. rer. nat.) genehmigten Dissertation.





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Lehrstuhl für Wirtschaftsinformatik
Univ.-Prof. Dr. Helmut Krcmar

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Christoph Ertl

Abstract

Motivation:

In recent years, the importance of state-owned enterprises (SOEs) has continuously increased. Many SOE originate from the 1980s and 1990s. Now they are facing a new stage in their company life cycle. Organizational transformations in SOEs are becoming a frequent phenomenon, especially in IT departments of SOEs, caused by either growing initiatives of public private partnerships in the IT sector or the realization of classical IT outsourcing activities. However, SOEs often fail to align their management accounting system with the newly established business structures. We assume that this results from a gap in existing research, which focuses on private enterprises and public administrations. Characteristics of SOEs are not considered in current theories and frameworks. Thus, a new framework needs to be evolved that encompasses major characteristics affecting IT management accounting of SOEs: (1) dynamic processes, which arise from the variable time horizon of managers' decisions, (2) complexity of the decision process by integrating various stakeholders, (3) detailed representation of management accounting processes to deal with bureaucratic constraints, and (4) consideration of public employees' attitude. This doctoral thesis addresses the gap of a missing artifact to manage organizational transformations of IT management accounting in SOEs by integrating their four distinct characteristics into a new framework.

Research Approach:

This doctoral thesis employs a qualitative research approach to develop a framework for SOEs mentioned above. We reviewed relevant theoretical and empirical literature to verify major characteristics of SOEs. Then we explored existing theories and frameworks for analyzing organizational transformations. By performing a requirement based evaluation of existing concepts we finally derived three frameworks that can be applied in the SOE domain. These three frameworks were integrated applying the punctuated equilibrium model of change. The new SOE framework was applied to a case study to analyze the transformation process of the IT management accounting department systematically. This reveals success factors as well as transformation barriers from empirical interview data and supplementary data such as organization charts, business reports and service descriptions.

Results:

The publications of this thesis offer in-depth insight into IT management accounting in SOEs. We analyzed existing literature regarding the characteristic of different organizational forms and identified four distinct characteristics affecting management accounting in SOEs. We evaluated existing frameworks on organizational transformations in IT management accounting in terms of their basic change theory based on their unit and mode of change. We integrated existing frameworks and evolved a new framework which enables to conceptualize management accounting changes in SOEs. We determine success factors as well as transformation barriers by applying the SOE framework to the case study.

Contribution:

This doctoral thesis gives several contributions to theory and practice. We enhance public sector research by identifying four delimiting characteristics regarding IT management accounting in SOEs. We extend institutional theory by adding the stakeholder and the public employee perspective to the existing elements. We provide empirical success factors and transformations

barriers based on the application of the SOE framework. This will also help practitioners, to identify and understand those factors, which influence or will influence their change process. Thus, they can actively shape the organizational transformation in the IT management accounting department according to their management requirements. By validation based on further empirical cases, this framework can be used to identify additional recommendations for other SOEs, e.g. the health sector or in public utility companies.

Limitations:

The publications presented within this doctoral thesis are subject to certain limitations. The publications of this thesis have been written over a period of five years. During this time, our personal understanding of the subject under study evolved as well in respect to the terminology, characteristics, frameworks and theories used. We focused on IT departments of German airports as representatives of SOEs. Thus, the data stems from a limited number of organizations and the reviewed interview and documentary data is confined. The final evolved framework needs further empirical application to ensure generalizability.

Future Work:

This doctoral thesis creates the basis for new questions and further research. Upcoming contributions can use this result to argue on the four specific requirements of IT management accounting in SOEs compared to private enterprises and public administrations. These characteristics can be considered not only from an organizational transformation perspective but also from an implementation perspective on management accounting. How do these four characteristics affect the adaptation of management accounting in SOEs? Future research could also identify additional success factors and transformation barriers applying the SOE framework to case studies in other public sectors, e.g. to the health or the energy sector. This may give additional insights into management accounting to complement the SOE framework.

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List of Abbreviations

SOE	State-owned enterprise
MA	Management accounting
OC	Organizational change
OT	Organizational transformation
FW	Framework
IT	Information and telecommunication
PEM	Punctuated equilibrium model

PART A

1 INTRODUCTION

The thesis will integrate the specific characteristics of SOEs regarding IT management accounting into a new framework to conceptualize the organizational transformation process. The SOE framework evolved in this thesis fills existing gaps in organizational change research (see chapter 1.2). The following chapter motivates this doctoral thesis and provides detailed problem statements for the three research questions, which guided this research project.

1.1 Motivation

Organizational transformations caused by reorganizing business structures are a frequent event, which often additionally result in a change of the system. This applies not only to private enterprises, but also to state-owned enterprises (SOEs) (Uhlenbruck et al., 2003). Until now, considerable research has been conducted to analyze reasons for organizational transformations and to design an ideal management accounting system (Van de Ven & Poole, 1995). Furthermore, researchers developed new management accounting techniques to support incremental changes, for example Venkantraman's Organizational Change Configuration or management change programs like Kaizen and Total Quality Management (Joseph, 2006).

Thus, many initiatives adapting the management accounting system to changed organizational structures fail in practice, because they do not consider the broader organizational environment in which they must be integrated (Dillard et al., 2004). Considering the entire corporate environment during management accounting change is essential, because complex and ongoing relationships exist between actions, organizational routines and institutions, which shape the process of management accounting (Burns & Scapens, 2000; Bacharach et al., 1996).

To face the challenge of successful management accounting adaptation to changing business structures, researchers began to develop specified organizational transformation frameworks to enhance the understanding of organizational transformations and their impact on management accounting systems. However, these frameworks concentrate on private enterprises, e.g. from the electricity, manufacturing or bank sectors, as well as public administrations. Frameworks which consider organizational transformations and their impact on management accounting systems in SOEs are missing (Fryer, et al., 2009).

Also, little research has been done on how these frameworks can be applied to cases of SOEs (Fryer et al., 2009), although they contribute to global economy to a significant extent (Kowalski et al., 2013). Some indications why the assignment of existing organizational transformation frameworks, designed for private enterprises and public administrations, does not work properly with SOEs are their substantially shorter experience in the management accounting discipline as well as specific organizational characteristics. However, organizational transformations, especially in IT departments of SOEs, is noticeable increasing. These transformations are caused by either growing initiatives of public private partnerships in the IT sector (Sharma, 2012; Da Cruz & Marques, 2012), the realization of classical IT outsourcing activities (Joha & Janssen, 2010; Cordella & Willcocks, 2012) or the upcoming trend of IT insourcing in the public sector (Damanpour et al., 2013; Warner & Hefetz, 2012). Those again entail changes in the management accounting system to meet with planning and monitoring requirements of the new organizational structure. The existing lack of an appropriate framework

to support the alignment of the management accounting system increases the complexity of transformation projects in SOEs.

This short introduction of existing research on the topic of organizational transformation shows that SOEs need a specified solution for conceptualizing their change of the management accounting system. This doctoral thesis will to give researcher a valuable artefact to analyze success factors and transformation barriers of organizational transformations in SOEs and enable practitioners to actively shape an efficient transformation process. Overall, this doctoral thesis intends to address the herein mentioned issues with the following research objective:

To explore the distinct characteristics of SOEs regarding IT management accounting and integrate these into a new organizational transformation framework.

To achieve this overall research objective the following sub-objectives are formulated:

1. Identify characteristics which distinctly differentiate IT management accounting of SOEs from private enterprises and public administrations.
2. Explore existing frameworks on organizational transformations and evaluate their qualification for being applied in the SOE-domain.
3. Evolve a framework for organizational transformations of IT management accounting that accounts for the specific characteristics of SOEs.
4. Determine success factors and transformations barriers in the context of management accounting transformations in SOEs.

This cumulative doctoral thesis consists of the following two parts: Part A consists of five chapters. The first chapter motivates this research, outlines the problem statement, defines the research questions and introduces the publications that make up this thesis. The second chapter evinces differences between three organizational forms regarding IT management accounting organizations and provides the conceptual background of this thesis by defining the main terms within the scope of this thesis. The third chapter gives an overview of the overall research strategy and describes the applied research methods. Chapter four discusses the findings of the publications presented in Part B. After a short summary of findings, the implications, limitations and further research opportunities are constituted. Chapter five concludes Part A of this thesis. Part B comprises the six peer-reviewed publications that were published in the context of this thesis.

1.2 Problem Statements and Research Questions

In this section, each of the three research questions of this thesis is motivated by a problem statement.

Problem statement 1: The characteristics and the depending requirements on IT management accounting in SOEs are not clearly defined.

In the private sector, IT management accounting is already used for many years and has a long tradition as a decision-making instrument (Johnson, 1983). In the past, many initiatives tried to transfer management accounting concepts used in the private sector to public administrations (Meier & O'Toole, 2011; Diefenbach, 2009).

However, many public administrations failed to implement and use these concepts successfully. Determining factors in the public sector, like the political influence or the departmental principle, are reasons for this failure. Over recent years, IT management accounting has also been implemented in SOEs. However, SOEs still face big challenges regarding the usage of IT-PM, when arranging internal accounting methods with the legal requirements in a regulated market environment (De Lancer Julnes & Holzer, 2001).

So far, the literature differentiates between private organizations and public administrations, when considering the organizational effects on IT management accounting. SOEs are not taken into consideration. Further, almost no research is done on how the characteristics of the three organizational forms affect the way IT management accounting is implemented and used. A differentiation between public administrations and SOEs is rarely made. This leads to the formulation of the following research question:

What are the characteristics that distinctly differentiate IT management accounting of SOEs from private enterprises and public administrations? (RQ#1)

Problem statement 2: No framework exists considering all characteristics and requirements of IT management accounting in SOEs.

As SOEs exist for several years now, an increasing number of reorganization efforts can be seen. Especially in the field of IT, there is a trend to outsource parts of or the whole IT department. Considerable research has been conducted to analyze the reasons for change in organizations in general and, in particular, in the management accounting department (Van de Ven & Poole, 1995). But this research has its focus on management accounting units in private enterprises and public administrations. A literature review with peer-reviewed management accounting and public management journals has shown that there is a gap in organizational change theories (Figure 1).

There have been some case studies about organizational change in SOEs but there are no models or frameworks that can describe and analyze this process. The characteristics of SOEs and their implication as described above have not previously been considered in the development of a theory of organizational change in management accounting. Thus, existing frameworks on organizational transformations must be explored and evaluated regarding their qualification for application in the SOE-domain.

Focus: Management Accounting / Performance Management	Case Studies about Organizational Change with respect to the focus	Theories about Organizational Change with respect to the focus
Public Administration (e.g. Health, Police, State,..)	18 Case Studies	3 Theories
State-owned Enterprises (e.g. Transportation,...)	6 Case Studies	–
Private Enterprises (e.g. Energy, Bank, Consulting,...)	17 Case Studies	8 Theories
Not specified		7 Theories

Figure 1: Research gap determined by the literature review

Due to the comparatively short history of SOEs, implementation and use of management accounting in general and particularly in the IT department has not the same maturity as in other organizational forms. Thus, researchers have not evolved a framework considering the characteristics and requirements of SOEs. However, because of the significant shorter experience in the management accounting discipline and their distinct organizational characteristic, SOEs need a framework that supports their organizational change process and enables the analyses of prior transformation projects. This would endow managers of SOEs to execute expedient and sustainable changes in their IT management accounting department in the case of reorganizing business structures. The above-mentioned challenges lead to the following research question:

Which elements does an organizational transformation framework need to be applied in the SOEs' domain? (RQ#2)

Problem statement 3: There are no contextualized recommendations for researchers and practitioners, when further evolving management accounting of SOEs.

Based on the missing differentiated view on management accounting of SOEs, that are either seen as part of public administrations or as minor representative of private enterprises, there are no guidelines for researchers or practitioners to conceptualize those transformations. This condition in research induces a higher risk of an insufficient organizational transformation project (Fryer et al., 2009). To close this theoretical and practical gap, this doctoral thesis intends to deliver empiric and context-specific suggestions for IT management accounting transformations in SOEs.

This will include success factors, which increase the chance of a successful transformation, as well as transformation barriers that should be avoided by the responsible change participants. Thus, the third research question is:

Which further success factors and transformation barriers can be identified in the domain of IT management accounting of SOEs? (RQ#3)

1.3 Publications included in the Dissertation

This doctoral thesis consists of six publications, which aim to answer the research questions (see Table 1). All publications pass a double-blind peer review. Two of these publications were accepted at international conferences and the other four publications were submitted to journals. Even though all publications were written with co-authors, the author of this doctoral thesis had the lead in each publication. Each publication is referenced with the number P1 – P6.

In the following, the six publications embedded in part B are summarized by briefly outlining the research problem, the methodological approach, and the main contributions of each publication.

No	RQ	Authors	Title	Year	Outlet
P1	RQ#1	Ertl, C.; Greger, V., Wolf, P.; Krcmar, H.	Analysis of Different Organizational Forms and Their Effect on Performance Management of IT	2014	Proceedings of the 14th European Conference on e-Government (ECEG), 85-92. ISSN 2049-1026
P2	RQ#1	Ertl, C.; Greger, V., Wolf, P.; Krcmar, H.	Analysis of Different Organizational Forms: Towards a Framework of Influencing Factors Regarding Performance Management of IT in the Public Sector	2014	Electronic Journal of e-Government (EJEG), 12(2), 157-168. ISSN 1479-439X
P3	RQ#2	Ertl, C.; Krcmar, H.	Das Modell von Burns und Scapens am Beispiel der IT-Auslagerung bei einem öffentlichen Unternehmen	2013	Proceedings of the 11th International Conference on Wirtschaftsinformatik (WI 2013), 863-878. ISBN 978-3-00-041359-9
P4	RQ#2	Ertl, C.; Herzfeldt, A.; Krcmar, H.	How to Overcome Transformation Barriers in IT departments of State-Owned Enterprises	2018	Journal of Public Administration and Governance, 8(1), 86-114. ISSN 2161-7104
P5	RQ#3	Herzfeldt, A.; Ertl, C.; Ehn, F.; Krcmar, H.	Prozesskostenrechnung bei einem Cloud-Computing-Anbieter – eine Einzelfallstudie	2014	Controlling, 26(12), 677-679. ISSN 0935-0381
P6	RQ#3	Herzfeldt, A.; Ertl, C.	Finanz- und Rechnungswesen an deutschen Flughäfen: Eine Fallstudie zur Optimierung kaufmännischer Kernprozesse	2016	Controlling, 28(3), 204-209. ISSN 0935-0381

Table 1: List of publications included in Part B of this doctoral thesis

P1 - Analysis of Different Organizational Forms and Their Effect on Performance Management of IT. So far, the literature differentiates only between private organizations and public administrations, when considering the organizational effect on IT management accounting. The purpose of this research was to compare the different of organizational forms and to identify their individual characteristics regarding IT management accounting. Therefore, a general literature review was performed to evince the characteristics of private enterprises, SOEs and public administrations. The identified characteristics are compared and analyzed concerning their influence on the usage of IT management accounting. The research revealed four characteristics of SOEs that influence IT management accounting distinctively compared to IT management accounting in private enterprises or public administrations. First, the stability and time horizon of IT-managers' decisions affected election periods. Second, the complexity of decision-making caused by political influence. Third, the organizational objectives that consists of one measurable objective and helps to implement IT management accounting. Finally, the managerial value of an organization which is linked with no sanction and less benefits mechanisms and, thus, restrain the successful use and create a tension towards the control function of IT management accounting. These four major individual characteristics of enlarge the knowledge about implementation and usage of IT management accounting in SOEs compared to private enterprises as well as public administrations.

P2 - Analysis of Different Organizational Forms: Towards a Framework of Influencing Factors Regarding Performance Management of IT in Public Organizations. Based on the results of P1, the purpose of this contribution was to deepen the effects of the four major characteristics of SOE. Thus, we again performed a literature review and determined the influencing factors for each characteristic. The literature review identifies several influencing factors for each of the four characteristics. Furthermore, the literature review yielded three influencing factors which could not be allocated to one of the four existing attributes. Those newly identified influencing factors were assigned to the bureaucracy of an organization. This characteristic explicitly represents the formal procedures in public organizations and the strict implementation of laws, rules and regulations. These influencing factors serve as basis for the determination of specific IT management accounting requirements.

P3 - Das Modell von Burns und Scapens am Beispiel der IT-Auslagerung bei einem öffentlichen Unternehmen. The purpose of this research was to test the capability of existing frameworks regarding organizational transformations in the SOE domain. Institutional theory served as basic theory. Institutional theory focuses on organizational transformations and has the capability to observe complex and dynamic processes (Suddaby et al., 2011). As one representative framework based on institutional theory, the concept of Burns and Scapens (2000) was selected and applied to an interpretive case study. The case study provides interview and documentary data of an IT-outsourcing process at a major German airport. Although, the application of the framework on the case study was possible, the results have only limited information value. The contribution shows that the analysis of the organizational transformations cannot be considered alone based on the framework by Burns and Scapens (2000). The general social context as well as the market environment of the company must be considered, too.

P4 - How to Overcome Transformation Barriers in IT departments of State-Owned Enterprises. Based on the findings of P1 to P3 we started a general literature review about organizational change in private and public management accounting literature. In total, we review 514 articles. After screening these articles, 19 articles remained left containing a theory or framework that focuses on organizational transformations in management accounting. We used the concept of Van de Ven and Poole (1995) to classify the basis theory of change regarding their unit and mode of change in the 19 articles. In total, nine articles base on life cycle theory as they depict the process of change in a single entity as progressing through a necessary sequence of prescribed stages: Burns and Scapens (2000); Chenhall and Euske (2007); Dambrin et al. (2007); Sharma et al. (2010); ter Bogt and van Helden (2000); Cunningham and Kempling (2009); Applebaum et al. (1998); Jayashree and Hussain (2011); Dillard et al. (2004). Eight of the 19 articles identified by the literature review explain changes in management accounting as teleology theory using a single entity and developing its future state in a constructive way: Abernethy and Brownell (1999); Ahrens and Chapman (2007); Englund et al. (2011); Hopwood (1987); Laughlin (1987); Lounsbury (2008); Roberts (1994); O'Grady et al. (2010). One article of the literature review meets with parameters of dialectic theory: Baines and Langfield-Smith (2003). The last paper presented by Jones (2005) uses evolution theory as it consists of a prescribed sequence of variation, selection, and retention events among several entities. Based on these differences, we proposed that only theories and frameworks using life-cycle theory are considered as highly relevant for the further development of a framework for SOEs. Because of their limitation to one entity and the prescribed change goals, these frameworks enable a detailed analysis of the effects on the management accounting system arising from planned organizational transformations (Suddaby et al., 2011; Bjorck, 2004). Next, we evaluated the remaining articles regarding their match with the requirements on management accounting in SOEs, whereupon three articles remained. To ensure a rigor integration of the different frameworks, we used the punctuated equilibrium model of change. The elements of each framework were assigned to the basic states of organizational change (Gersick, 1991; Sabherwal et al., 2001). By integrating the articles of Burns and Scapens (2000); Sharma et al. (2010) and Cunningham and Kempling (2009), all four requirements are be fulfilled. Finally, a new framework for conceptualizing organizational transformations of management accounting in SOEs was evolved.

After evolving the SOE framework we applied it to a case study. This enabled us to identify first success factors of organizational transformations in SOEs. One reason for the successful change revealed by the framework bases on the combination of the need for change and the stability of the guiding coalition. Another success factor is grounded on the set-up of a new organizational unit implementing new team constellations and concentrating economic know-how to enhanced staff competencies. This led to a broad support of the change process on the employees' level.

P5 - Lessons Learned aus der Umsetzung der Prozesskostenrechnung bei einem Cloud Computing-Anbieter. With this publication we wanted to observe the implementation of a new management accounting instrument in the IT department of a SOE in-depth. Based on several interviews, conducted between October 2012 and February 2013, we observed how new rules and routines are established in practice. The initial challenge was to identify, which benefit can be generated, when implementing process cost accounting. As major advantage, we could determine the increased validity of cost reports and, resulting from this, an increased credibility of the IT management accounting department. Moreover, the new routine provides additional information for potential benchmarking initiatives, which supports the attitude of employees to contribute to these initiatives.

P6 - Finanz- und Rechnungswesen an deutschen Flughäfen: Eine Fallstudie zur Optimierung kaufmännischer Kernprozesse. This research identifies twelve lessons learned to reduce costs in the financial and accounting department of German Airports. Therefore, we analyzed data from a case study research and three expert interviews. The results can be clustered into three areas of activity: employees, governance and IT infrastructure. From an employee's perspective, we recommend offering more trainings on how to use the different commercial IT systems, to supplement monetary incentive structure, and to increase the acceptance of IT systems through ensuring a continuous improvement process. Regarding governance structures we suggest striving for a standardized fee and charge rules framework, to specify uniform account assignment guidelines and provide checklists in combination with uniform accounting standards, and to introduce activity-based costing. For the IT infrastructure, our lessons learned encompass the introduction of cross-departmental workflows, optimizing interfaces to systems within and outside of financial accounting, increasing the proportion of digital incoming and outgoing invoices, implementing digital archiving systems, and introducing consistency filters and automatic quality checks.

1.4 Related Work

In addition to the publications listed in the previous section, two further articles were published as part of the research work. These publications are also related to the management accounting system. The focus of this research was to show the impact of organizational capabilities such as learning and predictive planning on the profitability of Cloud-Service providers. The results of the research show new insights into how the management accounting system can be designed to deliver profitable services.

P7: The Role of Individualization and Project Learning for Cloud Service Profitability.

The cloud computing market is constantly growing and becoming a more and more important industry sector. Some studies estimate the global market for public cloud service will reach a volume of more than US \$300bn by 2019. Hence, there are many challenges encountered by providers offering cloud services and it is a difficult market for two specific reasons. First, the advantages of cloud services are mainly realized by the customer, while risks are shifted to the provider. Second, the market environment itself is highly challenging with its strong price competition and new market entrants. In this paper, we focus on the provider's perspective to answer the question: "What makes a cloud service business model profitable in light of market competition and special cloud service constraints?" We build our research on service-dominant logic (SDL), the resource-based view of the firm (RBV), and organizational learning theory (OLT), to derive the importance of project learning and individualization capability for corporate profitability. Based on the theoretical perspectives described above, we investigated the factors that play a role in determining the profitability of delivering cloud services from a provider's perspective. Our model comprises four elements: (1) individualization capability, (2) project learning capability, (3) service delivery costs, and (4) profitability. To test the hypotheses in our model we used survey research as the methodology for this study. Our data were derived from 78 fully completed surveys from different cloud service providers. The questionnaire was part of a larger study on profitability of cloud computing offerings which was sent out to 2691 recipients and conducted between 2013 and 2014. We then used structural equation modelling (SEM) for analyzing our model since it allows for the modelling of multiple independent relationships. All hypotheses, except the hypotheses that project learning capability has an influence on profitability, are supported on at least a 95 percent significance level. The SEM also showed that market share and company size do not have a significant influence on profitability.

Thus, our research indicates that project learning and individualization capability of an organization influence cloud service profitability. We found that project learning capability leads to a cost reduction of the cloud service delivery and, consequently, increases the profitability. Furthermore, companies in our sample that had a high individualization capability had higher service delivery costs but, at the same time, realized a higher profitability.

P8: The Role of Value Facilitation Regarding Cloud Service Provider Profitability in the Cloud Ecosystem. As indicated in P7, dynamic conditions in the cloud service market have led to the situation that providers need to shift their attention to providing cloud services efficiently and profitably. Several studies show that there are some highly successful cloud service providers in terms of profitability and others lag behind. Thus, the goal of this research is to investigate the effect of building up resources in advance of future customer engagements as antecedent for cloud service provider profitability. We build our research on the value

facilitation concept, as well as on the resource concept from the resource based view. We carried out 14 expert interviews with cloud service project managers, cost experts and board members from 10 different organizations to gather the required data for our exploratory qualitative research.

The interview data supports the hypothesis that value facilitation in terms of building up IT infrastructure, IT personnel and IT management capabilities in advance of future customer engagements is positively associated with cloud service profitability. Based on the interview results, this is because providers which are well-facilitated incur lower costs in the value co-creation process as they can revert to already existing resources, which, in turn, leads to higher service profitability.

The findings from the interviews further show that providers which do not build up reusable resources in advance to future customer engagements experience high value co-creation costs and low profitability as they need to design and implement resources on a project-specific basis for each customer. Accordingly, this setting does not allow providers to profit from economies of scale and scope. However, a too high degree of value facilitation (e.g., excess software features) also leads to low profitability. When over-facilitated, providers have invested time and money in building up resources they cannot make use of during value co-creation processes. Thus, they have misaligned their value facilitation efforts with customer needs.

2 CONCEPTUAL BACKGROUND

In this chapter the conceptual background of this doctoral thesis is explained. The first section of this the chapter defines SOEs in the context of this research. Based on this definition, the differences regarding IT management accounting in the three organizational forms are provided. This chapter also presents the definition for the organizational change terminology.

2.1 Defining State-owned Enterprises

SOEs belong to the public sector and are often also known as publicly owned corporation, government business enterprise, government-owned corporation, commercial government agency, or public organizations. They pursue both: providing fundamental public services and thinking commercial operation. Thus, they are legal entities which execute commercial activities on behalf of a government. In contrast to public administrations, which pursue purely non-financial objectives, SOEs are more cost effective and ensure economic measurability (Stölting, 2001). As they are wholly or partially owned by a government, they are directly or indirectly controlled by governmental authorities. Therefore, they need to consider public environment, such as legal constraints and political concerns when designing the management accounting system (De Lancer Julnes & Holzer, 2001).

SOEs are common throughout the world providing infrastructure (e.g. airports and railways), public services (e.g. mail and telecommunications), natural resources and energy, broadcasting (e.g. television and radio), and merit goods (e.g. healthcare). They predominantly originate from the period of privatization, taking place in the 1980s to 1990. By now, they contribute to global economy to a significant extent (Kowalski et al., 2013), e.g. Pemex, which is the largest company in Latin America is owned by the Mexican government.

For our contribution, we define public organizations in a narrow sense as economically and socially oriented organizations which are directly or indirectly subject to a controlling influence by public authorities.

2.2 Differences in IT Management Accounting

Private enterprises, public administrations and SOEs vary significantly in some characteristics and these differences influence content and process of IT management accounting (Boyne, 2002; Nutt & Backoff, 1993). To get a systematic overview on the individual characteristics of the different organizational forms, a comprehensive literature review according to Webster and Watson (2002) was performed. To ensure a systematic and comparative approach for the analysis of organizational characteristics, the findings from the literature review were clustered according to Boyne's (2002) four main theoretical effects of publicness: *organizational environment*, *organizational goal*, *organizational structures* and *managerial values*. As these attributes do not cover all characteristics which were revealed, Boyne's classification schema was extended with further attributes, e.g., purchase regulations or IT landscape. If the search turned up only the characteristics of private organizations and public administrations, the characteristic of public organizations was supplemented by data from specified literature of the public organizations' domain.

In total, 18 attributes were identified. They can be compared due to their specific characteristics in the different organizational forms (Ertl et al., 2014). Building on this detailed composition, a comparative analysis of characteristics effecting management accounting in IT departments can be conducted.

The compositions clearly reveal that public organizations possess a mix of characteristics of private organizations (e.g., the focus on output performance and a homogeneous group of customers) and public administrations (e.g., political influence and lower managerial autonomy) (Ertl et al., 2014). In a next step, only those attributes were considered that influence use and success of IT management accounting (Schwertsik et al., 2009; Greger et al., 2013; Chenhall & Morris, 1986). Thus, the total number of attributes can be reduced from 18 to four. Figure 1 shows the four attributes that differently influence IT management accounting in the three organizational forms.

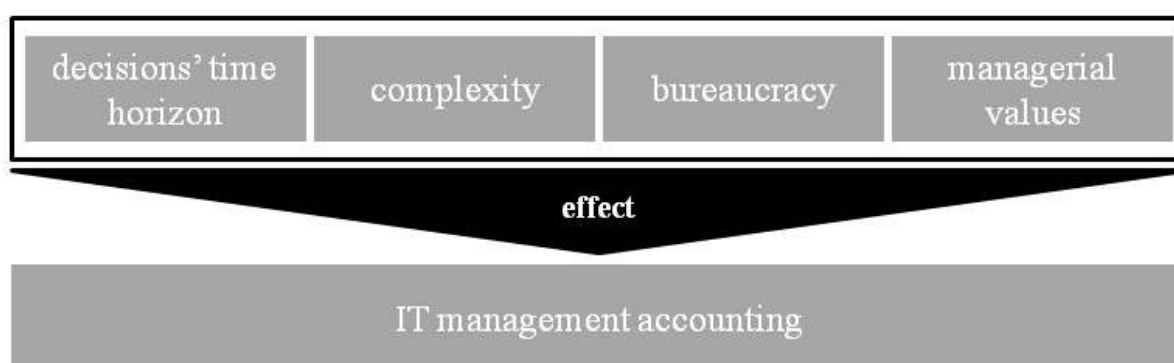


Figure 2: Characteristics of IT management accounting in SOEs

The first attribute influencing IT management accounting is the *stability and time horizon of managers' decisions*, which can result in short-term instructions or a change in long-term strategic directions. As private organizations show clear and sustainable strategic decisions, they can focus on one master business case. In contrast, SOEs are influenced by a supervisory board or political conditions (Nutt & Backoff, 1993; Boubakria et al., 2008). Because major decisions of the supervisory board, which is mainly staffed with politicians, can change after an election, the management accounting of SOEs needs to have various business plans at their disposal. These alternative plans are necessary for the simulation of the decisions' consequences and the assessment of multiple risks which these decisions may have on the organization. Strong political influence and unstable decision-making is also an issue for public administrations and can result in rough budget planning which does not address sales volume, cost and revenues. The time horizon in public administrations is also strongly connected to election cycles (Bozeman, 1987; Nutt, 1999). The short time horizon effects IT management accounting, because the organizations' objectives, including the IT goals, may change after an election. Thus, a framework for SOEs must represent the dynamics in the management accounting processes.

Another effect on management accounting is caused by the *complex decision-structures* of SOEs which distribute decision-making responsibilities to various individuals (Lachman, 1985; Nutt, 2006; Boyne, 2002; Brewer & Brewer, 2011). Consequently, actions of IT management accounting can only be executed if various decision-makers reach an agreement on a particular measure. This can be difficult, as IT managers in the public sector need to consider political

decisions and topics of public interest. Moreover, these decision-structure enables external and internal stakeholders to influence internal reporting processes and management accounting methods (Greger et al., 2013). By contrast, IT management accounting in private organizations is affected by legal restrictions or internal compliance rules as well as the already mentioned customer and product perspective (Nutt, 1999). This concedes a high managerial autonomy when deciding about methods and measures concerning IT management accounting (Rainey et al., 1976). In the public sector, upper-level managerial roles are often filled by a politician, who may pursue his own objectives when making decisions (Farnham & Horton, 1996; Lachman, 1985). IT managers in public administrations must deal with the autonomy of unique departments due to the departmental principle which makes it difficult to implement an overall IT management accounting concept (Schwertsik et al., 2009). Therefore, stakeholders of an organization influence IT management accounting which stresses the integration of a stakeholder perspective in the framework for SOEs.

The third element with impact on IT management accounting is *bureaucracy*. SOEs show a high conformity with private organizations. Both usually provide one product portfolio and have a homogenous customer group. However, the focus on procedures and policies in the public-sector causes guidelines and regulations which subsequently need to be implemented in management accounting (Boyne, 2002). Consequently, rules and routines need to be considered in the conceptual framework to align internal IT accounting methods with the legal requirements (De Lancer Julnes & Holzer, 2001). This bureaucratic definition of rules and routines in IT management accounting is necessary as SOEs often work as a local monopoly and legal constraints need to ensure fair and transparent cost and price calculations for all customers that use the service of the SOE.

As a last influencing element, the *managerial value* of an organization is mentioned. The theory of property rights is linked to reward and sanction mechanisms. Employees in private organizations have an interest in IT management accounting as they want to ensure cost efficiency to gain monetary rewards and to avoid sanctions. Another aspect of this attribute refers to the employee's attitude and commitment to the organization which also differs between the two organizational forms (Pratchett & Wingfield, 1996). Employees in SOEs show perceivable organizational commitment, even though complex-decision structures, which need to be overcome, may negatively affect this commitment (Carver, 2006). Therefore, the fourth characteristic encompass the attitudes and aspirations of SOEs' employees.

Summarizing this section, SOEs encompass these four major characteristics affecting management accounting of SOEs: (1) dynamic processes which arise from the variable time horizon of managers' decisions, (2) complexity of the decision process by integrating various stakeholders, (3) detailed representation of management accounting processes via rules and routines to deal with the bureaucratic constraints, and (4) consideration of public employees' attitude

To consider the effects of organizational characteristics on IT management accounting, following four requirements need to be considered when analyzing transformations in SOEs:

1. **Incorporation of dynamic processes which arise from the complex management accounting with various business cases.**
2. **Integration of stakeholders, including managers as well as politicians and the public.**
3. **Detailed representation of management accounting processes via rules and routines.**
4. **Consideration of public employees' attitude and commitment to the organization.**

2.3 Defining Organizational Transformations

A transformation can be described in two different forms of change. First-order changes, also known as 'planned change' or 'managed change', refers to changes that are actively arranged by the organization members (Levy and Merry, 1986). Hence, there is a slight distinction between those two change processes. To overcome organizational difficulties, internal or external experts generally help to plan and implement the intended changes in a 'planned change' (Levy and Merry, 1986). In contrast to this, a 'managed change' is performed by managers that plan and implement the changes (Levy and Merry, 1986). These two perspectives are often merged using the expression 'planned change' and managers operate as both agents of change and experts coeval (Levy and Merry, 1986). According to Levy and Merry (1986), first-order change is characterized by the following four criteria: (1) involving a deliberate decision to engage change, (2) reflecting the process of change, (3) involving internal and external expertise, and, (4) involving a strategy of collaboration and power sharing between the expert and the change clients.

Besides first-order change, a transformation can also arise from a second-order change. Second-order changes refers is also described as organization or organizational transformation.

First-order change	Second-order change
A change in one dimension, component or aspect	Multidimensional
A change in one level (individual or group level)	Multilevel change (individuals, groups, or the whole organization)
Change in one or two behavioural aspects (attitudes, values)	Changes in all behavioural aspects (attitudes, normes, values,...)
A quantitative change	A qualitative change
A change in content	A change in context
Continuity, improvements and development of the same direction	Discontinuity, taking a new direction
Incermental changes	Revolutionary jumps
Logical and rational	Seemingly irrational, based on different logic
Does not change the world view, the paradigm	Results in a new world view, new paradigm
Within the old state of beeing (thinking and acting)	Results in a new state of beeing (thinking and acting)

Table 2: First-order and second-order change (adapted by Levy and Merry, 1986)

In second-order change the transformation evolves in a multidimensional, qualitative, discontinuous, radical change involving a paradigmatic shift (Levy and Merry, 1986). Table 2 summarizes the characteristics of first-order and second-order change.

Regarding the research in this doctoral thesis, organizational transformations will encompass intellectual reframing as well as structural changes (Child & Smith, 1987). This complies with a second-order change. A usual and prominent method to for characterizing and investigating fundamental organizational transformations, the punctuated equilibrium model of change has emerged (Romanelli & Tuschman, 1994). Therefore, we will use this method to ensure a rigor evolution of the SOE framework for organizational transformations of IT management accounting.

2.4 Institutional Theory

Based on the hypotheses that the existing theories are too static to capture the dynamic effects of changes due to the complexity and size of today's enterprises, new theories have evolved (Suddaby et al., 2011) The premise that changes in a company are significantly affected by social and personal interests leads to the application of institutional theory as new basis for the interpretation of organizational transformations (Romanelli & Tuschman, 1994). In contrast to open systems theory, which emphasizes the impact of external environmental on a company, institutional theory focuses on the organizational and cultural factors within the organization (Scott, 2008). According to the definition of Scott (2004), institutional theory considers processes that establish rules, norms, and routines in the organization and thus become part of the institution (institutionalized). Björck (2004) stressed that the precise focus on organizational structures is very good to interpret organizational transformations in IT management accounting. Moreover, institutional theory considers also the corporate organization, which is assumed to have an essential influence, too. Thus, institutional theory serves as a suitable theory to analyze organizational transformations in IT management accounting.

So far, three theories that follow the basic idea of institutional theory have been used in accounting literature (cf. Miller, 1994), namely: new institutional economics (cf. Walker, 1998); old institutional economics (cf. Scapens, 1994); and new institutional sociology (cf. Carruthers, 1995). Due to the focus on analyzing changes in IT management accounting based on organizational factors, old institutional theory provides the necessary starting points for structuring the process of change in management accounting and focuses attention on the organizational rules and (work) routines (Burns and Scapens, 2000). In addition, it provides a way of dealing with some of the difficulties associated with the application of Giddens' (1984) structuration theory in accounting research.

The main aspects in the old institutional economy are institutions, actions, rules and routines. Institutions are structures that include the rules that are taken for granted and the common understanding of values as well as the decision-making powers within the organization (Burns and Scapens, 2000). These rules serve to restrict, control and support social behavior within institutions (Björck, 2004). Institutions create the prerequisite for differentiating different roles of employees with their respective areas of responsibility, authority and relationship organization (Burns and Scapens, 2000).

Actions follow the assumed assumptions of the institutions. Burns and Scapens (2000) describe the relationship between institutions and actions, such as the relationship between speech and

language. Two other components of the old institutional economy are rules and routines. Rules include concrete procedural instructions and formal descriptions of the management accounting system. Routines on the other hand represent the currently used management accounting methods, i.e. the execution of the management accounting instruments (Burns and Scapens, 2000). In the literature on the old institutional economy, there are numerous dichotomies that allow insights into the processes of change and the classification of these allow instruments (Burns and Scapens, 2000). In Burns and Scapens (2000), three dichotomies, which are of importance for changes in management accounting, are mentioned and described in more detail:

Formal and informal change in management accounting

Formal changes are characterized by the deliberate design or introduction of new rules or routines (Rutherford, 1994). This form of change is often brought top-down into the organization and instantiated by new procedural instructions and management accounting methods (Burns and Scapens, 2000). The informal change takes place on the implicit level. Over a period of time, new (work) routines replace the techniques used so far, without a targeted change being pursued, solely by repeating new process steps (Burns and Scapens, 2000).

Revolutionary and evolutionary change in management accounting

While a revolutionary change leads to a fundamental transformation of the existing rules and routines, the evolutionary change has an incremental nature and leads only to minor adjustments to existing rules and routines (Burns and Scapens, 2000). In practice, it can happen that a significant change in the content of the management accounting system only has a minor effect on the existing (work) routines and structures (Burns and Scapens, 2000).

Regressive and progressive change in management accounting

Another dichotomy of change goes back to the definition of Tool (1993). He differentiates between 'ceremonial' behavior and 'instrumental' behavior. The 'ceremonial' behavior aims to preserve existing power structures, which Tool (1993) calls regressive change. On the other hand, he sees 'instrumental' behavior that seeks to solve problems that arise with the best existing knowledge or technology. Progressive changes mean that 'ceremonial' behavior is replaced by 'instrumental' behavior, whereas regressive change leads to a strengthening of 'ceremonial' behavior, thereby hampering institutional change (Burns and Scapens, 2000).

3 RESEARCH APPROACH

This chapter describes the research approach guiding this doctoral thesis by introducing the general research strategy and the applied research methods.

3.1 Research Strategy

This doctoral thesis employs a qualitative research approach to answer the stated research questions as mentioned above. It follows the basic approach of behavioral science (Schnell et al., 2005; Atteslander 2003). The research design bases on the suggestions of Hevner (2007). We used this research design because it needs handle the complexity of SOE organizations, especially in the IT department with additional legal constraints and high management attention, and to provide a rich understanding of antecedents and environmental issues underlying the transformation process. This can be addressed by qualitative research methods such as positivistic case studies. We are observing a phenomenon that occurs in practice, but has not been researched comprehensively.

The environment, in which this research is based, is framed by three factors: (1) the management accounting team of the IT department as central research unit, (2) organizational transformations caused by reorganizing business structures as analyzed change approach, and, (3) the level of analysis which reaches down to the process level of the organization to include rules, routines and actions in the research design. To identify distinct SOE characteristics we conducted comprehensive literature reviews. The identified characteristics serves as a basis for the evaluation of existing frameworks regarding their capability to be applied in the SOE domain. The evaluation allows us to build an integrated framework that conceptualizes organizational transformations in SOEs by using the punctuated equilibrium model of change as instrument for the design circle.

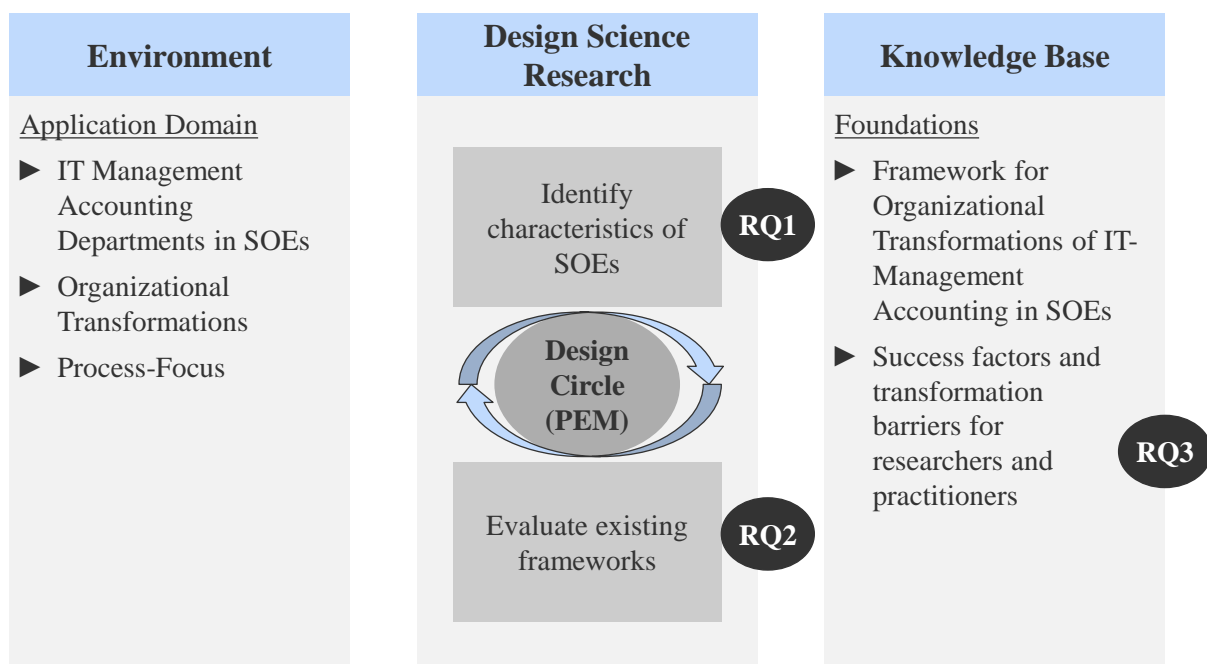


Figure 3: Visualization of the research strategy linked with the stated research questions

Resulting from these two steps, the knowledge base can be enlarged by (1) a new framework that considers the characteristic and requirements of SOEs and (2) first indications for success factors and transformation barriers in the change process of IT management accounting in SOEs. These findings result from the application of the framework to two case studies. Thus, the stated research questions can be assigned to the three-cycle view of design science research (s. Figure 3).

3.2 Research Methods

3.2.1 Literature Review

One basic method for this research are literature reviews. A literature review intends to explore the existing body of knowledge regarding a certain topic (Webster & Watson 2002). To ensure rigor results when conducting a literature review, we followed to the recommendations according to Webster and Watson (2002), Levy and Ellis (2006) and Okoli and Schabram (2010). In total, we conducted three literature reviews during this doctoral thesis. Each one of them consists of three steps: boundaries, literature search and selection, and coding of the article content. The steps of the single literature reviews are described in the following. The number in brackets concerning the boundaries of the literature review refers to Cooper's (1989) Taxonomy of Literature Reviews:

Literature review 1 (s. publication 1):

The goal of the literature review was to identify attributes that describe different organizational forms. As boundaries of this research we focused on research findings (1) regarding organizational attributes, (2) to identify existing characteristics (3) organized in a conceptual way, (4) using a neutral view (5) for a specialized scholar audience and (6) encompassing exhaustive literature exhaustive review with selective citation of published journals and conferences in the public sector. Searching for literature, we focused on e-government specific conferences, like FTVI (Fachtagung Verwaltungsinformatik), HICSS (Hawaii International Conference on System Sciences) and IFIP eGOV (International Federation for Information Processing Electronic Government), as well as databases, like Ebsco, Emerald or Springer Link. We used two categories of search terms: (1) [attribute; characteristic] and (2) [public sector; private sector; public organization; public administration] and combined the terms of category 1 with those of category 2 by using 'and' as well as 'or' combinations. In total, the literature review revealed 60.998 papers, out of which 38 papers were classified as relevant, as they deal with characteristics of private organizations, public organizations or public administrations. We coded the remaining 38 articles according to Boyne's (2002) four main theoretical effects of publicness.

Literature review 2 (s. publication 2):

The goal of the literature review was to deepen the understanding of influencing factors especially in the public sector. Therefore, we focused our literature review on research findings (1) regarding IT management accounting in the public sector, (2) to identify existing influencing factors (3) organized in a conceptual way, (4) using a neutral view (5) for a specialized scholar audience and (6) encompassing representative literature encompassing journals and conferences which deal with information management, IT performance management or issues of the public sector. Thus, we again selected conferences like FTVI (Fachtagung

Verwaltungsinformatik), HICSS (Hawaii International Conference on System Sciences) and IFIP eGOV (International Federation for Information Processing Electronic Government), as well as public journals in databases, like Ebsco, Emerald or Springer Link. We used three categories of search terms: (1) [performance measurement; performance management; cost-benefit-analysis; evaluation; management accounting], (2) [IT; information system], and, (3) [government; public sector; public administration; e-government; NPM]. We combined terms of the different categories by using ‘and’ and ‘or’ combinations. In a first step, we found 583 papers. After abstract and title scanning, we identified 197 papers which dealt with IT-PM. Those papers were explored regarding potential influencing factors. The found influence factors were allocated to the characteristics of IT management accounting in SOEs.

Literature review 3 (s. publication 4):

In this literature review we wanted to prepare a state of the art overview regarding organizational change in management accounting. We aimed (1) to analyze current theories on management accounting change, (2) to criticize and integrate existing frameworks, (3) organized in a conceptual way, (4) using a neutral view (5) for a general scholar audience and (6) encompassing representative literature. Thus, the selection of journals selection includes major management accounting and public management journals: Accounting, Auditing & Accountability Journal (AAAJ), Abacus, Accounting Horizons (AH), Accounting Organizations and Society (AOS), Accounting Review (AR), British Accounting Review (BAR), Contemporary Accounting Research (CAR), Critical Perspectives on Accounting (CPA), European Accounting Review (EAR), International Journal of Public Sector Management (IJPSM), Journal of Accounting and Economics (JAE), Journal of Accounting Research (JAR), Journal of Management Accounting Research (JMAR) and Management Accounting Research (MAR), Measuring Business Excellence (MBR), Management Decision (MD), and Public Management Review (PMR). The search term [organizational change] was applied to the search fields abstract, title and keywords. The timeframe of the search was not limited so that all issues of journals available in the databases were included. Overall, the literature review yielded 514 articles. We screened all 514 articles in terms of title and abstract as to whether they comply with the following criteria. Firstly, the article must cover changes in the management accounting department itself. Secondly, all articles were excluded that handle with changes of specific management accounting methods to obtain the general focus of the literature review. After these two steps 69 articles remained. Finally, all articles containing a case study research were excluded, because, as described above, the focus of the research is the identification and evaluation of theories in this field. Finally, 19 articles remained. In the next step, the 19 articles were coded with the following coding elements. First ‘basic theory’, which refers to the theory applied by the authors to develop their framework. The next coding elements represents a reference, if the provided framework bases on the ideas of other authors. The coding element ‘focus’ briefly describes the main idea and concept of the framework. The next coding elements evaluate the unit and the mode of change according to the concept of Van de Ven and Poole (1995). The last coding element represents the change theory resulting from mode and unit of change.

3.2.2 Requirements-based Evaluation

Another research method was used to evaluate existing theories and frameworks on management accounting change, which form the result of literature review 3. To ensure a rigor

evaluation, we base our requirements-based evaluation on the evaluation framework presented by Karlsson et al. (1998). The framework consists of five major steps. First, the goal of the evaluation must be defined (evaluation definition). Second, evaluation criteria must be determined regarding whether they are objective or subjective measures. Also, the scale of measurement must be described in this step. Next, the execution of the evaluation operation in terms of preparation and execution is suggested. Then, they list some possible threats to validity of the evaluation process. As last step, the results of the evaluation are analyzed.

With respect to the performed requirements-based evaluation in this doctoral thesis, the goal of the evaluation was to gain a better understanding of existing frameworks on management accounting and their consideration of distinct SOE characteristics derived from the literature reviews. Thus, we aim to evaluate six final concepts based on the literature review and the classification according to Van de Ven and Poole (1995) from the perspective of SOEs represented by four requirements on IT management accounting. Thus, our measures encompass four objectively determined measures that were identified by conducting two literature reviews. As the objective measures represent qualitative and not quantitative requirements, the scale of measurement is differentiated in three discrete stages: (1) 'match', if the evaluated article comprehensively explain the and explicitly implement it into the framework, (2), 'partial match', if the objective measure is briefly considered but not incorporate into the framework, and, (3) 'no match', if the not the analyzed requirement is not comprised. This evaluation process had some limitations regarding its validity. One threat to validity bases on the limited number of objective measures, which depend on the literature review that revealed those four SOE requirements. Another limitation is owed to the single person operation of the evaluation process. However, the application of evaluation framework according to Karlsson et al. (1998) provided valuable results for developing a holistic framework that considers the characteristics and requirements of IT management accounting in SOEs.

3.2.3 Punctuated Equilibrium Model

When evolving a new framework based on existing frameworks, one big challenge is to really integrate the basic frameworks and not to loosely combine them. To avoid a loosely combination of frameworks the application of a meta model is essential. The punctuated equilibrium model (PEM) of organizational transformation is a well-established concept that differentiates stable and revolutionary organizational phases and provides basic patterns of organizational activity (Romanelli & Tushman, 1994). The phase of stability, called the equilibrium is characterized by persistent structures and only small and incremental changes inside the organization (Gersick, 1991). The second state describes short periods of revolution, the 'punctuations', which fundamentally alter the patterns of activity and cause qualitative changes (Sabherwal et al., 2001). To ensure a rigor integration of the different frameworks, we use PEM to assign all elements of the selected frameworks to the organizational phases as well as the patterns of activity. Based on this classification, the individual elements of the frameworks can be integrated comprehensively based on a common pattern of activity in combination with the corresponding organizational stage.

3.2.4 Case Study

To gather the necessary qualitative data for this research, we used positivistic case studies according to Dubé and Paré (2003). Case studies are appropriate in this context as they provide an empirical inquiry that explores a contemporary phenomenon in its empirical context (Yin, 2002). Case studies are also appropriate to test frameworks (Yin, 2008). Thus, case studies are used to apply the evolved framework and to test its innovative capabilities.

Search strategy

As search strategy for suitable cases, ‘intensity sampling’ was applied (Patton, 2002). To be selected as a case, the SOE had to provide in-depth experience in the field of organizational transformations to ensure that sufficient information can be gathered to evaluate the capabilities of the framework. In the end, a German airport was selected, who outsourced its IT department several years ago. Thus, the airport had to deal with changes regarding methods and activities in the IT management accounting department. The case covers a variety of organizational transformations at IT management accounting departments and provides diversity to test all aspects of the framework. Choosing this object of investigation allows insight into the results of the change process that occur after outsourcing.

The main instrument used for data collection was semi-structured interviews. The guideline for the semi-structured interviews covers four subject areas: structure of the company, used management accounting techniques, experience of the outsourcing process and the determination of success or failure factors. The main criteria for choosing the interview partner was comprehensive experience regarding the whole outsourcing process, possession of fundamental knowledge in the field of management accounting and whose ability to describe changes in IT management accounting department from a general perspective. This reduced and focused approach follows the requirements of the homogeneity random sample by Patton (1990). In total, we conducted 10 interviews with five interview partners. The interview sessions took place in 2012, 2014 and 2017.

The interviews were conducted on-site or via telephone and lasted between 45 and 120 minutes. In terms of content, the interviews cover a timeframe encompassing the whole outsourcing process. Thus, the state of IT management accounting before and after outsourcing and the change process can be documented. Subsequently the interviews were transliterated for analysis purposes by two researchers. Because of the high experience and the long field affiliation of the interviewed managers, the results from the qualitative data collection process can be classified as valid.

Besides the interview data, additional information from publicly accessible sources could be generated. This encompasses organization charts, business reports and service descriptions. As these are audited annual financial statements and official information about the company or its subsidiary, this information is also classified as reliable. The information could be used to comprehend the statements of the interview partners regarding the four subject areas mentioned above.

Data analysis

The case study analysis draws on the recommendations of Dubé and Paré (2003) and Paré (2004). To evaluate the information from the interviews systematically, the interviews were coded in a spreadsheet according the guidelines of qualitative content analysis by Mayring (2009). For this purpose, the transcribed literal statements were summarized and limited to their content. Next, four coding elements were recorded separately: first, the answer was classified whether it refers to the period before or after the outsourcing. Then the management accounting technique is extracted within the statement. The fourth coding element is implemented to record the success factors.

Evaluation of the case studies

Moreover, the case studies were examined, whether the practical examples are suitable for conducting a case study according the seven principles of Klein and Myers (1999). The assessment shows gaps particularly in the last two principles: ‘the principle of multiple interpretations’ and ‘the principle of suspicion’. However, these in turn are influenced positively by the model-based incorporation of the public employees’ attitudes according to principle 4 ‘the principle of abstraction and generalization’. Consequently, the practical examples can be used for an interpretive case study.

4 DISCUSSION

The following chapter summarizes the main contributions of the six publications included in this doctoral dissertation. We emphasize how each of the publications contribute to answering individual aspects of the research questions.

4.1 Summary of Findings

RQ#1: What are the characteristics that distinctly differentiate IT management accounting of SOEs from private enterprises and public administrations?

Summary of findings in P1. To enhance the understanding of the special requirements for IT management accounting in SOEs, it was first necessary to identify the organizational characteristics of SOEs. While IT management accounting has been used as a decision-making instrument by private enterprises for many years (Johnson, 1983), many initiatives have been implemented in the public sector under the term New Public Management (NPM) to improve management accounting processes based on private sector concepts. These concepts of IT management accounting have also been employed in SOEs in recent years. However, SOEs still face big challenges regarding the usage of IT management accounting. A major reason for the difficulties in the application of IT management accounting is that the transfer of concepts from the private sector did not consider the organizational characteristics of SOEs. IT management accounting in SOEs poses difficulties, e.g. when it comes to combining internal accounting methods with the legal requirements in a regulated market environment (De Lancer Julnes & Holzer, 2001). Thus, this publication establishes a collection of organizational characteristics that clarifies the differences between SOEs, private enterprises and public administrations.

To provide a systematic approach, we used the structure of Boyne (2002) with its four main theoretical effects of publicness: *organizational environment*, *organizational goal*, *organizational structures and managerial values*. Boyne (2002) already defined some attributes for these categories. Hence, these attributes do not cover all characteristics which we identified. Thus, we extended Boyne's classification with further attributes, e.g. IT landscape.

Regarding the category *organizational environment*, we identified that the characteristics of SOEs are similar to those of public administrations, for example when looking at the attributes stakeholders, permeability, purchase regulations and funding. However, there is also a common attribute between SOE and private enterprises about the underlying performance management force in the organizational environment, which in both cases is derived from a competitive market environment.

Within the second category *organizational goals*, SOEs are like private organizations in terms of the nature of their products and customers, as well as to public administrations regarding primary constraints and objectives.

In the third category *organizational structures*, SOEs also show features of both public administrations and private enterprises. For example, the attributes complexity of decision-making and managerial autonomy show the same characteristics in SOEs and public administrations. The perspective of performance management, on the other hand, is a common attribute of private enterprises and SOEs.

Analyzing the category *managerial values*, we noticed that in this category SOEs have more attributes in common with private organizations, e.g. that IT-managers of both are driven by a

strong financial motivation and both organizations work with a financial reward system. The main difference to private organizations is that SOEs have less sanction mechanisms.

As the comparisons of the three organizational forms following Boyne's (2002) four categories shows, the assumption that SOEs own a mix of characteristics of private enterprises and public administrations can be affirmed. In a more in-depth analysis, we focused on the characteristics influencing the use and success of IT management accounting (Schwertsik, Wolf & Krcmar, 2009; Greger, Wolf & Krcmar, 2013; Chenhall & Morris, 1986). The discussion of the characteristics points out that the characteristics availability of objectives, stability and time horizon of decisions, complexity of decisions and managerial value influence composition, use and success of IT management accounting in SOEs heavily. The occurrence of one measurable objective, as it appears in private organizations, helps to implement IT management accounting in SOEs. However, complex decision-making structures, political influence, no sanction and less benefits mechanisms restrain the successful use of IT management accounting in SOEs and create a tension towards the control function.

Thus, we finally derived four characteristics that specifically influence IT management accounting in SOEs: *availability of objectives*, *stability and time horizon of decisions*, *complexity of decisions* and *managerial value*.

Summary of findings in P2. Based on the research of P1, we wanted to enhance the findings by validating them with an additional, more focused literature review, and enlarge the understanding regarding their relevance and implication on IT management accounting in SOEs by analyzing the relevant influencing factors of each organizational characteristic. Thus, we could derive two new major contributions.

First, the additional literature review confirms essential characteristic of SOEs and adds further influencing factors to the basic four characteristic. For example, the characteristic *stability and time horizon* is extended by the two influencing factors 'acceptance at politics' and 'political environment'. Furthermore, the identified influencing factors 'external requirements' and 'IT-landscape', which encompasses the technical aspects as identified in the literature review, are assigned to the characteristic *complexity*. Also, the characteristic *managerial value* is supplemented by two further influencing factors: the 'availability of cultural change' and the 'skills of employees regarding IT management accounting'.

However, some newly discovered influencing factors could not be integrated in the existing four basic characteristics. This leads to the second major contribution of P2. In consideration of the up to now not integrated influencing factors comprising the formal procedures for decision making flexibility of internal processes, a new organizational characteristic *bureaucracy* is supplemented. Thus, it encompasses all influencing factors that are required to comply with the demand for monitoring and accountability in public sector organizations. This fifth organizational characteristic explicitly represents the formal procedures in public organizations and the strict implementation of laws, rules and regulations (De Lancer Julnes & Holzer, 2001).

Finally, five organizational characteristics (*objectives*, *stability and time horizon*, *bureaucracy*, *complexity* and *managerial values*) have been identified that distinctively differentiate SOEs form private enterprises and public administrations and have a significant influence on IT management accounting in SOEs.

Contribution to RQ#1. As elaborated in the introduction, literature so far differentiates between private organizations and public administrations, when considering the organizational effects on IT management accounting. Hence, as both publications P1 and P2 show, SOEs have some characteristics regarding IT management accounting that significantly differ from demands of private enterprises' or public administrations' IT management accounting.

Therefore, they need to be considered when analyzing the implementation, use or change of IT management accounting in SOEs. Although, the existing hypotheses that SOEs consist of a mix of characteristics of private organizations and public administrations is not new, the identified characteristics accentuate, that they cannot be considered jointly with private enterprises or, more usual, as a public-sector representative like public administrations when considering (IT) management accounting. Thus, both contributions evince the need for an individual research on (IT) management accounting in SOEs.

Continuing our research on SOEs and their individual characteristics in IT management accounting we recognized, that the characteristic element of organizational objectives supported no evidence for practical relevance in 34 empirical studies analyzed by Boyne (2000). Therefore, we omit this characteristic element in our ongoing research and focus on four theoretically and practically confirmed distinct characteristics of IT management accounting in SOEs.

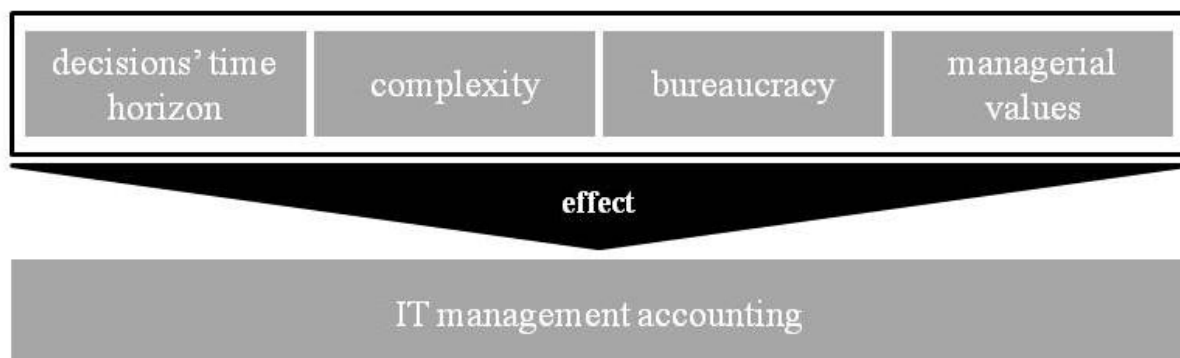


Figure 4: Overview of four key factors influencing the transformation of new ERP systems (Ertl et al., 2014)

Therefore, research question 1 can be answered as follows: the characteristics that distinctly differentiate IT management accounting of SOEs from private enterprises and public administrations are *stability and time horizon of managers' decisions, complex decision-structures, bureaucracy, and managerial values* (s. Figure 4).

RQ#2: Which elements does an organizational transformation framework need to be applied in the SOEs' domain?

Summary of findings in P3. Changes in management accounting have been in the focus of research for many years (Napier, 2006). Though, less attention so far has been paid to how management accounting evolves into what it is, i.e. the continuous process of change that leads to the institutionalization of activities. First, we had to identify a suitable theory for analyzing changes in management accounting. Many existing theories are static and do not consider the dynamic effects of changes driven by the complexity and size of today's enterprises. In contrast to, e.g. the open systems theory, institutional theory focuses on the organizational and cultural drivers within an enterprise. Thus, the institutional theory serves as a suitable starting point for the analysis of changes in the IT management accounting with special consideration of the enterprise's organization, which is considered as a substantial influencing factor for it. To get an assessment of how institutional theory can be applied for the analysis of organizational transformations in IT management accounting in the SOE domain, we used the model of Burns and Scapens (2000) as one representative existing framework.

A German airport that has outsourced its IT department together with another IT provider in a joint venture, was chosen as the research object for the application of the Burns and Scapens model. The model enables a systematic approach to explore the changes in IT management accounting and to identify two success factors in the change process occurred in the analyzed case study.

However, the study shows that the analysis conducted with the Burns and Scapens' (2000) framework cannot be considered alone. The framework misses aspects that influence the research object, e.g. external stakeholders or the attitude of SOE employees. The research object must be seen within the environment of a multi-dimensional context to take account of the social, political and economic influences that also effect the organization or the company (Dillard et al., 2004). Institutional theory enables the interpretation of changes in management accounting and offers the opportunity to recognize possible success factors from the characteristics of the various levels and phases. Though, this first test with the Burns and Scapens' model on management accounting in the SOE domain shows that there is a gap that prevents a comprehensive interpretation of organizational transformations in SOEs.

Summary of findings in P4. Having explored the gaps in the model of Burns and Scapens (2000) regarding its capability to conceptualize the organizational transformation in SOEs, we conducted a comprehensive literature review, to identify further models that deal with organizational changes in organizations. In total, the literature review produced 514 articles, many of which dealt with case studies or the application of specific accounting methods. Of the 514 articles, 19 dealt with theoretical frameworks for organizational transformation. These articles have been further reviewed in detail.

Having identified several concepts, we classified them regarding their basic change theory according to Van de Ven and Poole (1995). They introduced four basic theories to explain the process of change in organizations: life cycle, teleology, dialectic, and evolution (Van de Ven & Poole, 1995). The four theories differ regarding the mode of change, which can be prescribed or constructive, and the unit of change, which can be a single or multiple entity. This classification helped us to identify those frameworks that focus on one single entity (represented by the IT management accounting unit) and a prescribed mode of change (as actively initiated by an outsourcing, insourcing or reorganization project). Due to their focus on one entity and

the prescribed change goals, these frameworks enable a detailed analysis of the effects of planned organizational transformations on the management accounting system (Suddaby et al., 2011; Björck, 2004). Therefore, those six frameworks that are assigned to life cycle theory are highly relevant to the development of a framework for SOEs. To assess the applicability of the chosen six frameworks in an SOE environment, we re-viewed to what extent these frameworks comply with the characteristics of SOEs according to the result of RQ 1.

The result of the requirement-based assessment of existing frameworks shows the lack of an appropriate conceptual framework for organizational transformations in SOEs. None of the existing frameworks meets all four requirements of management accounting change in SOEs as revealed by the first research question. Three of six frameworks fully match two requirements of SOEs (s. Table 3). This leads to the selection of the following three articles as basic elements of the conceptual framework for management accounting change in SOEs: Burns and Scapens (2000), Cunningham and Kempling (2009) and Sharma et al. (2010).

Existing frameworks	Management Accounting Requirements of SOEs			
	1) Dynamic Process Incorporation	2) Stakeholder Integration	3) Detailed Representation	4) Consideration of Public Employees
ter Bogt and van Helden (2000)	-	-	-	(o)
Burns and Scapens (2000)	X	-	X	-
Dambrin et al. (2007)	-	-	(o)	-
Cunningham and Kempling (2009)	-	-	-	X
Dillard et al. (2004)	(o)	(o)	-	-
Sharma et al. (2010)	X	X	-	-
Key: X = Matches with the Requirement (o) = Partial Match with the Requirement - = No Match with the Requirement				

Table 3: Requirement-based evaluation of existing frameworks (cf. Ertl et al. 2018)

After selecting the three relevant frameworks, they must be integrated into a new framework. This combined framework will encompass all demanded characteristics and requirements as identified in RQ1. To ensure a rigor development, we use the punctuated equilibrium model for organizational change (cf. Tushman & O'Reilly, 1996) to integrate the three frameworks. The punctuated equilibrium model proposes two states: one state consists of a long phase of stability, called the equilibrium. The second state describes short periods of revolution, the 'punctuations', fundamentally alter underlying structures and cause qualitative changes.

The equilibrium in Burns and Scapens' (2000) framework is represented by the institutions with defined rules and routines as well as by specified actions. The framework of Sharma et al. (2010) also contains institution as an element to incorporate the state of persistent structures. The state of fundamental change according to Burns and Scapens (2000) is comprised via process reproduction as well as institutionalization, which form the transition into the new institution. The change principles presented by Cunningham and Kempling (2009) also depict the transition phase of a public organization with qualitative changes and, therefore, are assigned to the revolutionary state.

From this punctuated equilibrium model-based integration of the three frameworks emerges the new framework for conceptualizing organizational transformations of IT management accounting in SOEs.

After developing the organizational transformation framework for SOEs, it was applied to a case study. An explanatory qualitative research approach was chosen because an in-depth understanding of factors that cause or overcome transformation barriers in IT departments of SOEs is required to apply the new framework. As research object, a German airport that is majority-owned by a German federal government was selected. The focus of this study draws on business process redesign activities in the IT department. What made the case especially intriguing for our research is that the airport outsourced its IT department several years ago to a joint venture subsidiary together with a company. Thus, the case study partners had in-depth experience in the field of changes in IT management and redesign of business processes.

The application of the new SOE framework shows how the framework allows identification of transformation barriers hidden to management but involved in the organizational change process. The first barrier affects employees. There were not introduced to the new IT strategy, which offered them potential benefits. Hence, it would have been supportive to consider their needs in the change process and to entrust the employees with more challenging and responsible tasks. The second transformation barrier is derived from the framework and concerns the external change stakeholders. The framework shows a lack of integration along the change process. The decoupling of competencies between the change participants would have been helpful in this case to connect them reliably with the commitment plan and to form a stable coalition.

Besides the mentioned transformation barriers, P4 additionally provides two success factors for organizational transformations in IT management accounting of SOEs: (1) combination of the need for change and the stability of the guiding coalition, and, (2) set-up of a new organizational unit implementing new team constellations with enhanced staff competencies and IT know how.

Contribution to RQ#2. Following the identified characteristics of SOEs from P1 and P2 we made a deeper analysis on frameworks for conceptualizing organizational transformations. The application of the Buns and Scapens (2000) model to IT outsourcing in P3 shows that institutional theory sees change as a process with a focus on organizational rules and (work) routines, but beyond that, the overarching social context as well market environment of the company need to be considered. P4 presents the state of the art regarding frameworks on management accounting change and their lack of complying with all characteristics and requirements of SOEs' IT management accounting. Considering the distinct characteristics of IT management accounting (s. RQ#1) as objective measures in the requirements-based evaluation, none of the existing frameworks meets all four requirements of management accounting change in SOEs. Therefore, we used the punctuated equilibrium model to integrate three frameworks, to encompass all necessary elements of management accounting change in SOEs. To answer RQ2, the demanded elements that need to be considered when conceptualizing organizational transformation in the SOEs' domain are described in the following.

The basic elements of the framework are the representation of the institutional realm and the realm of actions. The institutional realm comprises assumptions and habits that govern organizational activities, relationships of the actors, rules and routines. The realm of action follows the specified organizational conditions set by the institutional realm and refers to the execution of management accounting methods. A further element of the framework represents

the integration of external change stakeholders, which is an indispensable requirement for public organizations. There are three types of external change stakeholders that should be differentiated: change agent, external stakeholders, and change manager.

Besides the elements of the basic model of Burns and Scapens (2000) and the external change stakeholders according Sharma et al. (2010), the framework also comprehends the nine assisting change principles as evinced by Cunningham and Kempling (2009). These elements enable to consider attitude and commitment of public employees.

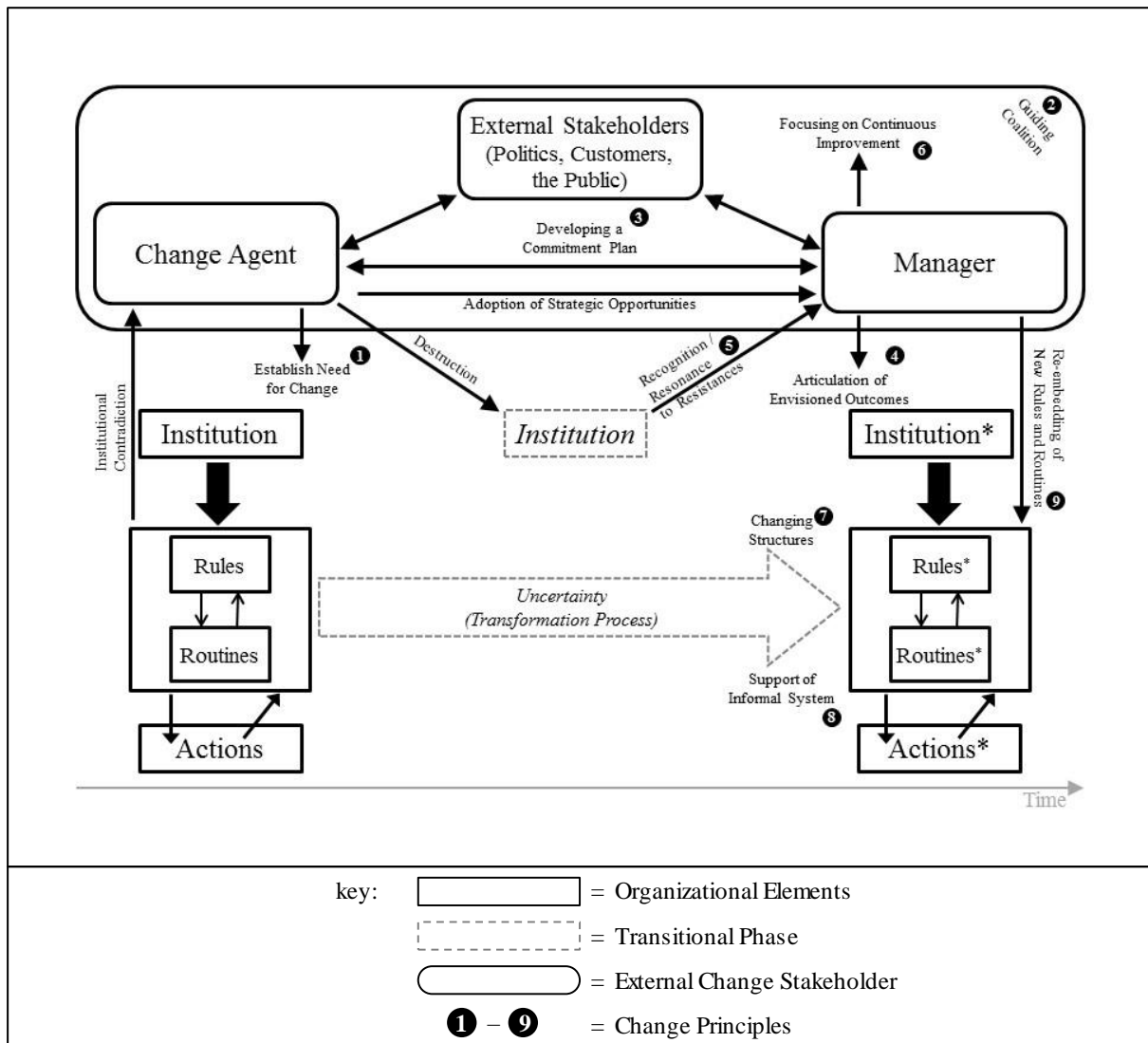


Figure 5: A framework for organizational transformation in IT departments of SOEs (cf. Ertl et al. 2018)

Our developed framework enables a systematic analysis of the organizational transformation along the change process, especially including those stakeholders, which have considerable influence on the successful transformation process (cf. Balta et al. 2015). The comparison of the practical case shown in the framework with the initial framework reveals two empirical transformation barriers which were not identified by the company's experts during the interviews. Thus, the new framework for management accounting change in IT departments of SOEs can determine additional insights from organizational transformations.

With our research we can close a research gap by introducing a framework to conceptualize organizational transformation in IT management accounting of SOEs. The new framework for SOEs also provides an enlarged understanding of institutional theory.

RQ#3: Which further success factors and transformation barriers can be identified in the domain of IT management accounting of SOEs? (RQ#3)

Summary of findings in P5. In addition to the described publications on the theoretical background of the characteristics of management accounting in SOEs (P1 and P2) and the development of a new framework to conceptualize organizational transformations in SOEs based on institutional theory (P3 and P4), the following two publications have an empirical focus.

In P5, the process of introducing activity-based costing was examined at a public company. All interviews in P5 were conducted at a major German airport, which is 100% owned by governmental authorities. Based on six challenges mentioned in literature, the publication analyses to what extent these challenges of IT management accounting in the SOE domain can be overcome. Those six challenges are: lack of transparency regarding the service offering, lack of transparency on operating costs, high individuality of offers, high dependence on the customer, difficult pricing as well as no suitable personnel management and incentive systems. Using two selected IT service management processes, the effects and changes in the organization on the stated six challenges by introducing a new calculation scheme were examined.

The implementation of activity-based costing provided some advantages over the previous surcharge costing. Significant advantages of the activity-based calculation were recognized above all in the quality and validity of the cost management. Costs are recorded in a more differentiated way through activity-based costing, which has a positive effect on internal accounting and the preparation of offers for potential customers. Another advantage is that the key figures generated in the context of activity-based costing enable benchmarking. Thus, the use of process costs can address the challenge of performance audit.

Indirectly, the pricing and competitiveness of the cloud computing provider are also improving. Knowing the actual costs and their composition, the lower price thresholds can be better identified or lowered by lowering process cost rates.

In addition to the identified advantages for IT management accounting, the introduction of activity-based has shown that it can meet the 6 challenges mentioned in the literature. Regarding the first challenge, activity-based costing supports companies in building more transparency in terms of service offerings, provided the organization has a process-based organization. About the lack of transparency of the operating costs, the basic problem is that cost information must be present in cost accounting systems. If this is not the case, the quantities for the activity-based costing must be estimated. No solution could be found for the third challenge. Nevertheless, to illustrate the possibility of individuality using process costing, cloud computer providers can try to build their service portfolio as modularly as possible to be able to offer individual solutions based on standardized processes. Regarding the fourth challenge, all customer requests in this project were considered identical. Custom requests that cannot be handled by standard processes generate similar problems as described in the third challenge.

Regarding pricing, activity-based costing can be used to develop new solutions. Transparency and the knowledge of quantity structures can be used to establish a causal pricing. About the sixth challenge, activity-based costing allows to derive indicators for personnel management and incentive systems and to compare them over time and possibly even across company boundaries.

Applying institutional theory to P5, the publication focused on the advancement of existing rules and routines. The study shows that the initial change idea to implementing process cost accounting could be realized successfully. As major advantage, we could determine the increased validity of cost reports and, resulting from this, an increased credibility of the IT management accounting department. Moreover, the new routine provides additional information for potential benchmarking initiatives, which supports the attitude of employees to contribute to these initiatives.

Summary of findings in P6. P6 provides another empirical study of how management accounting can be improved in SOEs. In comparison to P5, which focuses on one research object, P6 encompasses a broader analysis regarding management accounting of four German airports, which are all representatives of SOEs.

At first, some core characteristics of the airports are described. These characteristics meet with the in P1 and P2 identified organizational characteristics of SOEs. The examined airports have a homogenous customer structure, which focuses on the airlines that operate on the specific airport (s. P2 ‘objectives’). Another characteristic is political influence due to the structure of the stakeholders which are mostly public institutions (s. P2 ‘stability and time horizon’). Also, the analyzed airports have challenges regarding working time and compensation models for airport management, as public compensation structures provide little room for maneuver when negotiating salaries or implementing a performance-oriented incentive system for employees (s. P2 ‘managerial values’). Another aspect in management accounting considers contractual relationships with state authorities including the Federal Police and Customs, which lead to a considerable control effort in the financial and accounting of airports, because the billing of services to authorities may maximally at cost, or if the market costs are lower, to this. This means that a detailed calculation based on actual costs must be made available for each service (s. P2 ‘bureaucracy’). The last organizational characteristic addresses the various tasks, that are executed at the airports management accounting department, e.g. debtor management, accounts payable management, liquidity and receivables management, asset accounting, supervision of trade tax and real estate tax assessments, as well as authority management (s. P2 ‘complexity’).

With these characteristics in mind, we analyzed the tasks of management accounting at the airports and could derive twelve lessons learned. Those lessons learned are clustered into three fields of action: employees, governance and IT-landscape.

Regarding employees we identified three activities. First, the employees should receive additional trainings on the use of the IT systems that encompass the available system functions as well as the efficient handling and integration of airport-specific IT systems. Second, compensation structures should be supplemented by incentive structures and offer employee qualification as one additional mode of compensation. Third, the acceptance of IT systems should be improved by defining concrete responsibilities for driving innovations.

The next field of action addresses governance. One lesson learned is to standardize fee and charge rules. The benefit of a common approach would also result in a reduction of complexity of airport-specific IT billing systems. The results of the study also recommend implementing

uniform account assignment guidelines and checklists. Thus, the coordination effort between specialist departments and management accounting can be significantly reduced. Also, the application of uniform accounting standards for efficient processing of incoming and outgoing invoices is recommended. As a last activity regarding governance, our study advises to introduce process cost accounting (s. also P5) to enable causal cost accounting and targeted control of processes.

The third field of action encompasses the IT-landscape of the airports. There, one lesson learned is to introduce cross-departmental workflows. This allows both the improvement of the requirements for a legally compliant organization, e.g. regarding the signature guideline, as well as a process improvement by avoiding media breaks. These workflows are not limited to cross-departmental data exchange, but may also help to optimize interfaces to non-financial accounting systems, e.g. for customers and suppliers who are connected to a direct data exchange. Based on this technical progress, the proportion of digital incoming and outgoing invoices can be increased. This eliminates manual invoice processing activities. Further, the implementation of a digital archiving system is recommended to enable efficient search functions, e.g. to find archived invoices in complaint handling much faster. The last lesson learned is to introduce consistency filters and automatic quality checks. Thus, missing inputs can be detected and corrected by the user at an early stage.

Contribution to RQ#3. The two publications P5 and P6 provide with their strong empirical view a valuable practical insight into management accounting of SOEs. Regarding RQ3 they contribute two major findings.

First, as indicted in P5, a strong and explicit designation of the initial change idea is crucial. The initial change idea is also one of core elements of the transformation framework (s. P4) as the need for initial change is set as the first change principal. The empirical example demonstrates, how the added value afforded by the initial change idea allows to overcome potential transformation barriers, which may arise e.g. from the additional effort associated with new management accounting instruments. Thus, the importance of this change principle as a success factor for organizational transformations is affirmed by the case study of P5.

Second, P6 contribute to RQ3 with some additional success factors for management accounting in general, but on abstract level, the lessons learned address three fields of action, that are all considered as relevant in the transformation framework (s. P4). The field of governance represents the level of rules and routines in the institutional part of the framework. Beyond, the perspective of public employees is considered. This is also one of the fore core requirements of management accounting of SOEs (s. P4). In addition to regulatory and employee-related recommendations, the IT-landscape of SOEs is also included. One organizational attribute that drives complexity in organizations is IT-landscape (s. P2). Thus, the IT landscape significantly influences the possibilities for designing or further developing management accounting instruments as part of the realm of action (s. organizational transformation framework in P4).

In conclusion, the two publications P5 and P6 contribute to the former mentioned problem statement regarding additional success factors and, especially, practitioners when managing an organizational transformation in IT management accounting of SOEs. The publications evince some innovative and context-specific success factors for further evolving management accounting of SOEs.

4.2 Implications for Research

The doctoral theses on organizational transformations in IT management accounting of SOEs bears several implications for research, including:

- (1) For **institutional theory** in general, we enhance existing theory by integrating additional elements that enable it to conceptualize organizational transformations not only in private enterprises but also in SOEs. The existing structures modelling the process of change and its attention to organizational rules and routines is not restricted by the new elements. Thus, besides its main components like institutions, actions, rules and routines, (old) institutional theory gets supplemented by external change stakeholders and additional elements that represent the attitude of SOE employees.
- (2) The **classification of existing theories and frameworks** on organizational transformations in management accounting according the four basic change theories by Van de Ven and Poole (1995) shows a significant difference in the number of assigned contributions. Whereas single entity theories (life-cycle and teleology theory) constitute 17 of the 19 articles identified by the literature review, multiple entity theories (dialectic and evolution theory) entail only one contribution each. This classification evinces a strong focus on single entity theories in current research. The literature review does not reveal any indications, why multiple entity theories are not as prominent as single entity theories.
- (3) Concerning **organizational characteristics**, our research contributes to a rigor differentiation of private enterprise, public administration and, as a third organizational form, SOE. Thus, further research can use these four distinct elements for enhancing research with focus on SOEs.
- (4) This thesis introduces a new **SOE framework** for conceptualizing organizational transformations in IT management accounting of SOEs. This will help researchers to analyze further case studies in other SOE sectors, to derive other success factors or transformation barriers.

4.3 Implications for Practice

Our research on organizational transformations in IT management accounting of SOEs bears several implications for practice, including:

- (1) A practical example on how to **apply the SOE framework**. This will enable practitioners to use the framework on their own. Thus, they can actively shape the organizational transformation in the (IT) management accounting department according to their individual management requirements.
- (2) Further, the results of this research provide an **enhanced conceptual understanding** of elements and relations in the organizational transformation process itself. Consequently, the framework will help change managers in the field to identify and understand those factors, which influence or will influence their organizational transformation process

- (3) This thesis evinces concrete empirical **success factors and transformations barriers**. These can be used as guidelines and recommendations how to arrange the organizational transformation process based on valid experiences of other SOE managers.

4.4 Limitations

This doctoral thesis is, like any other research project, also subject to some limitations. As a general limitation we recognize the time period of this thesis, which has been written over a period of five years. During this time, our personal understanding of the subject under study evolved as well in respect to the terminology, characteristics, frameworks and theories used. With regard to the applied literature reviews, one major limitation is the complete reliance on previously published research, their availability and qualification. We reviewed literature that has been published in private sector, e-government, information management, and public administration journals and conferences. Though, even we intended to include all pertinent publications, it must be understood that some literature was not found for review in P1, P2, P4 and P6. Further limitations arise from the requirements-based evaluation of existing frameworks on organizational transformations in management accounting. Besides the low number of objective measures, there is also a notable thread to validity through the single person operation of the evaluation process. The process of framework evolution is also subject to certain limitations. The chosen meta model enables a rigorous integration of the three frameworks. Hence, the single elements of the frameworks have to be allocated to the PEM. As there are no guidelines for researchers how to operate this step, this allocation may also contain inconsistencies. Nevertheless, it worked with two case studies. Besides their many advantages for gaining deep insights, the case studies are subject to certain limitations. First, we focused on IT departments of German airports as representatives of SOEs. Thus, the data stems from a limited number of organizations and the reviewed interview and documentary data is confined. The final evolved framework needs further empirical application to ensure generalizability case studies do not allow for generalizations in the conventional sense. The findings of P4 and P6 are limited to the specific domain, to the organizations studied and to the country, where the case studies were conducted. This applies also to the results of the interviews conducted in P5.

4.5 Future Research

Given the results and limitations of this research, it opens up for several potentially areas of future research.

- (1) Upcoming contributions can use this results to **argue on the four specific requirements of management accounting in SOEs** compared to private enterprises and public administrations. These characteristics can be considered not only from an organizational transformation perspective but also from an implementation perspective on management accounting. How do these four characteristics affect the adaptation of management accounting in SOEs?

- (2) Future research could also conduct further case studies in other SOE domains, e.g. in the health or the energy sector, in order to **identify additional success factors and transformation barriers**. With an increasing number of success factors and transformation barriers the risk of a failure in organizational transformation projects can be reduced further. The collection of adequate number of requirements could result in a guidelines library for practitioners.
- (3) The next field deals with the significant lower representation of **multi entity theories**. Why could we identify only one dialectic and one evolution theory? Is there a similar observance in other fields of change theories exceeding management accounting? What may be a reasonable explanations for this?
- (4) Besides the identification of further recommendations based on case studies, this can also be used for a further **evaluation of the framework**. Thus, the three frameworks may rise potential for minor adaptations due to the limitations caused by the integration with the PEM.
- (5) In order to **enhance the understanding of distinct SOE characteristics**, they need to be prioritized in the next step. Therefore, a representative survey with public organization managers would be an appropriate method and reveal the perceived relevance of these characteristics in practice. This additional insight is needed to derive which characteristics researchers should focus on most when conceptualizing IT management accounting in SOEs.

5 CONCLUSION

This doctoral thesis explored the process of organizational transformations of IT management accounting in state-owned enterprises. We determined specific characteristics regarding management accounting of SOEs and identify success factors as well as transformation barriers using a new framework for conceptualizing SOEs organizational transformations. Besides the determined recommendations for the transformation process, the framework also helps to enhance the understanding of the elements and relations in the transformation process itself. With respect to potential generalizability of the framework, some sections of this research indicate, that the results may also be applied in other domains, exceeding the IT domain (s. ‘(IT) management accounting’).

We argue that with this new framework, the increasing number of upcoming organizational transformations in SOEs can be encountered. Thus, this research and the evolved framework make a contribution to the recognition of the importance of SOEs in global economy.

PART B

PUBLICATION 1**Analysis of Different Organizational Forms and Their Effect on Performance Management of IT¹**

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ABSTRACT

Over recent years, performance management of information technology (IT-PM) has been implemented as a management discipline in public organizations. However, many public organizations still face big challenges regarding the usage of IT-PM. One reason for this is their hybrid organizational form. So far, the literature differentiates only between private organizations and public administrations, when taking into account the organizational effect on IT-PM. Public organizations are not taken into consideration. Beside this, almost no research is done on how the characteristics of the three organizational forms affect the way IT-PM is implemented and used. Therefore, the purpose of this contribution is to analyze how the characteristics of organizational forms influence IT-PM. In order to do so, we answered which characteristics occur in the different organizational forms and which effects these characteristics have on IT-PM. A literature review with predetermined search terms is conducted in order to identify the characteristics of the organizational forms. The identified characteristics are compared and analyzed concerning their influence on the usage of IT-PM. Afterwards their effects on IT-PM are discussed. Finally, statements for the successful implementation and use of IT-PM are derived considering the characteristics of the organizational forms. The assumption that public organizations have characteristics of both private organizations and public administrations is affirmed by our findings. The availability of one measurable objective like in private organizations helps to implement IT-PM. However, complex decision-making structures, political influence, no sanction and less benefits mechanisms restrain its successful use and create a tension towards the control function of IT-PM. In conclusion, the characteristics of an organization-al form strongly affect how IT-PM is used. Our contribution enlarges the understanding of IT-PM by differentiating its usage in a particular organizational form. Furthermore, the characteristics of public and private organizations as well as public administrations are compared and the differences are analyzed in detail.

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IT-managers can use the findings to enhance the benefit of IT-PM in their particular organizational form.

1 INTRODUCTION

In the private sector, performance management of information technology (IT-PM) is already used for many years and has a long tradition as a decision-making instrument (Johnson 1983). In the past, many initiatives under the term New Public Management (NPM) tried to transfer performance management (PM) concepts used in the private sector to public administrations (Meier/O'Toole 2011; Diefenbach 2009). However, many public administrations failed to implement and use these concepts successfully. Determining factors in the public sector, like the political influence or the departmental principle, are reasons for this failure. Over recent years, IT-PM has also been implemented in public organizations. However, public organizations still face big challenges regarding the usage of IT-PM, when arranging internal accounting methods with the legal requirements in a regulated market environment (De Lancer Julnes/Holzer 2001).

Public organizations belong to the public sector. In contrast to public administrations, they are more cost effective and ensure economic measurability (Stölting 2001). For our contribution, we define public organizations in a narrow sense as economically and socially oriented organizations which are directly or indirectly subject to a controlling influence by public authorities. Many public organizations originate from the period of privatization, taking place in the 1980s to 1990s - for example hospitals or transportation organizations (Williams/Macintosh/Moore 1990).

So far, the literature differentiates between private organizations and public administrations, when taking into account the organizational effect on IT-PM. Public organizations are not taken into consideration. Further, almost no research is done on how the characteristics of the three organizational forms affect the way IT-PM is implemented and used. A differentiation between public administrations and public organizations is rarely made. The differences between public organizations and public administrations are presented in this contribution.

The purpose of this contribution is to identify and analyze how the organizational form influences the usage of IT-PM. Thus, this contribution is guided by the following research questions:

- Which attributes characterize the different organizational forms?
- Which effects do the different characteristics of the organizational forms have on the usage of IT-PM?

This paper is structured as follows: First, the research methodology is shortly described. Second, the characteristics of the different organizational forms are presented as findings of the literature review. Third, we derive effects on IT-PM by discussing the characteristics of the three organizational forms. Finally, a conclusion is made and further research possibilities are presented.

2 METHODOLOGY

In order to identify the characteristics of the organizational forms, a literature review according to Webster and Watson (2002) was performed. We focused on e-government specific conferences, like FTVI (Fachtagung Verwaltungsinformatik), HICSS (Hawaii International Conference on System Sciences) and IFIP eGOV (International Federation for Information Processing Electronic Government), as well as databases, like Ebsco, Emerald or Springer Link. Table 1 shows the two categories of search terms used in the literature review. The search terms of category 1 were combined with those of category 2 by using and- as well as or-combinations.

<i>Category 1</i>	<i>Category 2</i>
<ul style="list-style-type: none"> ▪ attribute ▪ characteristic 	<ul style="list-style-type: none"> ▪ public sector ▪ private sector ▪ public organization ▪ public administration

Table 4: Search terms for the literature review

Altogether, 60.998 papers were found using these search terms, out of which 38 papers were classified as relevant, as they deal with characteristics of private organizations, public organizations or public administrations. Out of those 38 papers, most papers described the differences between the private and the public sector, but almost no paper compared the characteristics of all three organizational forms in detail.

In order to analyze the characteristics in more depth, we classified them by defining subject-related categories. To ensure a systematic approach for the comparison of attributes, the findings were clustered according to Boyne's four categories (Boyne 2002). After this classification, the attributes were analyzed and discussed and their effects on IT-PM were derived.

3 FINDINGS

A lot of classification schemes for private and public sector organizations exist in the literature. As already mentioned, we used the structure of Boyne (2002). Boyne assigned the attributes of the different organizational forms to four main theoretical effects of publicness: organizational environment, organizational goal, organizational structures and managerial values. He already defined some attributes for these categories. As these attributes do not cover all characteristics which we identified, we extended Boyne's classification with further attributes. If the search turned up only the characteristics of private organizations and public administrations, the characteristic of public organizations was supplemented by using practical experience in a particular public organization.

Table 5 shows the attributes concerning the category organizational environment (Nutt 1999). One attribute are the stakeholders, who place demands and constraints to managers (Mimba/van Helden/Tillema 2007). Public organizations are similar to public administrations, as both are influenced by many stakeholders and are not owned by entrepreneurs or shareholders. The organizational environment can also impact the permeability (Ring/Perry 1985) and stability (Bozeman 1987, Dahl/Lindblom 1953) of organizations and of decision-making. Public

organizations and public administrations are equivalent regarding the attribute permeability, as both organizational forms are influenced by political decisions. The attribute time horizon of IT-managers' decisions needs to be analyzed in more detail. Public as well as private organizations have a long strategic perspective due to their large fixed assets. However, public organizations are indirectly influenced by elections or political decisions, which can cause unpredictable decisions. Considering this political influence, public organizations are similar to public administrations. Thus, public organizations cannot clearly be assigned to private organizations or public administrations regarding this attribute. Another attribute concerning the organizational environment is the performance management force, which represents the perspective of the market and competitors (Boyne 1998). Analyzing this attribute, we noticed that public organizations are similar to private organizations, as both are bounded by the market environment. In addition to these environmental attributes already presented by Boyne (2002), we identified the attributes purchase regulation (Ziomek 2011) and funding (Boyne 2002) as relevant for this category. The characteristics of these two attributes show that public organizations are comparable with public administrations. In sum, the characteristics of public organizations concerning the organizational environment are more similar to those of public administrations – except of the market force by which private organizations are bounded.

	<i>Private organizations</i>	<i>Public organizations</i>	<i>Public administrations</i>
<i>Stakeholders</i>	few stakeholders (Mimba/van Helden/Tillema 2007), ownership by entrepreneurs or shareholders (Nutt 1999, Boyne 2002)	many Stakeholders (Nutt/Backoff 1993)	many stakeholders (Bozeman 1987; Bozeman/ Kingsley 1998; Bozeman/ Scott 1996; Boyne 2002; Mimba/van Helden/Tillema 2007)
<i>Permeability</i>	indirect political influence, influenced by stakeholders (Nutt/Backoff 1993)	political influence (Nutt/ Backoff 1993; Boubakria/ Cosseta/Saffar 2008)	political influence (Bozeman 1987)
<i>Stability and time horizon</i>	strategic decisions fixed for long time periods, sustainable and long term success (Dahl/Lindblom 1953)	long managerial perspective, but short-term decisions, changeable with elections and political appointments (Bryson 2011)	pressure to achieve quick results, instable in decision-making due to political influence and elections (Bozeman 1987, Dahl/ Lindblom 1953; Nutt 1999)
<i>Performance management force</i>	market forces (Bozeman 1987; Boyne 2002)	providing services and products in a regulated market environment (Nutt/Backoff 1993)	no market pressure (Nutt/ Backoff 1993; Nutt 2000), but political forces (Farnham/Horton 1996; Boyne 2002) outputs are not measurable (Bozeman 1987; Boyne 2002)
<i>Purchase regulations</i>	no purchase regulations (Ziomek 2011)	purchase regulations (Ziomek 2011)	purchase regulations (Ziomek 2011)
<i>Funding</i>	private capital (Boyne 2002)	taxation or mix of taxation and private capital	taxation (Boyne 2002)

Table 5: Characteristics concerning the organizational environment

The second category contains attributes associated with organizational goals (Table 6). Primary constraints (Dahl/Lindblom 1953) and the objectives themselves (Bozeman 1987, Farnham/Horton 1996) are important attributes in this category. Public organizations and public administrations have the same or similar characteristics concerning these two attributes. Besides, products (Kuhlmann/Bogumil/Grohs 2008) belong to this category, as products of an organization are strongly linked to its objectives. The organization's customers are an important attribute in this category as well, because all organizations want to satisfy their customers and the customers are related to the organizational goals. Analyzing the attributes products and customers, public organizations have the same characteristics as private organizations, as both have one product and a homogeneous customer structure.

In summary, public organizations are similar to private organizations and public administrations depending on the attribute of this category.

	<i>Private organizations</i>	<i>Public organizations</i>	<i>Public administrations</i>
<i>Primary constraints</i>	economic system (Bozeman 1987)	political system (Carver 2006)	political system (Dahl/Lind-blom 1953; Bozeman 1987)
<i>Objective</i>	<ul style="list-style-type: none"> value maximization as one, measureable goal (Lachman 1985; Farnham/Horton 1996; Greger/Wolf/Krcmar 2013) objectives are clearly defined (Nutt 1999) 	few goals, difficult to prioritize (Nutt/Backoff 1993)	<ul style="list-style-type: none"> public welfare as an overall goal (Mahoney/McGahan/Pitelis 2009; Greger/Wolf/Krcmar 2013) multiple objectives poorly defined, ambiguous, complex and often changing (Bozeman/Scott 1996; Lachman 1985; Bozeman 1987; Nutt 1999; Rainey/Bozeman 2000; Boyne 2002; Mahoney/McGahan/Pitelis 2009; Meier/O'Toole 2011) political objectives (Dahl/Lindblom 1953)
<i>Products</i>	one product (Bozeman/Kingsley 1998, Kuhlmann/Bogumil/Grohs 2008)	one product	many products/services (Bozeman/ Kingsley 1998, Nutt 1999, Kuhlmann/ Bogumil/Grohs 2008)
<i>Customers</i>	<ul style="list-style-type: none"> homogeneous customers consumption voluntary, payment based on use (Nutt/ Backoff 1993) 	<ul style="list-style-type: none"> homogeneous customers funding based on contracts and arrangements (Nutt/Backoff 1993) 	<ul style="list-style-type: none"> citizens as heterogeneous customer group no choice regarding the consumption of services (Nutt/Backoff 1993)

Table 6: Characteristics concerning organizational goals

Table 7 sums up the attributes concerning the organizational structure (Nutt 1999), like the complexity of decision-making (Farnham/Horton 1996; Bozeman/Kingsley 1998; Bozeman/Scott 1996; Kuhlmann/Bogumil, Grohs 2008) and the autonomy of managers regarding managerial competence (Boyne 2002). The characteristics of the complexity of decision-making and autonomy of public organizations are similar to those of public administrations. Both have a complex decision-making structure, rigid hierarchies and a lower managerial autonomy. The complexity is associated with the attribute perspective of performance management (Bozeman/Scott 1996). Comparing the characteristics of this attribute, we noticed that private as well as public organizations are focused on outputs, whereas public administrations focus on inputs. Complementary to the categorization of Boyne (2002), the structure of the information technology- (IT-) landscape was assigned to this category, as the structure of the IT landscape is associated with the organizational structure (Mosse/Whitley 2009). IT-landscapes of public organizations are homogeneous like in private organizations. However, the IT is seen as support function within public organizations and public administrations. In consequence, public organizations have characteristics of both public administrations and private organizations regarding the IT-landscape. Summarizing the findings of the category organizational structure, public organizations have characteristics of both private sector and public administration.

	<i>Private organizations</i>	<i>Public organizations</i>	<i>Public administrations</i>
<i>Complexity of decision-making</i>	<ul style="list-style-type: none"> lean decision structures (Nutt/Backoff 1993, Boyne 2002) process-oriented organization (Nutt/ Backoff 1993, Boyne 2002) low bureaucracy (Nutt/ Backoff 1993, Boyne 2002) 	<ul style="list-style-type: none"> complex decision structures (Bozeman/ Kingsley 1998) rigid hierachies (Boze-man/Kingsley 1998) 	<ul style="list-style-type: none"> complex decision structures (Lachman 1985; Nutt 2006; Bozeman/ Kingsley 1998; Boyne 2002; Brewer/Brewer 2011) rigid hierachies and high bureaucracy (Lachman 1985; Boze-man/Kingsley 1998; Williamson 1999; Boy-ne 2002; Brewer/ Brewer 2011)
<i>Perspective of performance management</i>	focus on outputs (Bozeman 1987)	focus on procedures, rules and outputs (Boyne 2002)	focus on inputs (Boyne 2002; Budding 2004)
<i>Managerial autonomy</i>	<ul style="list-style-type: none"> high managerial auto-nomy (Rainey/Backoff/ Levine 1976) limitations by law or internal consensus (Nutt 1999) 	<ul style="list-style-type: none"> lower managerial auto-nomy (Nutt/ Backoff 1993) limitations by tradi-tional roles (Nutt/ Backoff 1993) 	<ul style="list-style-type: none"> lower managerial auto-nomy of a cross-departmental, central unit (Bozeman 1987; Farnham/Horton 1996) little control over sub-sidiary units (Dahl/ Lindblom 1953)
<i>IT-landscape</i>	<ul style="list-style-type: none"> homogeneous IT as support or core function 	<ul style="list-style-type: none"> homogeneous IT as support function 	<ul style="list-style-type: none"> heterogeneous (Clarkson 1972) IT as support function (Kuhlmann/Bogumil/Grohs 2008) poor understanding of IT value by employees (Wiredu 2012)

Table 7: Characteristics concerning the organizational structure

Table 8 shows characteristics concerning the attitude of managers and employees and its effect on managerial values. This category contains the attributes economic theory of property and rights (Clarkson 1972), sanction and reward mechanisms for employees (Reed 1986; Verbeeten 2008) and organizational commitment of employees (Perry/Porter 1982). Analyzing the managerial values, we noticed that this is the first category in which public organizations have more attributes in common with private organizations, as IT-managers of both are driven by a strong financial motivation and both work with a financial reward system. The main difference to private organizations is that public organizations have less sanction mechanisms. The

organizational commitment with the characteristic medium lies in the middle of private organizations (high) and public administrations (low).

	<i>Private organizations</i>	<i>Public organizations</i>	<i>Public administrations</i>
<i>Economic theory of property rights</i>	strong financial motivation (Boyne 2002)	financial motivation	less materialistic (Boyne 2002)
<i>Sanction mechanism</i>	monetary penalties for underperforming	less sanctions in case of underperforming	less sanctions in case of underperforming
<i>Reward mechanism</i>	financial reward systems (Nutt/Backoff 1993)	financial reward systems (Nutt/Backoff 1993)	less incentives (Rainey/Bozeman 2000; Brewer/Brewer 2011)
<i>Organizational commitment</i>	high, due to strategic decision making and standard procedures (Perry/Porter 1982)	medium, due to many interpretations of action taking (Carver 2006)	low, due to lower job involvement and organizational commitment (Buchanan 1975; Lachman 1985)

Table 8: Characteristics concerning managerial values

4 DISCUSSION

The following section analyzes the identified characteristics regarding their influence on IT-PM and discusses the effects emerging from the different organizational forms. Analyzing the characteristics (Table 5, Table 6, Table 7 and Table 8), we noticed that the assumption that public organizations own a mix of characteristics of private organizations and public administrations can be affirmed. In a more in-depth analysis, we focused on the characteristics influencing the use and success of IT-PM (Schwertsik/Wolf/Krcmar 2009; Greger/Wolf/Krcmar 2013; Chen-hall/Morris 1986).

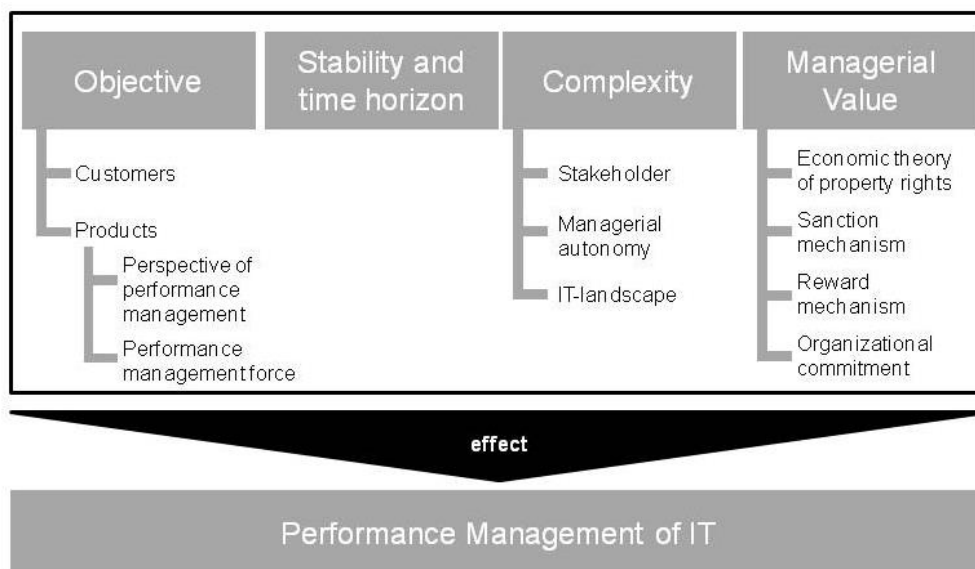


Figure 6: Overview of attributes having an effect on IT-PM

Attributes not influencing IT-PM are excluded from the discussion. The attributes permeability, funding and primary constraints are not classified as relevant, as they only affect the decisions on a high, strategic, corporate management level, but not the implementation or the usage of IT-PM itself, which is on an operative level. Purchase regulations, as the name indicates, ensure compliant procurement processes and decisions, but they are also not related to IT-PM. Beside this small amount of non-relevant attributes, most attributes are classified as relevant. After the analysis of these relevant attributes, we derived four statements and allocated the remaining attributes to those statements. Figure 6 summarizes all attributes effecting IT-PM.

First, the stability and time horizon of IT-managers' decisions influences heavily IT-PM.

The stability and time horizon of IT-managers' decisions can result in short-term instructions or change long-term strategic directions. In order to visualize this components, organizations are able to use business case simulations which are conducted by IT-PM. As private organizations show clear and sustainable strategic decisions, they can focus on one master business case. In contrast, public organizations are influenced by their supervisory board or political surrounding conditions (Nutt/Backoff 1993; Boubakria/Cosseta/Saffar 2008). This requires various business plans for the simulation of the decisions' consequences and the assessment of multiple risks which these decisions can have on the organization. Strong political influence and instable decision-making in public administrations result in a rough budget planning without the need of planning sales volume, cost and revenues. Beside this, the time horizon in public administrations is strongly connected to election cycles (Bozeman 1987, Nutt 1999). The short time horizon also effects IT-PM, because the organizations' objectives - and derived from those also the IT-PM goals- may change after an election.

Second, the complexity of decision-making has a huge effect on the way how IT-PM is used.

Due to complex decision-structures in the public sector, the responsibilities are distributed to various decision-makers (Lachman 1985; Nutt 2006; Boyne 2002; Brewer/Brewer 2011). Consequently, IT-PM cannot easily take actions against for example identified budget deviations, as the various decision-makers need to reach an agreement on a particular action. This interferes the execution of compensation measures. In contrast, the process-oriented and lean structures of private organizations enable their responsible IT-managers to actively compensate budget deviations (Nutt/Backoff 1993, Boyne 2002). Besides, the managerial autonomy contributes to the complexity of decision-making. IT-PM in private organizations needs to consider legal restrictions or internal compliance rules as well as the already mentioned customer and product perspective (Nutt 1999). This concedes a high managerial autonomy, when deciding about methods and measures concerning IT-PM (Rainey/Backoff/Levine 1976). In contrast, IT-managers in public organizations and in public administrations need to consider political decisions and topics of public interest. This can limit the choice of possible measures. High managerial roles in public administrations are often represented by a politician, who pursues his own objectives and makes more political decisions (Farnham/Horton 1996; Lachman 1985). Further, IT-managers in public administrations have to deal with the autonomy of unique departments due to the departmental principle. This makes it difficult to implement an overall IT-PM concept (Schwertsik/Wolf/Krcmar 2009). Therefore, stakeholders of an organization also effect IT-PM. Whereas external stakeholders cannot influence the internal reporting and PM processes, internal stakeholders, especially in public administrations, can influence the way how IT-PM is used (Greger/Wolf/Krcmar 2013). Moreover, the IT-landscape effects IT-PM differently depending on the organizational forms. Private organizations

generally use IT as a support or core function and they try to maximize the homogeneity in the IT-landscape to ensure efficient operations. This improves the execution of IT-PM, by providing decisions supporting data due to integrated IT-systems. The IT-landscape of public administrations is heterogeneous due to various customers and products (Clarkson 1972). Consequently, IT-PM in public administrations struggles poor data quality and complex, manually executed PM methods. Even though IT is seen as a support function in public organizations, the IT-landscape is developed towards a higher homogeneity seeking to lever the same advantages as private organizations (Hoch/Klimmer/Leukert 2005).

Third, the organizational objectives are strongly linked to the IT-PM composition.

According to literature, IT-PM is strongly linked to the organizational objectives. Key performance indicators are derived from the objectives and the measures for achieving these objectives. In private organizations, strategies and objectives are mostly clearly defined and communicated (Nutt 1999), whereas in public administrations clear objectives are missing (Greger/Wolf/Krcmar 2013). This makes designing IT-PM difficult. Further, private organizations have just one measurable objective (Lachman 1985; Farnham/Horton 1996; Greger/Wolf/Krcmar 2013). In contrast to this, public administrations have multiple objectives – depending on each department. This fact makes the measurement of the objectives difficult (Dahl/Lindblom 1953; Bozeman/ Scott 1996). Private organizations need to establish customer- and product-oriented PM-concepts. Contrary to this, public administrations focus on internal cost allocation due to a heterogeneous portfolio of products and customers (Bozeman/ Kingsley 1998). Because of their high conformity to private organizations regarding the expression of these specific attributes, public organizations' IT-PM often shows comparable IT-PM methods. The objectives of an organization are strongly linked to its products and customers, as they are mostly defined in the strategy. As already mentioned, the organizational forms have a different variety of products and customers. However, customers do only influence IT-PM, if there is a need for transparency in the organization. We conclude that the effect of this attribute is relatively small. Products have a bigger effect on IT-PM, if one considers the connection to the attribute PM force and perspective of PM: The effect of the first attribute depends on the organizational form which is analyzed. It influences IT-PM by deriving certain requirements regarding transparency especially for private and public organizations, which sell products in a regulated market environment. Thus, IT-PM needs to provide suitable PM processes and methods to meet the transparency issues. In contrast, public administrations are mostly not influenced by market pressure. Consequently, their focus is on inputs and their outputs cannot be measured. The perspective of PM effects IT-PM differently along the organizational forms. The focus on procedures and rules in the public sector causes extensive guidelines, which need to be considered in IT-PM. As a result of this, IT-PM in the public sector is not as flexible than in the private sector.

Finally, the managerial value of an organization influences the success of IT-PM. The theory of property rights is linked to reward and sanction mechanisms. Employees in private organizations have an interest in IT-PM, as they want to ensure cost efficiency in order to get (monetary) rewards and to avoid sanctions. This behavior is very similar to that in public organizations. In contrast, employees in public administrations have no additional extrinsic motivation because of missing reward and sanction mechanisms. The organizational commitment is higher in private and public organizations than in public administrations. Decisions of employees in the private sector influence the financial success of the organization.

IT-PM can support to achieve this objective. IT-managers see IT-PM as an instrument to measure the achievement of objectives and use it as decision-making instrument.

5 CONCLUSION

This contribution identifies and analyzes the characteristics of private organizations, public organizations and public administrations and derives the effects of these characteristics on IT-PM. The findings of the literature review show that public organizations have characteristics of both private organizations and public administrations. The discussion of the characteristics points out that the characteristics availability of objectives, stability and time horizon of decisions, complexity of decisions and managerial value influence composition, use and success of IT-PM heavily. These characteristics are linked to further characteristics, which also influences IT-PM. The degree of influence on a characteristic varies depending on the organizational form. The occurrence of one measurable objective, as it appears in private organizations, helps to implement IT-PM. However, complex decision-making structures, political influence, no sanction and less benefits mechanisms restrain the successful use of IT-PM and create a tension towards the control function. Particular characteristics of an organizational form affect how IT-PM is used. Finally, this contribution derives four principle statements concerning the effects on IT-PM.

Further research needs to be done concerning the evaluation of these statements and the particular attribute should be analyzed in more depth. The degree of the effect on IT-PM regarding the organizational form should be further analyzed, so that the attributes can be prioritized based on their influence on a particular organizational form.

PUBLICATION 2**Analysis of Different Organizational Forms: Towards a Framework of Influencing Factors Regarding Performance Management of IT in Public Organizations²**

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ABSTRACT

Many public organizations still face big challenges regarding the use of performance management of information technology (IT-PM). We assume that one reason for this is the fact that they have characteristics of both the private and the public sector. So far, the literature differentiates only between private organizations and public administrations when taking into account the organizational effects on IT-PM. Public organizations are not taken into consideration. Besides, almost no research is done on how the characteristics of the three organizational forms affect the way IT-PM is implemented and used. We aim at designing a framework containing the influencing factors regarding IT-PM especially for public organizations. We base this framework on four major organizational attributes (objectives, stability and time horizon, complexity and managerial values) derived from the characteristics of IT-PM. In order to identify further influencing factors aligned with the organizational attributes, we enlarge the framework by findings of an additional literature review with a focus on the public sector. The assumption that public organizations have characteristics of both private organizations and public administrations was affirmed by the findings. We identified bureaucracy as an additional relevant organizational attribute. The other influencing factors were affirmed by the literature review. Our analysis presents a revised framework of organizational attributes and influencing factors regarding IT-PM in the public sector. Thus, it extends its understanding by differentiating its use in a particular organizational form. Public IT managers can use the findings to enhance the benefits of IT-PM and focus on relevant factors for its implementation, use and adaptation.

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1 INTRODUCTION

Performance management of information technology (IT-PM) has already been used in the private sector for many years and has a long tradition as a decision-making instrument (Johnson 1983). In the past, many initiatives under the term New Public Management (NPM) tried to transfer performance management (PM) concepts used in the private sector to public administrations (Meier and O'Toole 2011; Diefenbach 2009). However, many public administrations still fail to implement and use these concepts successfully. Determining factors in the public sector, such as the political influence or the departmental principle, can be seen as reasons for this failure. In recent years, IT-PM has also been implemented in public organizations. However, public organizations still face big challenges regarding the use of IT-PM when arranging internal accounting methods with the legal requirements in a regulated market environment (De Lancer Julnes and Holzer 2001).

Public organizations belong to the public sector. In contrast to public administrations, they are more cost effective and ensure economic measurability (Stölting 2001). For our contribution, we define public organizations in a narrow sense as economically and socially oriented organizations which are directly or indirectly subject to a controlling influence by public authorities. Many public organizations originate from the period of privatization which took place in the eighties and nineties - for example of hospitals or transportation organizations (Williams, Macintosh and Moore 1990).

So far, the literature differentiates between private organizations and public administrations, when taking into account the organizational effect on IT-PM. Public organizations are rarely taken into consideration. Almost no research is done on how the characteristics of these three organizational forms affect the way IT-PM is implemented and used. As a starting point for this, Ertl et al. (2014) compared the characteristics of private organizations, public organizations and public administrations. The authors derived a framework with organizational attributes and associated influencing factors which have an effect on IT-PM. However, they have not analyzed whether there are further influencing factors regarding IT-PM especially in public sector literature. Hence, the current paper aims at enlarging the existing framework to include influencing factors which are related to the special determining factors of the public sector. Therefore, it is guided by the following research questions:

- Which organizational attributes and influencing factors affect IT-PM in public organizations?
- Which additional influencing factors can be determined regarding implementation and use of IT PM especially in the public sector?

This paper is structured as follows: chapter 2 presents the organizational attributes and associated influencing factors of the different organizational forms as well as the derived framework for public organizations. These findings are already presented in Ertl et al. (2014). The methodology for a further in-depth analysis of the influencing factors in the public sector is described in chapter 3. Chapter 4 elaborates the influencing factors regarding IT-PM in the public sector as findings of the literature review. In chapter 5, we adapt the framework presented in chapter 2.2 with the determining factors in the public sector. Therefore, we compare the additionally identified influencing factors resulting from the literature review with the

organizational attributes of the basic framework and discuss the adapted framework. Finally, a brief conclusion is drawn and further possible research areas are presented.

2 THEORETICAL BACKGROUND

2.1 Comparison of Private Sector, Public Administrations and Public Organizations

We used the structure of Boyne (2002) as a basis in order to classify the characteristics of private organizations, public organizations and public administrations, and extended it by further organizational attributes identified during a literature review. Boyne (2002) assigned the attributes of different organizational forms to four main theoretical effects of publicness: *organizational environment*, *organizational goal*, *organizational structures* and *managerial values*. These findings are already presented in Ertl et al. (2014).

Table 9 shows the organizational attributes concerning the category *organizational environment* (Nutt 1999).

- *Stakeholders* place demands and constraints on managers (Mimba, van Helden and Tillema 2007). Public organizations are similar to public administrations as both are influenced by many stakeholders and are not owned by entrepreneurs or shareholders.
- The organizational environment can impact *permeability* (Ring and Perry 1985) and *stability* (Bozeman 1987; Dahl and Lindblom 1953) of organizations and of decision-making. Public organizations and public administrations are equivalent regarding the *permeability* attribute since both organizational forms are influenced by political decisions.
- The *time horizon* of IT-managers' decisions needs to be analyzed in more detail. Both public and private organizations have a long, strategic perspective due to their large fixed assets. However, public organizations are indirectly influenced by elections or political decisions which can cause unpredictable decisions. Considering this political influence, public organizations are similar to public administrations. Thus, public organizations cannot clearly be assigned to private organizations or public administrations regarding this attribute.
- The *performance management force* represents the perspective of the market and competitors (Boyne 1998). Analyzing this attribute, we noticed that public organizations are similar to private organizations, as both are bound by the market environment.
- In addition to these attributes already presented by Boyne (2002), we identified *purchase regulation* (Ziomek 2011) and *funding* (Boyne 2002) as relevant for this category. The characteristics of these two attributes show that public organizations are comparable with public administrations.

In summary, the characteristics of public organizations concerning the *organizational environment* are more similar to those of public administrations – except for the market force by which private organizations are bound.

	Private organizations	Public organizations	Public administrations
<i>Stakeholders</i>	Few stakeholders (Mimba, van Helden and Tillema 2007), ownership by entrepreneurs or shareholders (Nutt 1999; Boyne 2002)	Many stakeholders (Nutt and Backoff 1993)	Many stakeholders (Bozeman 1987; Bozeman and Kingsley 1998; Bozeman and Scott 1996; Boyne 2002; Mimba, van Helden and Tillema 2007)
<i>Permeability</i>	Indirect political influence, influenced by stakeholders (Nutt and Backoff 1993)	Political influence (Nutt and Backoff 1993; Boubakria, Cosseta and Saffar 2008)	Political influence (Bozeman 1987)
<i>Stability and time horizon</i>	Strategic decisions fixed for long time periods, sustainable and long term success (Dahl and Lindblom 1953)	Long managerial perspective, but short-term decisions, changeable with elections and political appointments (Bryson 2011)	Pressure to achieve quick results, instable in decision-making due to political influence and elections (Bozeman 1987; Dahl and Lindblom 1953; Nutt 1999)
<i>Performance management force</i>	Market forces (Bozeman 1987; Boyne 2002)	Providing services and products in a regulated market environment (Nutt and Backoff 1993)	No market pressure (Nutt and Backoff 1993; Nutt 2000), but political forces (Farnham and Horton 1996; Boyne 2002); Outputs are not measurable (Bozeman 1987; Boyne 2002)
<i>Purchase regulations</i>	No purchase regulations (Ziomek 2011)	Purchase regulations (Ziomek 2011)	Purchase regulations (Ziomek 2011)
<i>Funding</i>	Private capital (Boyne 2002)	Taxation or mix of taxation and private capital	Taxation (Boyne 2002)

Table 9: Characteristics concerning the organizational environment

The second category contains organizational attributes associated with *organizational goals* (Table 10).

- *Primary constraints* (Dahl and Lindblom 1953) and the *objectives* themselves (Bozeman 1987; Farnham and Horton 1996) are important attributes in this category. Public organizations and public administrations have the same or similar characteristics concerning these two attributes.

- As *products* (Kuhlmann, Bogumil and Grohs 2008) of an organization are strongly linked to an organization, they also belong to this category. Besides, organization's *customers* are an important attribute in this category because all organizations want to satisfy their customers and the customers are related to the organizational goals. Analyzing the attributes of *products* and *customers*, public organizations have the same characteristics as private organizations as both have one product and a homogeneous customer structure.

In summary, public organizations are similar to either private organizations or public administrations - depending on the attribute of the category *organizational goals*.

	Private organizations	Public organizations	Public administrations
Primary constraints	Economic system (Bozeman 1987)	Political system (Carver 2006)	Political system (Dahl and Lindblom 1953; Bozeman 1987)
Objective	<ul style="list-style-type: none"> Value maximization and business growth as measurable goals (Lachman 1985; Farnham and Horton 1996; Becker, Algermissen and Falk 2009; Jurisch et al. 2012; Obermeier, Wolf and Krcmar 2013; Greger, Wolf and Krcmar 2013) Objectives are clearly defined (Nutt 1999) 	Few goals, difficult to prioritize (Nutt and Backoff 1993)	<ul style="list-style-type: none"> Public welfare and compliance with laws and policies as goals (Mahoney, McGahan and Pitelis 2009; Jurisch et al. 2012; Greger, Wolf and Krcmar 2013) Multiple objectives poorly defined, ambiguous, complex and often changing (Bozeman and Scott 1996; Lachman 1985; Bozeman 1987; Nutt 1999; Rainey and Bozeman 2000; Boyne 2002; Mahoney, McGahan and Pitelis 2009; Meier and O'Toole 2011) Political objectives (Dahl and Lindblom 1953)
Products	One product (Bozeman and Kingsley 1998; Kuhlmann, Bogumil and Grohs 2008)	One product	Many products or services (Bozeman and Kingsley 1998; Nutt 1999; Kuhlmann, Bogumil and Grohs 2008)
Customers	<ul style="list-style-type: none"> Homogeneous customers Consumption voluntary, payment based on use (Nutt and Backoff 1993) 	<ul style="list-style-type: none"> Homogeneous customers Funding based on contracts and arrangements (Nutt and Backoff 1993) 	<ul style="list-style-type: none"> Citizens as heterogeneous customer group No choice regarding the consumption of services (Nutt and Backoff 1993)

Table 10: Characteristics concerning organizational goals

Table 11 sums up the organizational attributes concerning the *organizational structure*.

- The characteristics of the *complexity of decision-making* (Farnham and Horton 1996; Bozeman and Kingsley 1998; Bozeman and Scott 1996; Kuhlmann, Bogumil and Grohs 2008) and *autonomy* (Boyne 2002) of public organizations are similar to those of public administrations. Both have a complex decision-making structure, rigid hierarchies and a lower managerial autonomy.
- *Complexity* is associated with the *perspective of performance management* (Bozeman and Scott 1996). Comparing the characteristics of this attribute, we noticed that private as well as public organizations are focused on outputs, whereas public administrations focus on inputs.
- By way of complement to the categorization of Boyne (2002), the structure of the information technology (*IT landscape*) is assigned to this category because the structure of the *IT landscape* is associated with the organizational structure (Mosse and Whitley 2009). *IT landscapes* of public organizations are homogeneous as they are in private organizations. However, IT is seen as a support function within public organizations and public administrations. In consequence, public organizations have characteristics of both public administrations and private organizations as far as the *IT landscape* is concerned.

Summarizing the findings of the category *organizational structure*, public organizations have characteristics of both private sector and public administration.

	Private organizations	Public organizations	Public administrations
<i>Complexity of decision-making</i>	<ul style="list-style-type: none"> • Lean decision structures (Nutt and Backoff 1993; Boyne 2002) • Process-oriented organization (Nutt and Backoff 1993; Boyne 2002; Jurisch et al. 2012) • Low bureaucracy (Nutt and Backoff 1993; Boyne 2002) 	<ul style="list-style-type: none"> • Complex decision structures (Bozeman and Kingsley 1998) • Rigid hierarchies (Bozeman and Kingsley 1998) 	<ul style="list-style-type: none"> • Complex decision structures (Lachman 1985; Nutt 2006; Bozeman and Kingsley 1998; Boyne 2002; Brewer and Brewer 2011) • Rigid hierarchies and high bureaucracy (Lachman 1985; Bozeman and Kingsley 1998; Williamson 1999; Boyne 2002; Brewer and Brewer 2011; Jurisch et al. 2012) • Consensus between all stakeholders necessary (Obermeier, Wolf and Krmar 2013)
<i>Perspective of performance management</i>	Focus on outputs (Bozeman 1987)	Focus on procedures, rules and outputs (Boyne 2002)	Focus on inputs (Boyne 2002; Budding 2004)
<i>Managerial autonomy</i>	<ul style="list-style-type: none"> • High managerial autonomy (Rainey, Backoff and Levine 1976) • Limitations by law or internal consensus (Nutt 1999) 	<ul style="list-style-type: none"> • Lower managerial autonomy (Nutt and Backoff 1993) • Limitations by traditional roles (Nutt and Backoff 1993) 	<ul style="list-style-type: none"> • Lower managerial autonomy of a cross-departmental, central unit (Bozeman 1987; Farnham and Horton 1996) • Little control over sub-sidiary units (Dahl and Lindblom 1953)
<i>IT landscape</i>	<ul style="list-style-type: none"> • Homogeneous • IT as support or core function 	<ul style="list-style-type: none"> • Homogeneous • IT as support function 	<ul style="list-style-type: none"> • Heterogeneous (Clarkson 1972) • IT as support function (Kuhlmann, Bogumil and Grohs 2008) • Poor understanding of IT value by employees (Wiredu 2012)

Table 11: Characteristics concerning the organizational structure

Table 12 shows characteristics concerning the attitude of managers and employees and their effect on *managerial values*. This category contains the attributes of *economic theory of property and rights* (Clarkson 1972), *sanction and reward mechanisms* for employees (Reed 1986; Verbeeten 2008) and *organizational commitment* of employees (Perry and Porter 1982). Analyzing the managerial values, we noticed that this is the first category in which public organizations have more attributes in common with private organizations since IT-managers of both are driven by a strong financial motivation and both work with a financial reward system. The main difference to private organizations is that public organizations have less sanction mechanisms. The organizational commitment with the characteristic of *medium* lies in the middle of private organizations (high) and public administrations (low).

	Private organizations	Public organizations	Public administrations
<i>Economic theory of property rights</i>	Strong financial motivation (Boyne 2002)	Financial motivation	Less materialistic (Boyne 2002)
<i>Sanction mechanism</i>	Monetary penalties for underperforming	Less sanctions in the case of underperforming	Less sanctions in the case of underperforming
<i>Reward mechanism</i>	Financial reward systems (Nutt and Backoff 1993)	Financial reward systems (Nutt and Backoff 1993)	Fewer incentives (Rainey and Bozeman 2000; Brewer and Brewer 2011)
<i>Organizational commitment</i>	High, due to strategic decision making and standard procedures (Perry and Porter 1982)	Medium, due to many interpretations of action taking (Carver 2006)	Low, due to lower job involvement and organizational commitment (Buchanan 1975; Lachman 1985)

Table 12: Characteristics concerning managerial values

2.2 Framework for Organizational Attributes affecting IT-PM

The following section analyzes the identified organizational attributes in terms of their influence on IT-PM. Analyzing the organizational attributes (Table 9, Table 10, Table 11 and Table 12), we noticed that the assumption that public organizations possess a mix of private organizations' and public administrations' characteristics can be confirmed. We focused on the characteristics influencing the use and success of IT-PM. Those attributes which do not influence IT-PM are excluded from the framework. The attributes *permeability*, *funding* and *primary constraints* are not classified as relevant because they affect the decisions on a high, strategic, corporate management level, but not the implementation or the use of IT-PM itself which is on an operative level. As the name indicates, *purchase regulations* ensure compliant procurement processes and decisions, but they are not related to IT-PM. Apart from this small number of non-relevant attributes, most attributes are classified as relevant. Figure 7 summarizes all attributes which affect IT-PM.

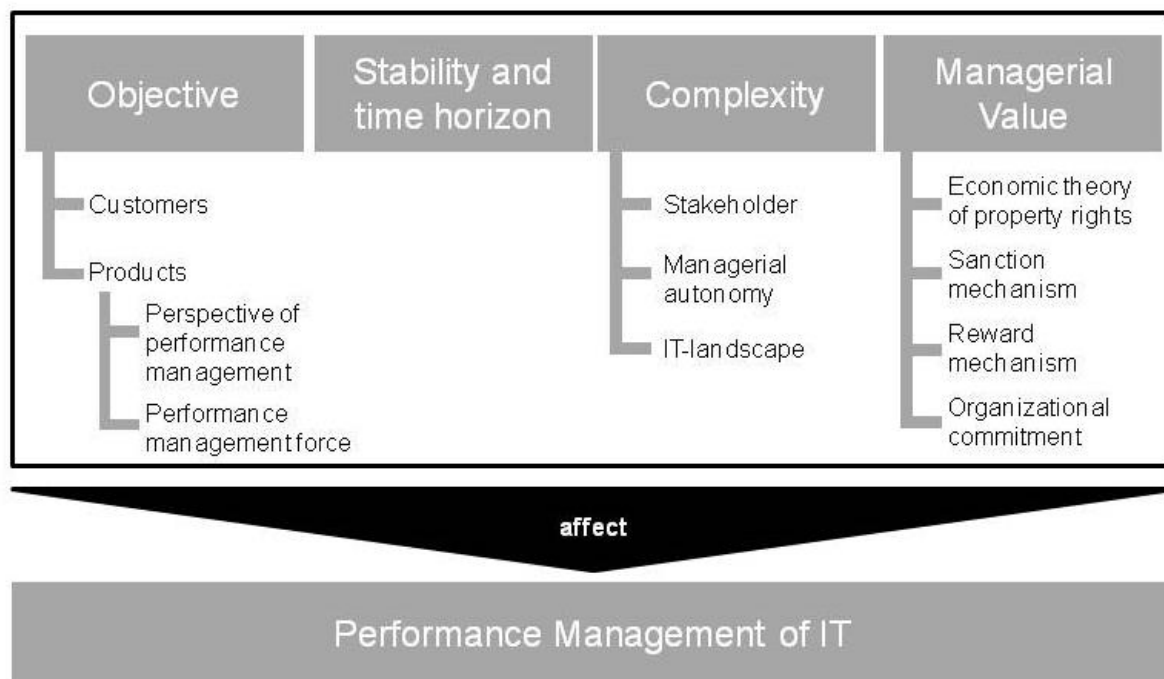


Figure 7: Framework for organizational attributes affecting IT-PM in public organizations

Firstly, the stability and time horizon of IT-managers' decisions greatly influences IT-PM. The stability and time horizon of IT-managers' decisions can result in short-term instructions or change long-term strategic directions. In order to visualize these components, organizations can use business case simulations which are conducted by IT-PM. As private organizations show clear and sustainable strategic decisions, they can focus on one master business case. By contrast, public organizations are influenced by their supervisory board or political surrounding conditions (Nutt and Backoff 1993; Boubakria, Cosseta and Saffar 2008).

This requires various business plans for the simulation of the consequences of the decisions and the assessment of the multiple risks which these decisions can have on the organization. Strong political influence and instable decision-making in public administrations result in rather rough budget planning without the need to plan sales volume, cost and revenues. Additionally, the time horizon in public administrations is connected to election cycles (Bozeman 1987; Nutt 1999). This short time horizon affects IT-PM because the objectives of the organization - and therefore the IT-PM goals - may change after an election.

Secondly, the complexity of decision-making has a huge effect on the way IT-PM is used. Due to complex decision-making structures in the public sector, the responsibilities are distributed over various decision-makers (Lachman 1985; Nutt 2006; Boyne 2002; Brewer and Brewer 2011). Consequently, IT-PM cannot easily take action against budget deviations, for example, because various decision-makers need to agree on a particular action. By contrast, the process-oriented and lean structures of private organizations enable their responsible IT-managers to actively compensate budget deviations (Nutt and Backoff 1993; Boyne 2002). The managerial autonomy also contributes to the complexity of decision-making. IT-PM in private organizations needs to consider legal restrictions or internal compliance rules as well as the customer and product perspective (Nutt 1999). This concedes a high level of managerial autonomy when deciding about methods and measures concerning IT-PM (Rainey, Backoff and

Levine 1976). Contrary, IT managers in public organizations and in public administrations need to consider political decisions and topics of public interest. This can limit the choice of possible measures. High-ranking managerial roles in public administrations are often assumed by politicians who pursue their own objectives and make more political decisions (Farnham and Horton 1996; Lachman 1985). Furthermore, IT managers in public administrations need to deal with the autonomy of departments due to the departmental principle. This complicates implementing an overall IT-PM concept (Schwertsik, Wolf and Krcmar 2009). Therefore, stakeholders of an organization also affect IT-PM. Whereas external stakeholders cannot influence the internal reporting and PM processes, internal stakeholders, especially in public administrations, can influence the way IT-PM is used (Greger, Wolf and Krcmar 2013). Analyzing the IT landscape, we noticed that private organizations mostly use IT as a support or core function and they try to maximize the homogeneity in the IT landscape to ensure efficient operations. This improves the execution of IT-PM by providing decisions supported by data due to integrated IT systems. The IT landscape of public administrations is heterogeneous due to various customers and products (Clarkson 1972). Consequently, IT-PM in public administrations struggles with poor data quality and with complex, manually executed IT-PM methods. Even though IT is seen as a support function in public organizations, the IT landscape is developed towards a higher homogeneity, seeking to lever the same advantages as private organizations (Hoch, Klimmer and Leukert 2005).

Thirdly, the organizational objectives are strongly linked to the IT-PM composition.

According to the literature, IT-PM is strongly linked to the organizational objectives, since key performance indicators are derived from the objectives. In private organizations, strategies and objectives are mostly clearly defined and communicated (Nutt 1999), whereas clear objectives are missing in public administrations (Greger, Wolf and Krcmar 2013). This makes designing IT-PM difficult. Furthermore, private organizations have just one measurable objective (Lachman 1985; Farnham and Horton 1996; Greger, Wolf and Krcmar 2013). By contrast, public administrations have multiple objectives, depending on each department, which makes it difficult to measure the objectives (Dahl and Lindblom 1953; Bozeman and Scott 1996). Private organizations need to establish customer- and product-oriented PM concepts. Public administrations focus, however, on internal cost allocation in view of the heterogeneous portfolio of products and customers (Bozeman and Kingsley 1998). Because of the great correlation with private organizations in terms of expressing these specific attributes, IT-PM of public organizations has comparable IT-PM methods. The *objectives* of an organization are strongly linked to its *products* and *customers* because they are mostly defined in the strategy. *Customers* do only influence IT-PM if there is a need for transparency in the organization. We conclude that the effect of this attribute is relatively small. *Products* have a larger effect on IT-PM if one considers the connection to the attribute of *PM force* and *perspective of PM*: The effect of the first attribute depends on the organizational form which is analyzed. It influences IT-PM by deriving certain transparency requirements especially for private and public organizations which offer products in a regulated market environment. Thus, IT-PM needs to provide suitable PM processes and methods to solve transparency issues. By contrast, public administrations are usually not influenced by market pressure. Consequently, their focus is on inputs and their outputs cannot be measured. The *perspective of PM* affects IT-PM differently depending on the organizational form. The focus on procedures and rules in the public sector requires extensive guidelines which need to be considered in IT-PM. Hence, IT-PM in the public sector is not as flexible as in the private sector.

Finally, the managerial value of an organization influences the success of IT-PM. The theory of property rights is linked to reward and sanction mechanisms. Employees in private organizations have an interest in IT-PM because they want to ensure cost efficiency in order to get rewards and to avoid sanctions. This behavior is similar to that in public organizations. By contrast, employees in public administrations have no extrinsic motivation in the absence of reward and sanction mechanisms. The organizational commitment is higher in private and public organizations than in public administrations. Decisions of employees in the private sector influence the financial success of the organization. IT-PM can provide support to achieve this objective. IT-managers see IT-PM as an instrument to measure the achievement of objectives and use it as decision-making instrument.

3 METHODOLOGY

Based on the framework for influencing factors regarding Performance Management of IT, we conducted a literature review according to Webster and Watson (2002) in order to deepen the understanding of influencing factors especially in the public sector. We focused on peer-reviewed journals as well as e-government specific conferences. Both journals and conferences were classified as relevant if their name indicated that they deal with information management, IT-PM or issues of the public sector. Our search terms can be categorized into three categories:

- Category 1: performance measurement, performance management, cost-benefit-analysis, evaluation, management accounting
- Category 2: IT, information system
- Category 3: government, public sector, public administration, e-government, NPM

The search terms of the different categories were combined by using ‘and’ and ‘or’ combinations. In a first step, we found 583 papers. After abstract and title scanning, we identified 197 papers which dealt with IT-PM. We read these papers and searched for influencing factors. We defined influencing factors as determining factors which influence the implementation and use of IT PM (Greger and Wolf and Krcmar 2013). In order to structure the identified influencing factors, they are aligned with the four attributes of the existing framework.

4 FINDINGS

Table 13 summarizes the findings of the literature review. The influencing factors identified in the literature review are aligned to the attributes of the existing framework.

Attribute	Influencing factors
Objectives	<ul style="list-style-type: none"> • Availability of objectives (Berman and Wang 2000; De Lancer Julnes and Holzer 2001; Yang and Hsieh 2007; Rantanen et al. 2007; Hoque 2008; Yetano 2009; Greger, Wolf and Krcmar 2013)
Stability and time horizon	<ul style="list-style-type: none"> • Acceptance at politics (Berman and Wang 2000; Yang and Hsieh 2007; Maruccio and Steccolini 2009; Taylor 2009; Greger, Wolf and Krcmar 2013) • Political environment (Kuhlmann, Bogumil and Grohs 2008; Yetano 2009; Padovani, Yetano and Orelli 2010; Greger, Wolf and Krcmar 2013).
Complexity	<ul style="list-style-type: none"> • Organizational size (Maruccio and Steccolini 2009; Greger, Wolf and Krcmar 2013) • Organizational form (Schwertsik, Wolf and Krcmar 2009; Greger, Wolf and Krcmar 2013) • Access to information and performance management data (De Lancer Julnes and Holzer 2001; Greger, Wolf and Krcmar 2013) • Technical support for collecting and analyzing IT-PM data (Berman and Wang 2000; Rantanen et al. 2007; Taylor 2011; Greger, Wolf and Krcmar 2013) • Availability of resources like time, budget or employees (Berman and Wang 2000; De Lancer Julnes and Holzer 2001; Melkers and Willoughby 2005; De Vries 2007; Taylor 2009; Greger, Wolf and Krcmar 2013)external stakeholders (De Lancer Julnes and Holzer 2001; Yang and Hsieh 2007; Greger, Wolf and Krcmar 2013) • External requirements (De Lancer Julnes and Holzer 2001; Yetano 2009; Greger, Wolf and Krcmar 2013)
Managerial values	<ul style="list-style-type: none"> • Acceptance at management (Berman and Wang 2000; Ter Bogt and Van Helden 2000; Cavalluzzo and Ittner 2004; Melkers and Willoughby 2005; Yang and Hsieh 2007; Rantanen et al. 2007; Padovani, Yetano and Orelli 2010; Taylor 2011; Greger, Wolf and Krcmar 2013) • Organizational culture (Pina, Torres and Yetano 2009; Greger, Wolf and Krcmar 2013) • Performance of an organization (Maruccio and Steccolini 2009; Greger, Wolf and Krcmar 2013) • Availability of a cultural change (Taylor 2011, Greger, Wolf and Krcmar 2013) • Skills of employees regarding IT-PM (Cavalluzzo and Ittner 2004; Maruccio and Steccolini 2009; Greger, Wolf and Krcmar 2013) • Presentation of benefits to the stakeholders (Lapsley and Wright 2004; Taylor 2011; Greger, Wolf and Krcmar 2013)

Table 13: Influencing factors regarding IT-PM in the public sector

Regarding the organizational attribute *objectives* we identified one influencing factor in the literature review that complies with this attribute. This influencing factor comprises the issue that objectives in the public sector are mostly missing or, if there are objectives, these are stated in a very vague way. This matches with the prior findings on the influencing factors of public administrations.

Further influencing factors can be assigned to the organizational attribute *stability and time horizon*. The results of the literature review contain influencing factors with a wider and external view. We argue that the acceptance at politics and the political environment have fundamental influence on the direction and the duration of a manager's decisions.

The influencing factors of the organizational attribute *complexity* consist of some typical influencing factors, like the organizational form, the organizational size and the availability of resources like time, budget or employees. These three factors directly increase the complexity of an organization and affect IT-PM. Besides, internal technical aspects have influence on IT-PM because they influence the ability to process long term forecasts or business cases. Complexity in IT-PM at public organizations also rises due to limited access on relevant management data as well as the obsolete technical support for collecting and analyzing this data. In addition to these direct influencing factors, a further indirect influencing factor could be identified. Especially in public organizations, external requirements generated by various stakeholders may have a severe impact on internal processes and communication rules that influence the complexity of IT-PM.

The literature review also determined some influencing factors that correspond with the organizational attribute *managerial values*. Besides the monetary influencing factors which are already part of the framework, the literature review revealed some factors with intrinsic influence, like the presentation of benefits to stakeholders or the acceptance at management. Other influencing factors deal with the culture of the organization itself and its ability to change based on the motivation and the attitude of public organizations employees. The employees' attitude and, corresponding to that, the ability to change influence the implementation and further development of IT-PM. This is often linked with a lack of appropriate skills regarding IT-PM resulting in uncertainty on the employees' site and directly affects the performance of an organization.

Besides the above mentioned influencing factors we identified three influencing factors which we could not assign to the organizational attributes of the framework. The first influencing factor derives from laws, rules and regulations (Lapsley and Wright 2004; Modell, Jacobs and Wiesel 2007; Hoque 2008; Maruccio and Steccolini 2009; Yetano 2009; Greger, Wolf and Krcmar 2013) with which public organizations must comply. Strict and formal internal requirements (De Lancer Julnes and Holzer 2001; Yang and Hsieh 2007; Greger, Wolf and Krcmar 2013) are established from this. The third influencing factor are the dedicated internal stakeholders that supervise the execution of these processes (De Lancer Julnes and Holzer 2001; Yang and Hsieh 2007; Greger, Wolf and Krcmar 2013). All of those three influencing factors comprise the formal procedures for decision making and consequently the reduced flexibility of internal processes. This results in a high bureaucracy in public organizations.

5 DISCUSSION

Two major conclusions can be determined after aligning the results of the literature review on public sector influencing factors with the organizational attributes of the framework presented in chapter 2.2. Firstly, the additional literature review confirms essential attributes of the framework and adds further influencing factors to these basic attributes. Secondly, the framework does not include an attribute that represents the *bureaucracy* of public organizations, which base on the demand for monitoring and accountability of public sector organizations (Boyne 2002).

The literature review reveals some new influencing factors that supplement the framework based on the different organizational attributes. As described above there are influencing factors that can be aligned with the organizational attribute *objectives*. Hence, these are very specific for public organizations. This was also a result of the analysis of different organizational characteristics in chapter 2.1. Thus, we do not need to change the attributes or influencing factors related to *objectives*.

The incorporation of the attribute *stability and time horizon* in the framework can be extended. The literature review identifies two new influencing factors for this attribute, as political aspects are not explicitly delineated in the framework so far. The attribute *complexity* as represented in the framework shows a high level of alignment with results of the literature review. The influencing factors *external requirements* and *IT landscape*, which encompasses the technical aspects as identified in the literature review, are included in the framework. However, the analysis of the literature review shows that the influencing factor *managerial autonomy*, which was formerly assigned to the attribute *complexity*, does no longer fit to this attribute. As complexity in IT-PM is mainly driven by external requirements, the organization's size and form or the maturity of its IT landscape, the managerial aspect, which has many internal restrictions, does not apply here. Based on the results for the attribute *managerial values*, two new influencing factors are added to the adapted framework. The first one considers the change availability of public sector employees. This aspect was missing in the prior framework as the comparison of the different organizational forms did not consider change aspects within this attribute. Since this influencing factor encompasses the aspect of organizational commitment, the former influencing factor is replaced by the new one. Another additional influencing factor on IT-PM allocated with the attribute *managerial values* takes into account the skills of employees. Now the attribute *managerial values* represents major aspects of public organizations' employees affecting IT-PM.

Furthermore, the literature review yielded three influencing factors which could not be allocated to one of the four existing attributes. We noticed that these newly identified influencing factors can all be assigned to the *bureaucracy* of an organization. This new attribute contains the influencing factors *strict formal internal procedures* and *various internal supervisors*. Besides the additionally identified influencing factors from the literature review, this attribute applies for the inclusion of *managerial autonomy*. Thus, it encompasses all influencing factors that are required in order to comply with the demand for monitoring and accountability in public sector organizations.

Figure 8 finally illustrates the combination of organizational attributes and specific influencing factors affecting IT-PM in public organizations.

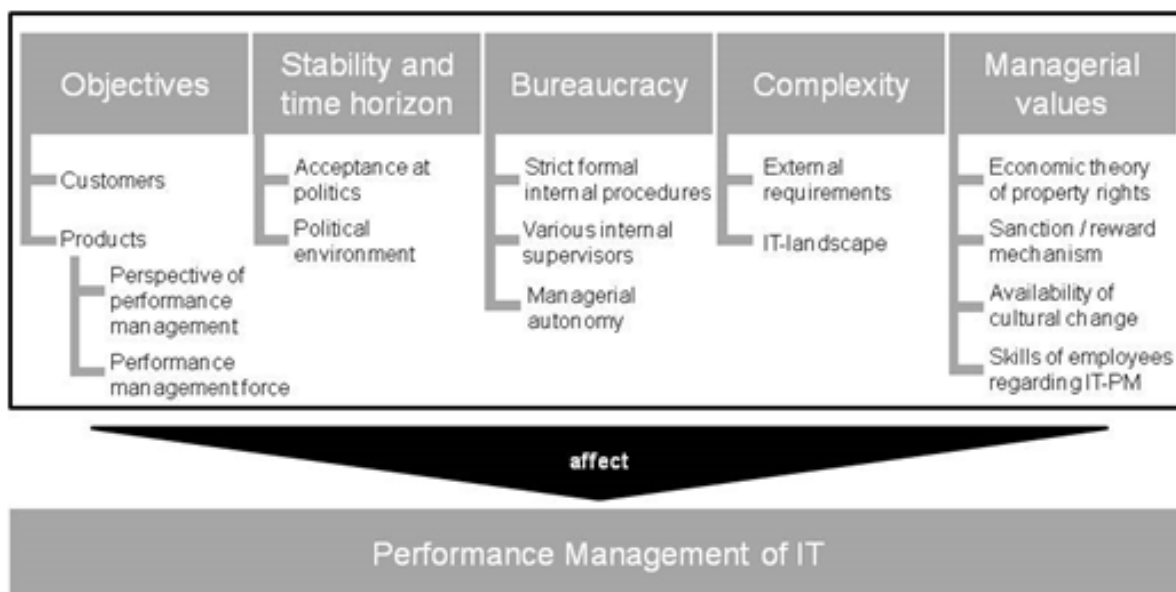


Figure 8: Adapted framework for influencing factors of IT-PM in the public sector

6 CONCLUSION

This contribution revises and extends the framework of influencing factors on IT-PM in public organizations. The attributes of the framework are adapted based on the characteristics of private organizations, public organizations and public administrations and the additional findings of a literature review on influencing factors in the public sector. As a new fifth attribute, bureaucracy is added to the framework. This attribute explicitly represents the formal procedures in public organizations and the strict implementation of laws, rules and regulations. The five organizational attributes (objectives, stability and time horizon, bureaucracy, complexity and managerial values) have a significant influence on IT-PM in the public sector. Hence, they should be considered when analyzing the implementation, use or change of IT-PM.

In order to enhance the analysis of organizational attributes and influencing factors on IT-PM, they need to be prioritized in the next step. Therefore, a representative survey with public organization managers will be conducted. The survey will ask the managers to arrange the influencing factors according to their perceived relevance. This will indicate the different importance of the organizational attributes and influencing factors on IT-PM in public organizations and give an insight as to which attributes and factors researchers should focus on most when analyzing IT-PM in public organizations. Based on this analysis also new recommendations for re-searchers and practitioners in the area of public organizations management can be determined.

PUBLICATION 3

Das Modell von Burns und Scapens am Beispiel der IT-Auslagerung bei einem öffentlichen Unternehmen³

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ABSTRACT

Der kontinuierliche Wandel in Unternehmen führt auch zu Anpassungen im Controlling. Dies betrifft bei IT-Outsourcing Projekten das IT-Controlling. Bisher findet sich noch keine eindeutige Antwort darauf, ob und warum ein solcher Wandel im IT-Controlling gelingt bzw. nicht gelingt. Auf Basis des Modells von Burns/Scapens [1], das einen strukturations-theoretischen Ansatz zur Interpretation von Veränderungen im Controlling ermöglicht, wird der Fall der IT-Auslagerung bei einem öffentlichen Unternehmen untersucht. Die Daten des Praxisunternehmens stammen von einem deutschen Verkehrsflughafen und werden anhand einer interpretativen Fallstudie ausgewertet. Dabei zeigt sich, dass sich das Burns/Scapens Modell für die Interpretation von Veränderungen im IT-Controlling bei öffentlichen Unternehmen eignet und dazu dienen kann, Erfolgs-faktoren im Veränderungsprozess zu identifizieren.

1 EINLEITUNG

Veränderungen im Controlling, seien sie bedingt durch strukturelle Organisations-anpassungen oder den kontinuierlichen Wandel in Unternehmen, sind bereits seit mehreren Jahren im Fokus der betriebswirtschaftlichen Forschung [2]. Viele Beiträge in diesem Forschungsfeld untersuchen, wie sich ein ideales Controlling-System im Kontext der organisatorischen Veränderungen konzeptionell darstellt. Deutlich weniger Aufmerksamkeit wurde bisher darauf gelegt, wie sich das Controlling im Unternehmen zu dem entwickelt, was es ist, also auf den kontinuierlichen Veränderungs-prozess, der zur Institutionalisierung von Tätigkeiten führt [3]. Einen konzeptionellen Ansatz zur Darstellung von Veränderungen im Controlling stellt das Modell von Burns und Scapens [1] dar. Dieses Modell ermöglicht die Beschreibung und Erläuterung grundlegender Abläufe des Veränderungsprozesses im Controlling. Bisher finden sich in der Literatur kaum Beispiele, die das Modell auf praktische Fall-studien anwenden. Eine Ausnahme findet sich bei Herbert/Seal [4]. Sie untersuchten anhand der Daten

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eines privatwirtschaftlichen Energieversorgers in Großbritannien, welche Veränderungen durch das IT-Outsourcing im IT-Controlling entstehen. Im Gegensatz zu Herbert/Seal [4] steht im Fokus dieser Arbeit die Fragestellung, ob sich das Modell ebenfalls für die Interpretation von Veränderungen in öffentlichen Unternehmen eignet. Dazu wird der Fall des IT-Outsourcings an einem deutschen Verkehrs-flughafen herangezogen. Damit sollen folgende Forschungsfragen beantwortet werden:

- Forschungsfrage 1: In wie weit eignet sich das Modell von Burns und Scapens zur Analyse von Veränderungen im IT-Controlling bei öffentlichen Unternehmen?
- Forschungsfrage 2: Ist es mit Hilfe des Modells möglich, die Faktoren zu identifizieren, die einen erfolgreichen Veränderungsprozess im IT-Controlling unterstützen?

Zunächst wird in Kapitel 2 die Theorie der alten institutionellen Ökonomie (old institutional economics) und das von Burns und Scapens entwickelte Modell vorgestellt. Danach wird erläutert, in wie weit sich das Modell als Schema für die Interpretation der Fallstudie hinsichtlich Art und Umfang der organisatorischen Veränderung eignet. Im dritten Teil des Beitrags werden die zugrunde gelegte Forschungsmethodik sowie die Ergebnisse aus der Fallstudie präsentiert. In Kapitel 4 wird untersucht, welche Implikationen sich unter Anwendung des Modells von Burns und Scapens auf das Praxisbeispiel ergeben und ob sich dadurch Eigenschaften identifizieren lassen, die für eine erfolgreiche Implementierung von neuen Controlling-Ansätzen förderlich sind. Abschließend werden die Untersuchungsergebnisse unter Berücksichtigung der Forschungsfragen zusammengefasst und Anregungen für die weitere Forschung auf diesem Gebiet gegeben.

2 THEORETISCHE GRUNDLAGEN

2.1 Veränderungen im Controlling und die Theorie der alten institutionellen Ökonomie

Dieses Kapitel dient dazu, eine kurze Einführung in das Thema organisatorische Veränderungen aus dem Blickwinkel der institutionellen Theorien zu geben und zu erklären, warum das Modell von Burns/Scapens [1] zur Interpretation der Veränderungen im IT-Controlling bei öffentlichen Unternehmen ausgewählt wurde.

Das Thema Veränderung und vor allem die Suche nach Erklärung, wie und warum diese geschieht, ist schon lange ein zentrales Thema in der Forschung [5]. Da die bestehenden Theorien zu statisch sind, um die dynamischen Effekte bei Veränderungen aufgrund der Komplexität und Größe heutiger Unternehmen zu erfassen, haben sich neue Theorien entwickelt [6]. Die Prämisse, dass Veränderungen durch die sozialen und persönlichen Interessen in einem Unternehmen wesentlich beeinflusst werden, führt zur Anwendung der institutionellen Theorie als Grundlage für die Interpretation von organisatorischen Veränderungen. Im Gegensatz z.B. zur Theorie der offenen Systeme (open systems theory), welche die Auswirkungen externer Umwelteinflüsse auf das Unternehmen betont, fokussiert sich die institutionelle Theorie auf die organisatorischen und kulturellen Einflussfaktoren innerhalb des Unternehmens [7]. Nach der Definition von Scott [8] werden bei der institutionellen Theorie die Prozesse betrachtet, die dazu führen, dass sich Regeln, Normen und (Arbeits-) Routinen in der Organisation etablieren und dadurch zum Bestandteil der Institution,

d.h. institutionalisiert, werden. Dieser präziser gefasste Fokus auf die organisatorischen Strukturen eignet sich nach Björck [9] gut dafür, die Veränderungen beim IT-Controlling zu interpretieren, da hier nicht wie bei der Systemtheorie das gesamte Umfeld des IT-Bereichs von der Hardware über die Software bis hin zu den menschlichen Interaktionen betrachtet werden muss. Somit dient die institutionelle Theorie als geeigneter Ausgangspunkt für die Analyse von Veränderungen im IT-Controlling unter besonderer Berücksichtigung der Unternehmensorganisation, welche als wesentlicher Einflussfaktor hierfür angenommen wird. Innerhalb der institutionellen Theorie lassen sich nach Burns/Scapens [1] drei verschiedene Strömungen differenzieren. Aufgrund der im Fokus stehenden Analyse der Veränderungen im IT-Controlling auf Basis von sozialen und organisatorischen Einflussfaktoren werden sowohl die neue institutionelle Theorie als auch die neue institutionelle Soziologie angesichts ihrer abweichenden Sichtweisen im Folgenden nicht weiter betrachtet. Die alte institutionelle Ökonomie bietet die notwendigen Ansatzpunkte, den Veränderungsprozess im Controlling zu strukturieren, und richtet die Aufmerksamkeit auf die organisatorischen Regeln und (Arbeits-) Routinen [1].

Die Hauptbestandteile in der alten institutionellen Ökonomie sind Institutionen, Aktionen, Regeln und Routinen. Institutionen sind Strukturen, welche die für selbstverständlich angenommenen Regeln und das gemeinsame Werteverständnis umfassen sowie die Entscheidungsbefugnisse innerhalb der Organisation festlegen [1]. Diese Regeln dienen dazu, das soziale Verhalten innerhalb der Institutionen einzuschränken, zu kontrollieren bzw. zu unterstützen [9]. Institutionen schaffen die Voraussetzung dafür, dass verschiedene Rollen von Mitarbeitern mit ihren zuständigen Aufgabengebieten, Handlungsbefugnissen und Beziehungen differenziert werden können [1].

Aktionen folgen für selbstverständlich angenommenen Voraussetzungen der Institutionen. Burns/Scapens [1] beschreiben das Verhältnis von Institutionen zu Aktionen wie das Verhältnis von Sprache zu Rede. Über die Sprache werden die gemeinsamen Regeln für die Grammatik, d.h. die Struktur der Sprache, festgelegt, während bei der Rede diese Regeln angewandt und in die Praxis umgesetzt werden.

Zwei weitere Bestandteile der alten institutionellen Ökonomie sind Regeln und Routinen. Regeln umfassen konkrete Verfahrensanweisungen und formale Beschreibungen des Controlling-Systems. Routinen hingegen repräsentieren die aktuell angewandten Controlling-Methoden, also die Ausführung des Controlling-Systems [1]. In der Literatur zur alten institutionellen Ökonomie finden sich zahlreiche Dichotomien, die Einblicke in die Veränderungsprozesse erlauben und die Klassifizierung dieser ermöglichen [1]. Bei Burns/Scapens [1] werden drei Dichotomien, die für Veränderungen im Controlling von besonderer Bedeutung sind, erwähnt und näher beschrieben:

Formelle und informelle Veränderung im Controlling

Formelle Veränderungen sind durch die bewusste Gestaltung bzw. Einführung von neuen Regeln oder Routinen gekennzeichnet [10]. Diese Form der Veränderung wird oft Top-Down in die Organisation eingebracht und durch neue Verfahrensanweisungen und Controlling-Methoden instanziiert [1].

Die informelle Veränderung läuft auf der impliziten Ebene ab. Dabei ersetzen über einen gewissen Zeitraum hinweg neue (Arbeits-) Routinen die bisher angewandten Techniken, ohne dass eine gezielte Veränderung verfolgt wird, alleine aus dem Wiederholen von neuen Prozessschritten [1].

Revolutionäre und evolutionäre Veränderung im Controlling

Während eine revolutionäre Veränderung zu einer grundlegenden Umgestaltung der vorhandenen Regeln und Routinen führt, besitzt die evolutionäre Veränderung einen inkrementellen Charakter und führt nur zu geringen Anpassungen der bestehenden Regeln und Routinen [1]. In der Praxis kann es durchaus vorkommen, dass eine signifikante inhaltliche Änderung der Controlling-Systematik nur eine geringe Auswirkung auf die bestehenden (Arbeits-) Routinen und Strukturen mit sich bringt [1].

Regressive und progressive Veränderung im Controlling

Eine weitere Dichotomie der Veränderung geht auf die Definition von Tool [11] zurück. Er differenziert zwischen dem „zeremoniellen“ Verhalten und dem „instrumentellen“ Verhalten. Das „zeremonielle“ Verhalten zielt darauf ab, bestehende Macht-strukturen zu erhalten, was Tool als regressive Veränderung bezeichnet. Auf der anderen Seite sieht er das „instrumentelle“ Verhalten, das versucht, mit dem besten vorhandenen Wissen bzw. vorhandenen Technologien auftretende Probleme zu lösen. Progressive Veränderungen führen dazu, dass das „zeremonielle“ Verhalten durch „instrumentelles“ Verhalten ersetzt wird, wohingegen regressive Veränderungen zu einer Stärkung des „zeremoniellen“ Verhaltens führen und dadurch institutionelle Veränderungen erschweren [1].

2.2 Das Burns und Scapens Modell

Ein Kritikpunkt in Bezug auf die Interpretation des Wandels im Controlling besteht darin, dass die bisherigen Theorien und Modelle zu statisch und unflexibel sind, um den Veränderungsprozess zu erfassen [6]. Dort knüpft das Modell von Burns/Scapens [1] an: Es betrachtet Veränderungen als Prozess und konzentriert sich auf die organisatorischen Regeln und (Arbeits-)Routinen. Das Modell ermöglicht eine differenziertere Interpretation des organisatorischen Wandels im Controlling durch die Einbindung der (drei) Dichotomien [4]. Abbildung 1 zeigt das Modell von Burns/Scapens [1], welches eine modifizierte Version des von Barley/Tolbert [12] vorgestellten Ansatzes darstellt.

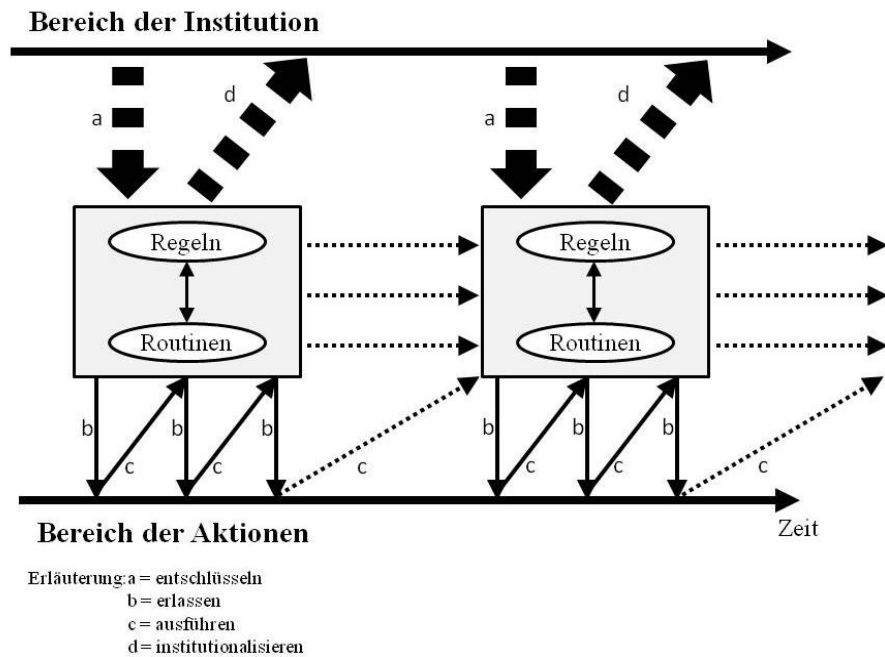


Figure 9: Burns and Scapens (2000) Modell des Veränderungsprozesses

Die von links nach rechts verlaufende Zeitleiste verdeutlicht, dass es immer einen bestehenden ersten Satz von Routinen und Regeln im Unternehmen gibt. Durch den ersten Pfeil (a) wird die Übersetzung von institutionellen Prinzipien in Regeln und Routinen repräsentiert. Im zweiten Prozess (b) erfolgt die Einbindung der Mitarbeiter der Organisation, welche die auf den institutionellen Prinzipien basierenden Regeln und Routinen als Verfahrensanweisungen in die Organisation hineinbringen. Der dritte Pfad (c) symbolisiert die sich wiederholenden Arbeitsabläufe und führt zur Reproduktion der definierten Routinen. Der vierte Pfeil (d) repräsentiert die Institutionalisation von neuen bzw. angepassten Regeln und Routinen, die sich aus dem Arbeitsverhalten der im Prozess tätigen Mitarbeiter entwickelt haben [1] .

Mit Hilfe dieser Prozesse kann der Grad der konzeptionellen Veränderung kenntlich gemacht werden [4] : So kann analysiert werden, wie fundamental die Veränderungen bezogen auf Regeln und Routinen sind und ob diese reproduziert werden (Figure 9, Pfeil c). Sind Veränderungen nachhaltig, werden sie fortan als neue Regeln und Routinen "für selbstverständlich" im Unternehmen wahrgenommen (Figure 9, Pfeil d).

2.3 Anwendbarkeit des Modells und Einschränkungen

Die Theorie der alten Institutionellen Ökonomie ermöglicht durch ihre Charakteristika, Veränderungen im Bereich des IT-Controllings zu untersuchen [9]. Ein Beispiel für die Anwendung des Modells findet sich bei Herbert/Seal [4], die die Auswirkungen der Einführung von IT-Shared Service Centern auf das Controlling anhand eines privatwirtschaftlichen Energieversorgers analysiert haben. Öffentliche Unternehmen hingegen haben die Besonderheit, sich nicht im Wettbewerb mit anderen Unternehmen zu befinden und somit keinem Veränderungsdruck vom Markt ausgesetzt zu sein. Es stellt sich die Frage, wie in diesem Umfeld die Veränderung geschieht und woher die Motivation für den Wandel im IT-Controlling stammt (siehe Forschungsfrage 1).

Durch seinen Fokus auf die grundlegenden Eigenschaften des Veränderungsprozesses liegt der Nutzen des Modells darin, theoretische Konzepte zu beschreiben bzw. zu erklären und diese zur Analyse von interpretativen Fallstudien einzusetzen [1]. Dadurch sollen die Faktoren identifiziert werden, die einen erfolgreichen Veränderungsprozess im IT-Controlling unterstützen (siehe Forschungsfrage 2).

Allerdings gibt es auch einige Einschränkungen bei der Anwendung des Modells zu beachten. Burns/Scapens [1] weisen darauf hin, dass ihr Modell keine operationalisierten Anweisungen für empirische Untersuchungen beinhaltet und nicht dafür gedacht ist, Hypothesen zu testen. Dillard/Rigsby/Goodman [3] bestätigen, dass das Modell von Burns/Scapens einen Einblick in die organisatorische Struktur bietet. Diese Struktur muss aber im Rahmen eines mehrdimensionalen Kontextes gesehen werden, um die sozialen, politischen und wirtschaftlichen Einflüsse berücksichtigen zu können, die ebenfalls Einfluss auf die Organisation bzw. das Unternehmen ausüben [3]. Dieser Einschränkung wird mit dem Ansatz von DiMaggio und Powell [13] entgegnet, die ein Konzept zur Strukturierung von verschiedenen organisatorischen Ebenen entwickelt haben (siehe hierzu Kapitel 4). Durch das Strukturierungskonzept ergibt sich ein weiterer dynamischer Aspekt, der sich auf die Interpretation der Beobachtungen im Rahmen der Fallstudie auswirkt [4].

3 METHODISCHE VORGEHENSWEISE

3.1 Forschungsdesign

Nach der Vorstellung der theoretischen Grundlagen zum Veränderungsprozess im IT-Controlling im vorherigen Kapitel erfolgt nun die Beschreibung der wissenschaftlichen Methodik, welche als Basis zur Datenerhebung und Datenanalyse herangezogen wurde. Diese lehnt sich an die Handlungsempfehlungen von Dubé und Paré [14] bzw. Paré [15] an. Gemäß der Empfehlung von Burns/Scapens [1] wird die Analyse anhand einer interpretativen Fallstudie durchgeführt.

Da das Ziel der Arbeit nicht darin besteht, eine neue Theorie zu formulieren, sondern zu prüfen, ob das Modell von Burns/Scapens [1] zur Analyse der Veränderungen im IT-Controlling bei öffentlichen Unternehmen angewendet werden kann, wird eine Einzelfallstudie durchgeführt. Die Einzelfallstudie ist hierbei angemessen, da sie zur Aufklärung im Rahmen des Theorietests beiträgt [16]. Als Suchstrategie für ein geeignetes Fallbeispiel wurde „intensity sampling“ angewandt [17]. Um als Fallbeispiel gewählt zu werden, muss es sich um ein öffentliches Unternehmen handeln, das über tiefgehende Erfahrungen im Bereich der Veränderungen des IT-Controlling verfügt, damit ausreichend Informationen zum Testen der Theorie gesammelt werden können. Ausgewählt wurde daher ein Flughafenbetreiber, bei dem die Ausgliederung des IT-Bereichs mehrere Jahre zurückliegt.

Mit Bezug auf die in Kapitel 1 vorgestellten Forschungsfragen sind die Instrumente und Aktivitäten des IT-Controllings im Fokus der Untersuchung. Das Untersuchungsobjekt ist die zentrale Controllingabteilung, da hier Erkenntnisse darüber vorhanden sind, welche Veränderungen im Controlling der IT-Leistungen durch die Umorganisation geschehen. Somit passt das gewählte Untersuchungsobjekt im vorliegenden Praxisbeispiel zu den Anforderungen und Anwendungsgrenzen der Theorie von Burns/Scapens [1].

3.2 Datenerhebung

Als primäres Instrument zur Datenerhebung wurde ein semi-strukturiertes Interview verwendet. Um die formulierten Forschungsfragen zu beantworten wurde für das semi-strukturierte Interview ein Fragebogen entwickelt, der 4 Themengebiete abdeckt. Für Forschungsfrage 1 wurden speziell die Themen Struktur des Unternehmens, verwendete Controllinginstrumente und Prozesse sowie der Ablauf und die Erfahrungen des Outsourcing-Verfahrens abgefragt. Zur Datengewinnung für Forschungsfrage 2 diente der Teil Bewertung, welcher speziell auf die Ermittlung von Erfolgs- bzw. Misserfolgskriterien sowie Herausforderungen und Anforderungen an die Steuerung des IT-Bereichs ausgerichtet ist.

Ausschlaggebend bei der Auswahl des Interviewpartners war, dass dieser umfassende Erfahrungen über den gesamten Outsourcingprozess besitzt, über tiefgehendes Fachwissen im Bereich Controlling verfügt und die Veränderungen im IT-Controlling aus einer übergreifenden Perspektive gesamthaft beschreiben und bewerten kann. Dieses reduzierte und fokussierte Vorgehen folgt im Wesentlichen den Charakteristika der homogenen Stichprobenauswahl von Patton [17]. Auf Basis dieser Anforderungen wurde als Interviewpartner der Leiter Controlling der Flughafengesellschaft ausgewählt. Er ist seit rund 20 Jahren im Unternehmen und hat 2004 die Leitung der Controllingabteilung übernommen. Zur Datenerhebung wurde vor Ort ein persönliches Interview mit einer Dauer von 120 Minuten durchgeführt. Inhaltlich umfasst das Interview den Zeitraum vor dem Outsourcing bis zur aktuellen Situation, insgesamt rund sieben Jahre. Dadurch kann der Status des IT-Controllings vor und nach dem Outsourcing sowie der Veränderungsprozess betrachtet werden. Anschließend wurde das aufgezeichnete Interview von zwei Forschern zur Auswertung transkribiert. Aufgrund der hohen Berufserfahrung und der langen Betriebszugehörigkeit können die Informationen aus dem Interview als valide eingestuft werden.

Darüber hinaus konnten Daten aus öffentlich zugänglichen Quellen im Internet generiert werden. Hierzu zählen insbesondere Organigramme, Geschäftsberichte und Leistungsbeschreibungen. Da es sich hierbei um testierte Jahresabschlüsse sowie offizielle Informationen über das Unternehmen bzw. die Tochtergesellschaft handelt, sind diese Informationen ebenfalls als zuverlässig einzuordnen. Diese konnten dazu verwendet werden, die Aussagen des Interviewpartners hinsichtlich der erwähnten Themengebiete nachzuvollziehen und zu prüfen.

3.3 Datenanalyse

Um die Daten aus dem Interview hinsichtlich der originären Fragestellungen beantworten zu können, wurde das Interview codiert. Hierzu wurde zunächst auf Basis der wörtlichen Aussagen eine aggregierte, auf den Inhalt der Aussage beschränkte, Zusammenfassung formuliert. Zur Beantwortung der Forschungsfrage 1 wurden drei Codierungselemente besonders erfasst: Als erstes wurde analysiert, ob der zeitliche Bezug der Antwort vor oder nach dem Outsourcing liegt. Danach wurde das Controlling Instrument innerhalb der Aussage extrahiert. Als dritter Bestandteil wurde eine Zuordnung der Aussage zu dem Modell von Burns/Scapens [1] getätigt. Hinsichtlich Forschungsfrage 2 wurde ebenfalls ein Codierungselement zur Identifizierung der Erfolgsfaktoren eingeführt. Einen Auszug aus der Coding-Tabelle stellt Figure 10 dar.

Nr.	Frage	Antwort (wörtlich)	Antwort (inhaltlich)	vor / nach Outsourcing	Controlling Instrument	Bezug zu Burns/Scapens	Miß-/Erfolgsfaktor
1.6	Welche Berichtsstrukturen gibt im IT Controlling?	Natürlich machen wir auch Abweichungsanalysen. Das monetäre Reporting sowie auch das zentrale Projektmanagement, wo wir dann auch solche Punkte wie Budgetüberschreitungen, das	Durchführung von Abweichungsanalysen, GuV-Reporting und Projektmanagement-Tätigkeiten;	nach	Abweichungsanalysen; GuV-Reporting	Aktivitäten	Mißerfolg / Kostenrisiko: Unvollständige Leistungsverzeichnisse
1.6	Welche Berichtsstrukturen gibt im IT Controlling?	[Aber die IT-Tochter erfasst quasi alle Stunden, die dort erbracht werden, und verrechnet diese dann mit einem Standard-Stundensatz weiter?] Ja, richtig. Wenn die IT-Tochter an diesen Projekten beteiligt bzw.	vor und nach dem Outsourcing: Abrechnung von Projektaufwand nach Projektstunden; früher:	vor	Interne Leistungsverrechnung; Kostenstellenauswertung; Projektstundenverrechnung	Routinen / Aktivitäten	Mißerfolg: Hohe Komplexität der internen Leistungsverrechnung

Figure 10: Auszug aus der Coding-Tabelle auf Basis der Daten aus dem Interview

Nach der Codierung der Informationen in einer Tabelle wurden mittels Datenfilter die jeweiligen Ausprägungen zusammengefasst und in das Modell von Burns/Scapens [1] übertragen (s. Abb. 3).

3.4 Evaluierung der Fallstudie

Um zu evaluieren, ob das vorliegende Praxisbeispiel zur Durchführung einer interpretativen Fallstudie geeignet ist, wird dieses anhand der sieben von Klein/Myers [18] beschriebenen Prinzipien überprüft (s. Table 14).

Prinzip nach Klein/Myers [18]	Ausprägung
Das grundlegende Prinzip des hermeneutischen Zirkels	Die Daten basieren auf einem Interview. Es erfolgt keine Interpretation von Gesprächs- oder Schriftfragmenten. Aus dem Interview werden die getroffenen Aussagen als Eingangsdaten für das Modell verwendet.
Das Prinzip der Kontextualisierung	Die Reflexion des gesellschaftlichen und historischen Hintergrunds beim Praxisunternehmen erfolgt anhand der Strukturierungstheorie von DiMaggio/Powell [13].
Das Prinzip der Verbindung zwischen Forscher und Untersuchungsobjekt	Eine Reflexion, welche Auswirkungen die Interaktionen zwischen Forscher und Interviewpartner auf die Daten haben, ist nicht erfolgt.
Das Prinzip der Abstraktion und Generalisierung	Hierfür wird das Modell von Burns/Scapens [1] mit Fokus auf die Veränderungen im IT-Controlling angewendet.
Das Prinzip der widersprüchlichen Schlussfolgerungen	Die theoretischen Grundlagen der alten institutionellen Ökonomie wurden in Kapitel 2 beschrieben – Widersprüche, die hierzu in der Praxis auftreten, werden in Kapitel 4 vorgestellt.
Das Prinzip der vielen Interpretationsmöglichkeiten	Der Fokus liegt auf dem Interview mit dem Leiter Controlling. Weitere Beteiligte wurden nicht befragt.
Das Prinzip des Verdachts	Die Aussagen des Interviewpartners werden aufgrund der langjährigen Berufserfahrung nicht bezüglich möglicher inhaltlicher „Verzerrungen“ hinterfragt.

Table 14: Evaluierung des Praxisbeispiels in Anlehnung an Klein and Myers (1999)

Obwohl nicht alle Prinzipien vollumfänglich erfüllt werden, kann das Praxisbeispiel für eine interpretative Fallstudie herangezogen werden, da die nur hinreichend erfüllten Prinzipien 6 und 7 durch die modellgestützte Vorgehensweise bei Prinzip 4 wiederum positiv beeinflusst werden [18].

4 ERGEBNISSE DER UNTERSUCHUNG

4.1 Vorstellung der Ergebnisse der Fallstudie

Wie in Kapitel 3 erläutert, wurde als Praxisunternehmen für die Anwendung des Modells von Burns/Scapens [1] ein deutscher Verkehrsflughafen ausgewählt. Mitte des vergangenen Jahrzehnts erfolgte auf Basis einer strategischen Entscheidung die Gründung einer IT-Tochtergesellschaft. Da es sich bei den Flugdaten um sicherheitsrelevante Daten handelt, konnte die IT-Abteilung nicht, wie ursprünglich geplant, voll-ständig ausgelagert werden. So wurde zusammen mit einem weiteren IT-Anbieter ein Joint-Venture gegründet, das seitdem die IT-Versorgung am Flughafen sicherstellt (s. Figure 11).

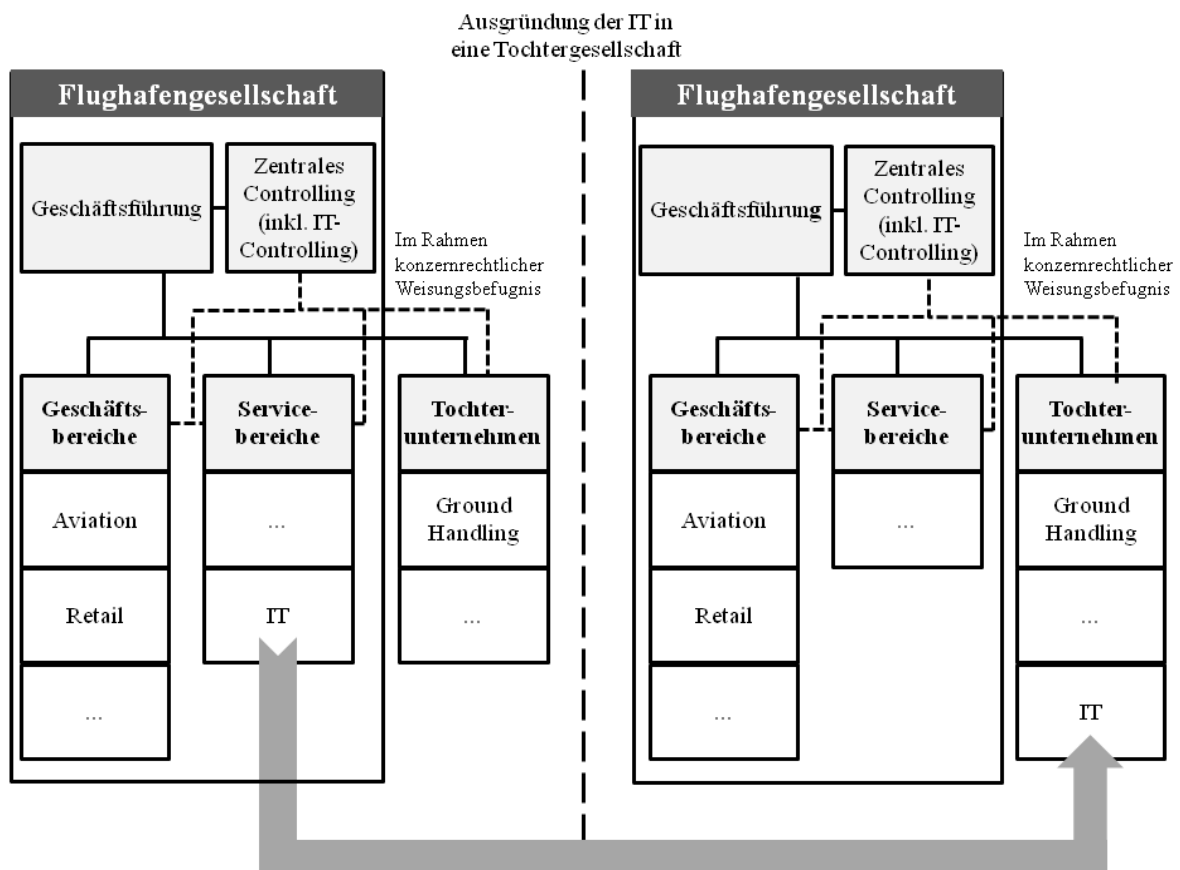


Figure 11: Organisation der Flughafengesellschaft vor und nach dem IT-Outsourcing

Diese neue Organisationsform der IT-Abteilung führte zu einer großen Veränderung im IT-Controlling. Vor dem Outsourcing wurde die IT-Abteilung als intransparenter Kostenblock gesehen. Das IT-Controlling begrenzte sich auf die Daten aus der internen Leistungsverrechnung (ILV), welche durch ein hohes Maß an Komplexität und Intransparenz gekennzeichnet war. Der Interviewpartner beschrieb dies so:

„Wir hatten damals 60 Leistungspositionen und dort gab es auch unterschiedliche Arten der Projektstundenverrechnung. Also gegliedert nach Leiter und auch einfacher operativer Ausführender[...]. Das lief also damals schon differenziert.“

Per ILV wurden den einzelnen Bereichen die IT-Kosten jeden Monat verrechnet. Operativ erfolgte das IT-Controlling anhand von Kostenstellenberichten und der Projektstundenauswertung. Allerdings ist somit nur eine ex-post Analyse der IT-Kosten möglich. Darüber hinaus wurde im Rahmen des Investitionscontrollings versucht, die Neuinvestitionen im IT-Bereich so gering wie möglich zu halten, um einen Effekt auf die langfristigen IT-Kosten über die künftigen Abschreibungen auszuüben. Der zuletzt genannte Aspekt führte unter anderem dazu, dass der IT-Bereich bei Qualität und Effizienz nicht mehr den Zielen der Unternehmensleitung gerecht wurde.

Die Reorganisation des IT-Bereichs zu einer Tochtergesellschaft ging mit neuen Anforderungen an das IT-Controlling einher. Gemäß dem Gedanken der Ausgliederung war zunächst geplant, alle IT-Ressourcen in das Tochterunternehmen zu überführen. Allerdings stellte sich noch während der Outsourcing-Phase heraus, dass weiterhin IT-Fachwissen im Unternehmen selbst benötigt wird, um die fachliche Führung des IT-Dienstleisters und proaktive Steuerung des Outsourcingvertrags gewährleisten zu können. Da die IT-Kosten als externe Kosten in der Gewinn- und Verlustrechnung ankommen und nicht mehr automatisch per ILV in den Verantwortungsbereich der Bereichsleiter einfließen, müssen diese nun über den Rechnungsprüfungsprozess freigegeben werden. Die Beträge in den Rechnungen basieren auf Einheitspreisen für Standardprodukte sowie monatlichen Pauschalen für weitere Dienstleistungen und sind Bestandteil des Outsourcing-Vertrags. Dadurch hat sich die Transparenz in den Kostennachweisen erhöht. Ein weiterer Bestandteil des IT-Controllings neben den monatlichen Abweichungsanalysen sind die Service Level Agreement (SLA-)Reports. Diese werden vom IT-Dienstleister zur Verfügung gestellt und können hinsichtlich der Erreichung der vertraglich geschuldeten Servicequalität überprüft werden. Als wichtige neue Routine im IT-Controlling hat sich das Vertragsmanagement etabliert. Der Interviewpartner erläutert:

„Warum setzen wir diese Instrumente ein: weil man einen bestehenden Vertrag hat, der lebt, der erweitert wird und der über die Jahre gesteuert werden muss. Sowohl von der qualitativen Seite [...] über Service-Level-Agreements, wie auch von der monetären Seite her.“

So können die IT-Kosten aktiv im Rahmen von jährlich stattfindenden Verhandlungen für die kommenden Perioden beeinflusst werden.

4.2 Einordnung der Fallstudie in das Modell von Burns und Scapens

Bevor die Daten aus der Fallstudie auf das Modell von Burns/Scapens [1] angewandt werden, erfolgt zunächst die Einordnung des Praxisunternehmens in den gesellschaftlich-historischen Kontext [3]. Dazu wird die Strukturierungstheorie von DiMaggio und Powell [17] angewandt, welche drei Ebenen unterscheidet:

Die oberste Ebene repräsentiert den übergreifenden gesellschaftlichen Kontext, der sich im wirtschaftlichen und politischen System widerspiegelt. Da es sich bei dem Praxisunternehmen um ein öffentliches Unternehmen handelt, ist dieser Aspekt bei der Interpretation der Ergebnisse zu berücksichtigen. Auf der zweiten Ebene gilt es, das Unternehmensumfeld zu betrachten. Hier ist festzustellen, dass es sich bei einem Flughafen um einen lokalen Monopolanbieter handelt. Dies trifft vor allem auf die IT-Abteilung zu, welche als alleiniger Dienstleister für den Flughafenbetreiber und die dort angesiedelten Drittunternehmen auftritt. Die untere Ebene umfasst die Unternehmensorganisation. Dazu zählen die Bereichsstruktur des

Unternehmens sowie die zugehörigen Tochtergesellschaften. Dieser Teil des Unternehmens – und im vorliegenden Fall der Bereich des IT-Controllings – wird anhand des Modells von Burns/Scapens im Detail analysiert.

Da es sich bei dem Flughafen um ein öffentliches Unternehmen der infrastrukturellen Daseinsvorsorge handelt (erste Ebene), das aufgrund seiner lokalen Monopolstellung keinen direkten Mitbewerbern gegenübersteht (zweite Ebene), war der Druck von Seiten der Gesellschafter auf Effizienz und Innovationskraft gering. Allerdings führten strukturelle Veränderungen im Luftverkehr sowie der Rückzug der öffentlichen Gesellschafter bei der Bereitstellung von Finanzmitteln zu einem Wandel in der Unternehmenssteuerung. Die als Profit Center aufgestellten Geschäftsbereiche mussten wirtschaftliche Renditeziele verfolgen. Dieses Streben nach dem Bereichsoptimum führte dazu, dass alle internen Leistungen, u.a. IT-Leistungen, möglichst niedrige Kosten im Bereich generieren sollten. Aus der Vorgabe nach „minimalen Bereichskosten“ entwickelte sich ein umfangreiches ILV-Monitoring, das operativ über Kosten-stellenberichte und Projektstundenauswertungen erfolgte. Darüber hinaus führte der Gedanke der niedrigen IT-Kosten zu einem strikten Controlling der Neuinvestitionen im IT-Bereich.

Die fehlende Möglichkeit zur Ausgliederung der gesamten IT-Abteilung aufgrund der sicherheitsrelevanten Flugdaten hatte die Gründung einer neuen IT-Tochtergesellschaft unter Beteiligung eines Partnerunternehmens zur Folge. Diese bleibende Verbindung zur IT-Abteilung führt im Zuge der Ausgründung (*formelle, progressive Veränderung*) zu einer Veränderung auf der institutionellen Ebene im Management. Durch den Wandel von der behördenähnlich organisierten, internen IT-Abteilung hin zu einem am Markt agierenden, externen IT-Dienstleister für Flughafen-IT wird sie nun innerhalb des Flughafenkonzerns als „innovativer IT-Dienstleister“ wahrgenommen. Dies entschlüsselt sich in Form von neuen Regeln, die nun ergebnisorientiert statt wie bisher kostenfokussiert sind (*revolutionäre Veränderung*). Durch die Forderung und Förderung innovativer IT-Services stärkt sich die Marktposition der nun externen IT-Abteilung, die dadurch ihre Chancen verbessert, zusätzliches Drittkundengeschäft aufzubauen. Dies wiederum bringt kostensenkende Mengeneffekte mit sich, die sich im Gesamtkonzern sowohl auf das Ergebnis der IT-Tochter als auch auf den Flughafenbetreiber selbst positiv auswirken. Dieses partnerschaftliche Verhältnis hätte sich ohne den Verbleib des IT-Dienstleisters als Tochterunternehmen im Konzern nicht entwickeln können, da ein komplett externes IT-Unternehmen seine eigenen Renditeziele stärker vertreten muss, um am Markt existieren zu können.

Eine wesentliche auf dieser Regel basierende Routine ist das IT-Vertragsmanagement. Im Gegensatz zur bisher dominierenden Routine des ILV-Monitoring ist das IT-Vertragsmanagement im Controlling durch einen hohen Grad an Standardisierung und Transparenz gekennzeichnet. Diese Effekte entstammen vor allem den juristischen Anforderungen an den Outsourcing-Vertrag und dem nun externen Abrechnungsprozess der IT-Dienstleistungen. Als Hauptaktivitäten ergeben sich im Controlling der IT-Dienstleistungen nun das Verhandeln von Vertragsinhalten bzw. Vertragsergänzungen, die Analyse der monatlichen Rechnungen sowie das Monitoring der vereinbarten Servicelevels.

Figure 12 fasst die Ergebnisse der Fallstudie im Modell von Burns/Scapens [1] zusammen:

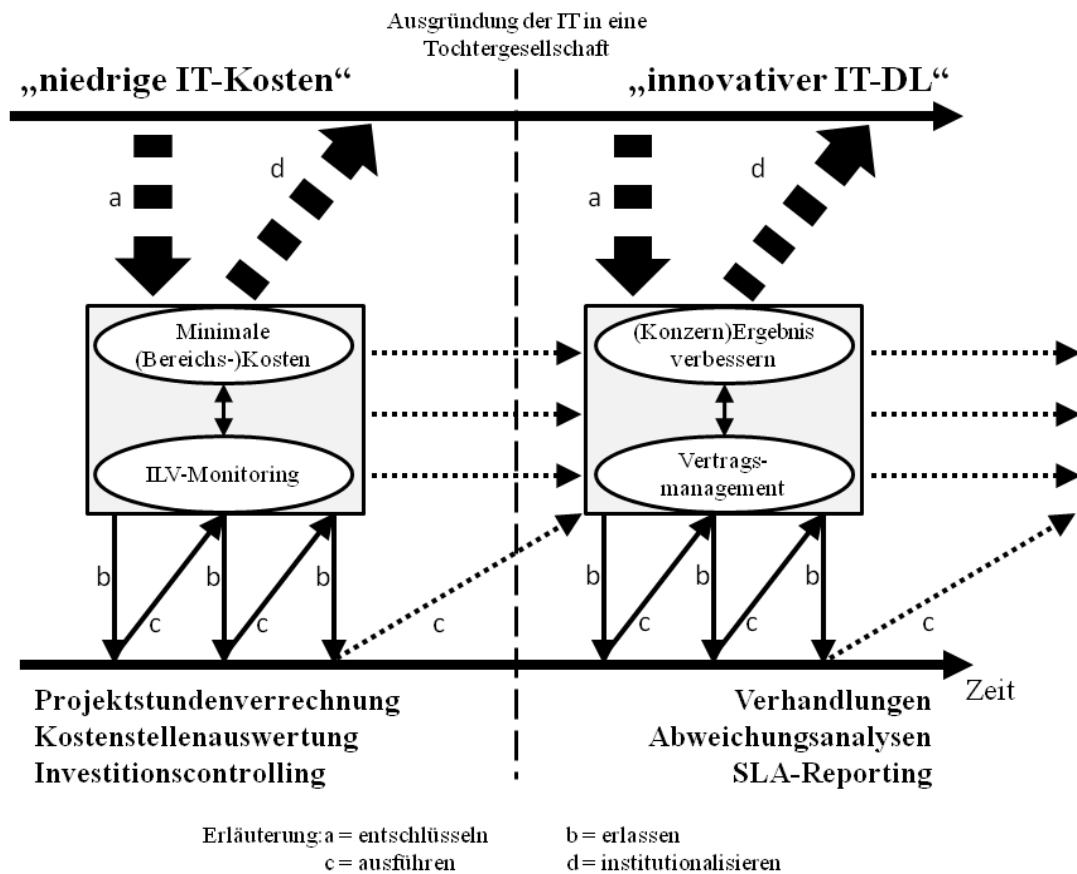


Figure 12: Die Veränderungen im IT-Controlling aus der Fallstudie im Modell

4.3 Implikationen und Analyse der Ergebnisse

Der öffentliche Hintergrund des Unternehmens hätte vermuten lassen, dass sich der fehlende Wettbewerb negativ auf die Notwendigkeit und die Motivation zu Veränderungen im IT-Controlling auswirkt. Wie in Abbildung 3 dargestellt, hat die Ausgründung der IT-Abteilung jedoch zu deutlichen Veränderungen im IT-Controlling geführt. Sowohl auf strategischer (Bereich der Institution) als auch auf operativer Ebene (Bereich der Aktionen) wurden neue Controlling-Ansätze eingeführt.

Ein Erfolgsfaktor, der sich bei der Umstellung gezeigt hat, ist der hohe Grad an standardisierten IT-Leistungen. Die erzielte Standardisierung ist den juristischen Anforderungen an den Outsourcing-Vertrag geschuldet. Dadurch erhält auch das Controlling eine Struktur, welche es ermöglicht, die neuen Routinen gemäß der dort definierten Beschreibung durchzuführen. Die mit der Struktur verbundene Arbeitserleichterung begünstigte die Umstellung der Controllingaktivitäten auf operativer Ebene (s. Pfeil c). Denn das vorher durchgeführte ILV-Monitoring folgte keinen fachlich festgelegten Bestimmungen und ergab sich nur aus den täglichen Routinen.

Ein weiterer Motivationstreiber für den Wandel im IT-Controlling besteht in der Durchführung neuer Aufgaben, welche die Steuerung des Outsourcingvertrags mit sich bringt. Die Aufgaben sind mit zusätzlicher Verantwortung für die Mitarbeiter verbunden. Dazu zählt z.B. die Durchführung von Vertragsverhandlungen mit der IT-Tochter bei Preisanpassungen oder die Vorgabe von Optimierungsvorschlägen für den effizienteren Einsatz von Hardware- und Softwarekomponenten. So kann die Controllingabteilung nun proaktiv den Einsatz von IT-

Dienstleistungen im Rahmen des Outsourcingvertrags steuern. Neben der gestärkten Verantwortung der Controllingabteilung hat die Umstrukturierung des IT-Bereichs auch zu einem qualitätsorientierteren Controlling der IT-Dienstleistungen geführt. Durch die Vereinbarung von verbindlichen Servicelevels werden die Bedürfnisse der Kunden in den Verträgen fixiert und im IT-Controlling nachgehalten. Die Realisierung dieses Erfolgstreibers bedingt, dass ein gewisses Maß an IT-Fachkompetenz im Unternehmen verbleibt.

Die Analyse der Ergebnisse zeigt, dass sich das IT-Controlling im Rahmen der Ausgründung des IT-Bereichs erfolgreich angepasst hat. Einen Beitrag hierzu hat die historische Entwicklung behördenähnlicher Strukturen im IT-Bereich geleistet, welche durch den öffentlichen Gesellschafterhintergrund in Verbindung mit der lokalen Monopolstellung der IT-Abteilung begünstigt wurde. Dies war unter anderem einer der auslösenden Aspekte für die Ausgründung des IT-Bereichs. Unabhängig vom öffentlichen Charakter bzw. den Spezifika des Flughafens sind die zwei identifizierten Erfolgsfaktoren „Controlling-Struktur durch Standardisierung der IT-Leistungen“ und „Veränderung der Aufgabenschwerpunkte hin zu proaktiver Steuerung“, die auch in anderen Unternehmen bzw. Branchen auftreten können.

5 ZUSAMMENFASSUNG UND AUSBLICK

Das Modell von Burns/Scapens [1] hat eine systematische Interpretation der Veränderungen im IT-Controlling am Beispiel des öffentlichen Praxisunternehmens ermöglicht. Festzuhalten bleibt, dass die Analyse der Veränderungen nicht alleine auf Basis des Modells betrachtet werden kann, sondern immer auch der übergreifende gesellschaftliche Kontext sowie das Marktumfeld des Unternehmens bei der Analyse der Ergebnisse berücksichtigt werden müssen. Sind diese Voraussetzungen erfüllt, eignet sich das Modell auch für die Interpretation von Veränderungen bei öffentlichen Unternehmen. Forschungsfrage 1 kann daher positiv beantwortet werden.

Forschungsfrage 2 befasst sich mit der Fähigkeit des Modells, mögliche Erfolgsfaktoren im Veränderungsprozess identifizieren zu können. Im Fallbeispiel können Erfolgsfaktoren aus der Entwicklung vom Ursprungszustand zum neuen Ist-Zustand abgeleitet werden. Diese sind zwar nicht speziell an den Kontext des Unternehmens gebunden, können allerdings auch nicht ohne Einschränkungen generalisiert werden, da jedes Unternehmen eine andere Historie bzw. ein anderes Marktumfeld besitzt. Der strukturationstheoretische Ansatz zur Interpretation von Veränderungen im Controlling bietet die Chance mögliche Erfolgsfaktoren aus den Ausprägungen der verschiedenen Ebenen und Phasen des Modells zu erkennen.

Die Aussagekraft über die hier getroffenen Fähigkeiten des Modells von Burns/Scapens [1] gilt es insofern einzuschränken, dass im vorliegenden Fall dies nur anhand von einem Praxisunternehmen mit einem Interviewpartner untersucht wurde. Um die Validität der Forschungsergebnisse zu erhöhen, sollten noch weitere Praxisbeispiele mittels einer interpretativen Fallstudie am Modell von Burns und Scapens analysiert werden.

PUBLICATION 4**How to Overcome Transformation Barriers in IT
Departments of State-Owned Enterprises⁴**

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ABSTRACT

This paper develops a framework for analyzing organizational change in information technology (IT) departments of state-owned enterprises (SOEs) and applies that framework to a case study of a German airport that is majority-owned by the German federal government. Specifically, we derive a framework from literature to systematically identify transformation barriers for introducing new enterprise resource planning (ERP) systems and business processes in IT departments of SOEs. This framework is based on the punctuated equilibrium model and considers dynamic process incorporation, explicit stakeholder integration, a detailed representation of the change process, and characteristics of public employees as main factors. We then apply the framework in a case study research approach and show how the framework allows identification of transformation barriers hidden to management but involved in the organizational change process (e.g., required change of organizational structures, required change of service-level-agreements). The framework can be a valuable tool for both researchers and practitioners to actively shape the effects of organizational transformation in SOEs and to identify factors that influence the change process.

1 INTRODUCTION

Organizational transformations caused by reorganizing business structures and systems are a frequent event (Ackoff, 2006; Al-Haddad & Kotnour, 2015; Burnes, 2004; Moran & Brightman, 2001). This applies to private enterprises as well as to state-owned enterprises (SOEs), which are directly or indirectly controlled by governmental authorities and can be found in many countries, e.g., Germany, Mexico, and China. Success rates of organizational transformation and system adoption projects in SOEs, however, have been less than 30% for several years (Balogun & Hope Hailey, 2004; Beer & Nohria, 2000; Jacobs, van Witteloostuijn & Christe-Zeyse, 2013; Jansson, 2013).

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Especially for SOEs, which must deal with the presence and interactions of both political and private administrative managers and need to pursue different types of strategies at the same time, e.g., providing public service and obtaining financial independence, organizational transformation projects present additional organizational layers of complexity (Vander Elst & De Rynck, 2014). When referring to literature, one finds that transformation in public organizations does not focus predominantly on organizational but rather on strategic aspects (cf. Kromidha 2012; Vander Elst & De Rynck, 2014), technology-related issues (cf. Cordella & Bonina, 2012; Cordella & Tempini, 2015; Gong & Janssen, 2012; Haahr, 2014; Meier, Ben & Schuppan, 2013; Mergel, 2013; Orlikowski, 1992) as well as the employer's perspective and their individual change process (Meier et al., 2013).

However, little research (cf. Puron-Cid, Gil-Garcia & Luna-Reyes, 2012) has been addressed on organizational transformations in the information technology (IT) department of SOEs. To explore this field of research in a more systematic way, we selected the IT department within SOEs as the object of our research. The IT department is responsible for operating and supporting all necessary IT services for a SOE. Compared to other departments of SOEs, IT departments more likely face organizational transformations caused by increasing initiatives of public private partnerships in the IT sector (Sharma 2012; Da Cruz and Marques 2012), realization of IT outsourcing activities (Joha and Janssen 2010; Cordella and Willcocks 2012) or the upcoming trend of IT insourcing (Damanpour et al. 2013; Warner and Hefetz 2012). With these issues in mind, our work addresses the following research question (RQ):

RQ: How can transformation barriers in IT departments of state-owned enterprises be identified and overcome?

We will answer this research question by deriving a framework for SOEs that enables the analysis of complex interactions between organizational transformations when introducing new enterprise resource planning (ERP) systems and apply this framework in a case study with a German airport. Because many initiatives introducing new ERP systems and processes fail because they do not consider the broader organizational environment (Dillard, Rigsby & Goodman 2004), an integrated approach may be necessary to systematically identify transformation barriers (Al-Haddad & Kotnour, 2015). Thus, we build this framework on the punctuated equilibrium model and on major contributions we identified in literature.

This contribution is structured as follows: In the background section we discuss organizational attributes influencing organizational transformation at SOEs and present an overview of existing frameworks on organizational change. In the third section, we then derive a framework for analyzing the effects of organizational transformations in ERP introduction projects in the IT department of SOEs. Next, we present a case study in which our framework at a German airport is applied. We then present and discuss our findings followed by a short summarization of our research.

2 BACKGROUND

2.1 Characteristics of Organizational Transformation in IT Departments of State-Owned Enterprises

Many contributions in literature can be found showing that organizational transformation projects vary significantly in private and public companies (Boyne, 2002; Nutt & Backoff, 1993). In order to obtain a systematic overview on characteristics of transformation projects in SOEs, Ertl et al. (2014) performed a comprehensive literature review. The composition clearly reveals that organizational change projects in SOEs comprise characteristics of private organizations (e.g., the focus on output performance and a homogeneous group of customers) and other characteristics for public administrations (e.g., political influence and lower managerial autonomy). There are four attributes of the organization to be considered with regard to introducing ERP projects in SOEs (cf. Ertl et al., 2014): *time horizon of managers' decisions, complexity of the decision process, organizational goals, and managerial values of the employees in the management accounting department.*

The first attribute refers to the time horizon of managers' decisions. Based on OECD data, Tarschys (2002) verified that managers in the public sector face the challenge of making short-term decisions and long-term investments. This results from the influence of the supervisory board or political conditions on SOEs (Nutt and Backoff, 1993; Boubakria et al., 2008). Because major decisions of the supervisory board, which is mainly staffed with politicians, can change after an election, the management accounting of SOEs needs to have various business plans at their disposal (Tarschys, 2002).

This influence of the external environment on the organization of SOEs is also reflected in the second attribute, complexity. As the external environment of a public organization is littered with political considerations and thus drives complexity (Nutt, 2006). In contrast to economic issues, which are crucial for private organizations, the views of opinion leaders, legislators and interest groups are of great importance (Levine et al., 1975). As a result, SOEs develop numerous business plans and intricate ways of interaction with key stakeholders in their environment to handle the public influence on their organization (Nutt, 2006).

A third attribute to be considered when introducing projects in SOEs are the organizational goals. Ertl et al. (2014) suggest that procedures and policies based on guidelines and regulations of the public sector should be taken into consideration. Consequently, rules and routines are an integral part to align internal management accounting methods with legal requirements (De Lancer Julnes & Holzer, 2001). Therefore, the initial third attribute, organizational goals, is replaced with the attribute bureaucracy, which describes the need for formalistic procedures of the decision process in the public sector.

The fourth organizational attribute encompasses the managerial values of managers and employees of SOEs departments. Based on empirical studies, Boyne (2002) indicated that managers and employees are less materialistic and show a weaker organizational commitment in comparison to employees of private enterprises, especially start-ups.

Figure 13 summarizes the main factors of a new ERP system and business process transformation for public administrations.

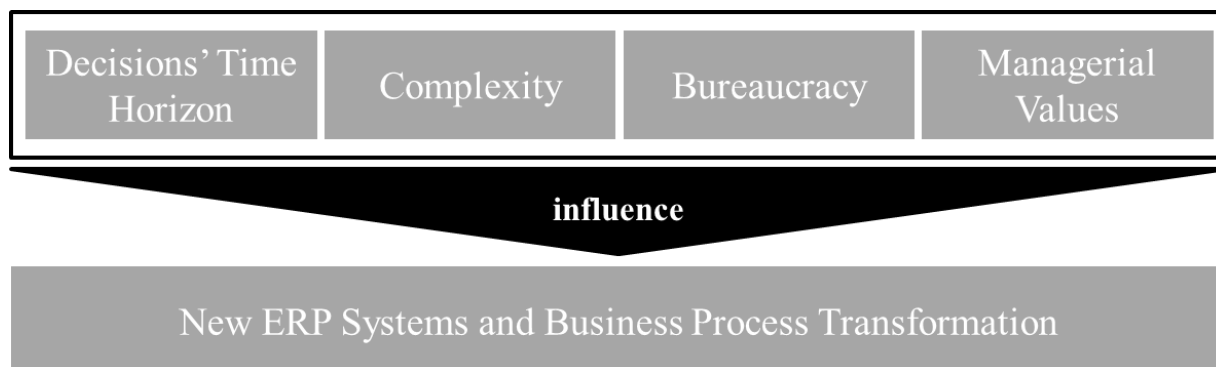


Figure 13: Overview of four key factors influencing the transformation of new ERP systems and business processes (modeled after Ertl et al., 2014)

These four factors need to be incorporated in frameworks to analyze the introduction and transformation of new ERP systems and business processes in IT departments of SOEs.

2.2 Existing Theories and Frameworks for Organizational Change

Organizational transformations encompass individual changes as well as modifications in structures and processes on a corporate level (Kets de Vries & Balazs 1998). A literature review was conducted to identify existing frameworks that analyze the impact of organizational transformations on management accounting systems. The literature review was conducted based on the recommendations of Webster and Watson (2002).

First, we considered where the literature review fits into Cooper's (1988) Taxonomy of Literature Reviews. The aim of the literature review is to analyze current frameworks that conceptualize the impact of organizational transformations on the management accounting system, to criticize and integrate existing frameworks organized in a conceptual way using a neutral view for a general scholar audience and encompassing representative literature (cf. Appendix Table A.1).

Since the focus of this research is the analysis of organizational change when introducing new ERP systems and business processes, the selection of publications is limited to journals in this field. The selection includes major management accounting and public management journals (cf. Appendix Table A.2).

Using online databases we searched the selected journals for the words 'organizational' and 'change' appearing in the search areas abstract, title and keywords. All issues of the selected journals available in the databases were included. Overall, the literature review yielded 514 articles (see Appendix Table A.2); non-relevant articles were excluded. For this purpose, we screened the titles and abstracts of all 514 articles to determine if they complied with the following criteria: 1) the article addressed changes in the management accounting department itself and 2) articles dealing with changes in specific management accounting methods were excluded. Screening for these two criteria yielded 69 useable articles. In a further screening step, all articles containing case study research were excluded because, as described above, the

focus of the research is the identification and evaluation of frameworks in this field. In total, 19 articles were reviewed in detail.

The findings of the literature review are depicted in Table 15. The column 'Basic Theory' refers to the theory applied by the authors to develop their framework. In the next column, a reference is noted if the provided framework is based on the ideas of other authors. The column 'Focus' briefly describes the main idea and concept of the framework. The next columns provide the unit and the mode of change according to the concept of Van de Ven and Poole (1995). The change theory resulting from mode and unit of change is shown in the last column.

Article	Basic Theory	Framework	Focus	Unit of Change	Mode of Change	Change Theory
Abemethy & Brownell (1999)	-	Simons (1990)	Develop a theoretical framework to examine the relationship between strategic change, style of budget use and performance	Single (interactive use of budgets enables the organization to cope better with the change process)	Constructive (relationship between strategic change and performance be enhanced when budgets are used interactively; the model developed here treats budget use as a variable)	Teleology
Ahrens & Chapman (2007)	-	Schatzki (2002)	The role of management accounting in the constitution of organizations; Interrelationships between technical and interpretive accounting processes	Single (the diverse purposes of organisations have on the activities of their members)	Constructive (developing its potential as a structure of intentionality)	Teleology
Applebaum et al. (1998)		Burke & Litwin (1992); Robbins (1993)	Strategic organizational change model: Determinants of change, change agents, change process, organizational elements	Single (organizational change)	Prescribed (model of planned organizational change)	Life-Cycle
Baines & Langfield-Smith (2003)	-	Own structural model	Changing competitive environment; Range of organizational variables as antecedents to accounting change	Multiple (examine the relationships between the changing competitive environment)	Constructive (range of organizational variables as antecedents to management accounting change)	Dialectic
Burns & Scapens 2000	Old institutional theory	Barley & Tolbert (1997)	Describe and explain analytical concepts by a modified framework; Focus on fundamental characteristics of change processes	Single (the "institution" represents one entity)	Prescribed (change or implement new formal management accounting systems as "rules")	Life-Cycle
Cunningham & Kempling 2009	-	Nine principles for changing public sector organizations	Inputs initiating change; Process assisting the implementation; Outcomes illustrating success	Single (a public organization)	Prescribed (importance of establishing a need for change and to create a consensus around this need)	Life-Cycle
Chenhall & Euske 2007	-	Huy (2001)	Rational, systematic practices and the behavioral processes; Idealized intervention types: commanding, engineering, teaching and socializing	Single (integrating an organization's reconstituted values and beliefs with particular rationalities, the external environmental, and social and political forces that affect organizational action)	Prescribed (planned organizational change)	Life-Cycle
Dambrin et al. 2007	New institutional sociology	Hasselbladh & Kallinikos (2000)	Implementation of change processes; Translation of ideas into discourses and control techniques	Single (the management control system of an organization)	Prescribed (a change in the institutional logic of an organisational field)	Life-Cycle
Dillard et al. 2004	Institutional theory; Structuration theory		The role of accounting in the change process	Single (practice of accounting in organizations)	Prescribed (processes associated with creating, adopting and discarding institutional practices)	Life-Cycle
Englund et al. 2011	Structuration theory	-	Ontological basis for theorizing how, when and why socially embedded agents may produce both continuity and change in accounting practices	Single (how and why accounting is mobilized in and transformed through "everyday" organizational life)	Constructive (structuration theory cannot predict human action since actors are knowledgeable and reflexive)	Teleology

Article	Basic Theory	Framework	Focus	Unit of Change	Mode of Change	Change Theory
Hopwood 1987	Multiple theoretical issues	-	Diversity of factors implicated in accounting change; Preconditions for subsequent organisational changes	Single (insight into the organisation)	Constructive (accounting change can shift the preconditions for subsequent organisational changes)	Teleology
Laughlin 1987	Critical theory	-	Social and technical aspects of societal phenomena in accounting systems	Single (seeking to understand and change accounting systems in organizational contexts)	Constructive (seeking to understand and change accounting systems in organizational contexts)	Teleology
Lounsbury 2008		-	Directions and implications for the study of accounting practice; Institutional and micro-processual dynamics	Single (conceptual approach to organizations)	Constructive (how accounting systems shape and are shaped by intra-organizational dynamics)	Teleology
Jones 2005	Darwinian theory	Own framework	Process of replication and learning	Multiple (process of firm transformation)	Prescribed (the role of habits and routines must be outlined in specific detail; Unification)	Evolution
Jayashree & Hussain 2011	Balanced score card	Own framework	Focus on deployment of strategic change = change in strategic / new strategic objectives (change process map)	Single (changes in organizations)	Prescribed (focuses on the use of formal steps such as developing change themes and results, setting change objectives)	Life-Cycle
O'Grady et al 2010		Viable system model (VSM); Performance management and control framework (PMC); Levers of control (LOC)	VSM: used to assess frameworks of control; PMC: 12 Areas with an overall scope of management control (from vision and mission to operative questions); LOC: top down view of organizational control - focus on the control activities of senior management - decisions filter down to all other organizational levels	Single (management control studies typically examine how control systems support the achievement of organizational objectives)	Constructive (interactions with the environment, and the mechanisms for attaining balance between stability and change)	Teleology
Roberts 1994	Socio technical systems design	-	Management accounting from an organizational perspective; Change in the organization design is reflected in and by the MA system	Single (organizational model)	Constructive (how the change in the organization design is reflected in and by the management accounting system)	Teleology
Sharma et al. 2010	Institutional theory	-	Micro-processes and practice changes around TQM implementation	Single (a privatized telecommunication company)	Prescribed (introduction of a management control innovation, total quality management techniques to establish new rules)	Life-Cycle
ter Bogt & van Helden 2000	Institutional theory; Behavioural theory of the firm	Combined framework: Burns & Scapens (2000); Shields & Joung (1989); Cyert & March (1963)	Identify and describe the "development gap" between the ideal concept of accounting change and its ultimate development and the "usage gap" between the developed accounting instruments and their usage in practice	Single (dutch government, public administration)	Prescribed (included actions based on formal procedures, an inward-looking organization, a wait-and-see attitude, and a citizen-focused approach)	Life-Cycle

Table 15: Frameworks analyzing the effects of organizational transformations on the management accounting system

2.3 Classification of Frameworks and Theories

As described in the previous paragraph, 19 articles could be found that correspond to the issue of organizational transformation in IT departments. In order to analyze the focus and limitations of existing frameworks, we draw on the work of Van de Ven and Poole (1995). They introduced four basic theories to explain the process of change in organizations: life cycle, teleology, dialectic, and evolution (Van de Ven & Poole, 1995). The four theories differ regarding the mode of change, which can be prescribed or constructive, and the unit of change, which can be a single or multiple entities.

Group 1 - Life cycle theory: The life cycle theory depicts the process of change in a single entity as progressing through a necessary sequence of prescribed stages (Van de Ven & Poole, 1995). Therefore, all frameworks focusing on a single entity and analyzing intended change in the formal management accounting system are assigned to group 1. In total, nine articles met these parameters: Burns and Scapens (2000); Chenhall and Euske (2007); Dambrin et al. (2007); Sharma et al. (2010); ter Bogt and van Helden (2000); Cunningham and Kempling (2009); Applebaum et al. (1998); Jayashree and Hussain (2011); Dillard et al. (2004). Due to their focus on one entity and the prescribed change goals, these frameworks enable a detailed analysis of the effects of planned organizational transformations on the management accounting system (Suddaby et al., 2011; Björck, 2004). Thus, group 1 is considered as highly relevant for the development of a framework for SOEs.

Group 2 - Teleology theory: Similar to the life cycle theory, the teleology theory focuses on a single unit of change. By contrast, the mode of change is not viewed as a prescribed process; rather it emerges through the purposeful social construction among individuals within the entity (Van de Ven & Poole, 1995). Eight of the 19 articles identified by literature review explain changes in management accounting using a single entity and develop the future state of management accounting changes in a constructive way: Abernethy and Brownell (1999); Ahrens and Chapman (2007); Englund et al. (2011); Hopwood (1987); Laughlin (1987); Lounsbury (2008); Roberts (1994); O'Grady et al. (2010). These articles use interpretive approaches and do not provide a process-oriented framework. Moreover, the integration of environmental effects on organization changes leads to a high and abstract analytical level without the ability to evaluate dynamic processes (Björck 2004), both of which are necessary requirements for analyzing management accounting in SOEs as indicated previously in this chapter. Thus, neither environmental effects nor dynamic processes are considered as a base for the development of an organizational transformation framework on management accounting in SOEs.

Group 3 - Dialectic theory: Unlike the life cycle or teleology theories, the dialectic theory explains the process of organizational development and change in multiple entities. Based on conflicts between entities, a dialectical progression generates this change process (Van de Ven & Poole, 1995). One literature review article meets these parameters: Baines and Langfield-Smith (2003). This article uses external effects, e.g. market or competitor changes as a starting point for the presented framework; this article cannot be used for analyzing changes in SOEs because external effects are not exposed to the pressure of market forces (Bozeman, 2013). Thus, it seems inappropriate to use the external environment as a starting point for accounting change in SOEs.

Group 4 - Evolution theory: The evolution theory comprises a prescribed sequence of variation, selection, and retention events among entities arising from competition for rare environmental resources (Van de Ven & Poole, 1995). Thus, it explains change for multiple entities, like the dialectic theory, and proceeds through a continuous cycle to explain strategy making within organizations. The paper presented by Jones (2005) fits this basic theory. However, the multi-entity basis of this theory does not enable the analysis of an organizational transformation and its effect on management accounting because it focuses on strategy development. As a result, it misses a detailed representation of management accounting processes inside an organization (Suddaby et al., 2011).

There is high diversity in the approaches regarding the theoretical foundation as well as the level of analysis, ranging from a broad strategic or external perspective to a detailed internal view. Moreover, many different types of frameworks are applied to describe accounting change as a life cycle, teleological, dialectic, or evolutionary process. As discussed at the beginning of this section, the four theories differ regarding the mode of change and the unit of change. The combination of these two parameters determines which theory should be applied to explain the change process in the organizational entities.

As the assessment of the four groups shows, only life cycle theories provide an applicable approach for SOEs because their prescribed mode of change with a focus on a single entity coincide with the requirements determined at the beginning of this chapter. However, not all articles included in group 1 present a strong focus on how organizational transformations affect internal processes of the management accounting system. The article by Chenhall and Euske (2007) discusses the role of management control systems in planned organizational change. The framework they apply to analyze the change process does not provide a process perspective, which is one of the core requirements when analyzing management accounting of state-owned enterprises (cf. Suddaby et al., 2011; Björck, 2004). With their article on strategic alignment, Jayashree and Hussain (2011) focus on the usage of integrated and strategic tools throughout the change process. They do not describe the process of organizational transformation and its effects on management accounting. Appelbaum et al. (1998) develop a framework for strategic organizational change. Similar to the contribution of Jayashree and Hussain (2011), they do not provide a detailed perspective on the change process inside the organization but do address external effects as ascendants to organizational change. Also, Appelbaum et al. (1998) do not provide detail as to how management accounting methods should be integrated into the legal requirements in a regulated market environment (De Lancer Julnes & Holzer 2001; Bozeman, 2013). Thus, these three articles of group 1 are excluded from further research. Subsequently, to derive our framework from literature we will focus on the remaining six articles allocated to life cycle theory to further elaborate on management accounting changes in SOEs.

3 TOWARDS A FRAMEWORK FOR ORGANIZATIONAL TRANSFORMATION IN IT DEPARTMENTS OF SOES

3.1 Deriving Building Blocks for an Organizational Transformation Framework

To develop an organizational transformation framework, we first summarize the main contributions from our focus literature (s. Table 16).

Literature Source	Contribution
Buns and Scapens (2000):	Internal, process-oriented concept of change, based on actions, rules and routines inside the management accounting department
Dambrin et al. (2007):	Macro view on the stages of the diffusion process based on neo-institutional sociology, analyzing ideas, discourses, and techniques as ascendants of internalization
Sharma et al. (2010)	Dynamic perspective on changes and introduction of major stakeholders in the change process
ter Bogt and van Helden (2000):	Combined framework to illustrate the development gap resulting from the accounting change process and the usage gap between newly developed accounting methods and their actual application
Cunningham and Kempling (2009):	Enumeration and explanation of essential change principles to assist change in public sector organizations
Dillard et al. (2004):	Three-level framework encompassing economic and political levels, organizational field level down to the organizational level to analyze levels of social, political, and economic issues

Table 16: Main contributions from our focus literature

To assess the applicability of the above contributions in an SOE environment, we then reviewed to what extent these contributions comply with the characteristics of organizational transformation in SOEs as described in section 2.1 of this paper. We differentiated the degree of compliance using three levels. Articles that comprehensively explain a requirement and explicitly implement it into the framework are classified as a “match”. If articles briefly consider a requirement but do not incorporate it into the framework they are classified as a “partial match”. Those articles that do not consider the requirement concerned are classified “no match”.

The first requirement to be considered with management accounting change in SOEs characterizes the need for dynamic process incorporation in management accounting of SOEs. The concept of Burns and Scapens (2000) analyzes accounting change as a dynamic process (ter Bogt & van Helden, 2000). This also applies to the framework of Sharma et al. (2010), which enables a dynamic representation of the institutionalization process. Regarding the dynamic process requirement, Dillard et al. (2004) visualize the institutionalization process in a recursive way. Thus, these three papers are classified as “match” with this requirement.

Stakeholder integration is the second requirement that must be taken into account in the change of management accounting in SOEs. Two articles comply with this requirement. Although they do not provide a detailed process-oriented framework, Cunningham and Kempling (2010) consider public stakeholders as relevant factors in their change principles. Sharma et al. (2010) integrate the stakeholder perspective explicitly into their framework. By recognizing higher levels of social, political and economic issues, Dillard et al. (Dillard et al., 2004) provide a platform for stakeholders, although they do not explicitly incorporate them into their framework. Thus, we classify their framework as a “partial match”.

The third requirement deals with the detailed representation of the change process. One framework complies with this requirement: Burns and Scapens (2000) explain the change process on a detailed organizational level (Dillard et al., 2004). The framework of Dambrin et

al. (2007) recognizes higher levels of social, political, and economic issues and provides a platform for stakeholders; however, these authors do not explicitly incorporate these issues into their framework. In general, the framework of Dambrin et al. (2007) was developed on a macro level and does not consider the dynamics in the process of accounting change or public characteristics. Thus, their framework is a “partial match” with the third requirement. The goal of the framework by ter Bogt and van Helden (2000) is to identify a development and usage gap in management accounting. Yet, their framework fails to capture the dynamic and detailed perspective of Burns and Scapens, which they use as a basis for their framework. Hence, the framework developed by ter Bogt and van Helden does not match this requirement.

The requirement to consider the attitudes of public employees is mentioned twice in the selected articles. Ter Bogt and van Helden (2000), whose framework is designed for management accounting change in government, consider the characteristics of public employees when analyzing the change process. However, they do not implement specific elements into their framework to depict these characteristics; their framework is thus classified as a “partial match”. Cunningham and Kempling (2010) explicitly focus on the characteristics of public sector organizations in their article, and consequently on public employees, when determining their change principles. Thus, they fully match this requirement.

Existing frameworks	Management Accounting Requirements of SOEs			
	1) Dynamic Process Incorporation	2) Stakeholder Integration	3) Detailed Representation	4) Consideration of Public Employees
ter Bogt and van Helden (2000)	-	-	-	(o)
Burns and Scapens (2000)	X	-	X	-
Dambrin et al. (2007)	-	-	(o)	-
Cunningham and Kempling (2009)	-	-	-	X
Dillard et al. (2004)	(o)	(o)	-	-
Sharma et al. (2010)	X	X	-	-
Key: X = Matches with the Requirement (o) = Partial Match with the Requirement - = No Match with the Requirement				

Table 17: Requirement-based evaluation of existing frameworks

Table 17 summarizes the findings of the requirement-based evaluation of existing frameworks and shows the lack of an appropriate conceptual framework for organizational transformations in SOEs. Thus, none of the existing frameworks meets all four requirements of management accounting change in SOEs. Three of six frameworks fully match two requirements of SOEs. This leads to the selection of the following three articles as basic elements of the conceptual framework for management accounting change in SOEs: Burns and Scapens (2000), Cunningham and Kempling (2009) and Sharma et al. (2010).

3.2 Organizational Transformation Framework for IT Departments in SOEs

To include the above contributions into our framework, we use the punctuated equilibrium model for organizational change (cf. Tushman & O’Reilly, 1996). Using this model, the

elements of each framework are assigned to the basic states of organizational change according to the punctuated equilibrium model. The punctuated equilibrium model proposes two states (cf. Gersick, 1991; Sabherwal et al., 2001). One state consists of a long phase of stability, called the equilibrium. It is characterized by persistent structures and only small and incremental changes inside the organization. The second state describes short periods of revolution, the 'punctuations', fundamentally alter underlying structures and cause qualitative changes.

The equilibrium in Burns and Scapens' (2000) framework is represented by the institutions with defined rules and routines as well as by specified actions, illustrated by the black outlined rectangles in Figure 2. The framework of Sharma et al. (2010) also contains institution as an element to incorporate the state of persistent structures. The state of fundamental change according to Burns and Scapens (2000) is comprised via process reproduction as well as institutionalization, which form the transition into the new institution. Sharma et al. (2010) use the element 'uncertainty' for this state. The change principles presented by Cunningham and Kempling (2009) also depict the transition phase of a public organization with qualitative changes and, therefore, are assigned to the revolutionary state. In the following, all elements of the three frameworks are integrated according to the states of the punctuated equilibrium model. The new framework will provide an internally consistent illustration of organizational transformations. Based on the characteristics of organizational transformation in IT departments of SOEs, the framework (see Figure 14) embodies the dynamic process model for accounting change according to Burns and Scapens (2000). The model encompasses four basic elements: the institutional realm, routines, rules, and the realm of action.

The institutional realm comprises assumptions and habits that govern organizational activities and relationships of the actors. Rules include specific procedures and formal descriptions of the management accounting system. Routines, however, represent the currently applied management accounting methods based on the management accounting system. The realm of action follows the specified organizational conditions set by the institutional realm, rules, and routines and refers to the execution of management accounting methods.

Based on this, the conceptual model with its interaction between the four elements is being expanded by the integration of external change stakeholders (see Table 17), which is an indispensable requirement for public organizations. These stakeholders are characterized by 1) not being members of the change unit, and 2) having a decisive role regarding the mode of change. They are integrated in the new framework according to the model of Sharma et al. (2010) who identified the interactions between involved external change stakeholders and institutions. There are three types of external change stakeholders that should be differentiated: change agent, external stakeholders, and change manager.

The change agent, as strategic stakeholder, is interested in organizational transformations and can leverage resources to create new institutions or to convert existing ones (Maguire et al. 2004). Possible triggers for organizational change may arise from contradictions of the existing institution or from external stakeholders, e.g., through changes in customer requirements or political interests, and are taken up by the change agent. According to the triggers, the change manager can destroy prior institutional occurrence and may give rise to some uncertainty due to the undefined transition status (Sharma et al., 2010).

After integrating the basic model of Burns and Scapens (2000) with the external change stakeholders according Sharma et al. (2010), we then assign the nine assisting change principles as evinced by Cunningham and Kempling (2009) in the model to consider attitude and commitment of public employees.

First, the change agent should establish the need for change (1). Together with external stakeholders and the change manager, the change agent forms the guiding coalition (2), which is a committed leadership team representing the informal organization, gathering information and conducting adjustments during the change process (Cunningham & Kempling, 2009). The guiding coalition develops a commitment plan (3) and defines communication compliance during the change process. The framework is supplemented by four further change principles to enhance the public perspective in the model. The definition of reorganization goals (4) and continuous improvement throughout the project (6) are also affiliated to the manager. The remaining principles focus on the adjustment of operative structures in the organization (7) and the encouragement of the employees to execute new actions (8). The role of the change manager is an operative one, responsible for recognizing as well as responding to resistances (5) in the change process and implementing new rules and routines (9) through the institutional domain into the transformed organization (Sharma et al., 2010).

Thus, all requirements of management accounting in SOEs are implemented by the framework (Figure 14). Between the two institutional states (initial institution and new institution after the change process), some uncertainty may arise from the deinstitutionalization during the transformation process amongst organizational actors (Sharma et al., 2010). The elements displayed using dotted-lines identify the revolutionary transition phase (cf. punctuated equilibrium model). Figure 14 presents the framework which contains all elements for an organizational transformation framework to be applied in the SOE domain. The arrows represent likely interactions among organizational elements and change stakeholders, not causation between those. The elements marked with a '*' represent the new equilibrium of the organization incorporated by its institutional realm, rules, routines and actions.

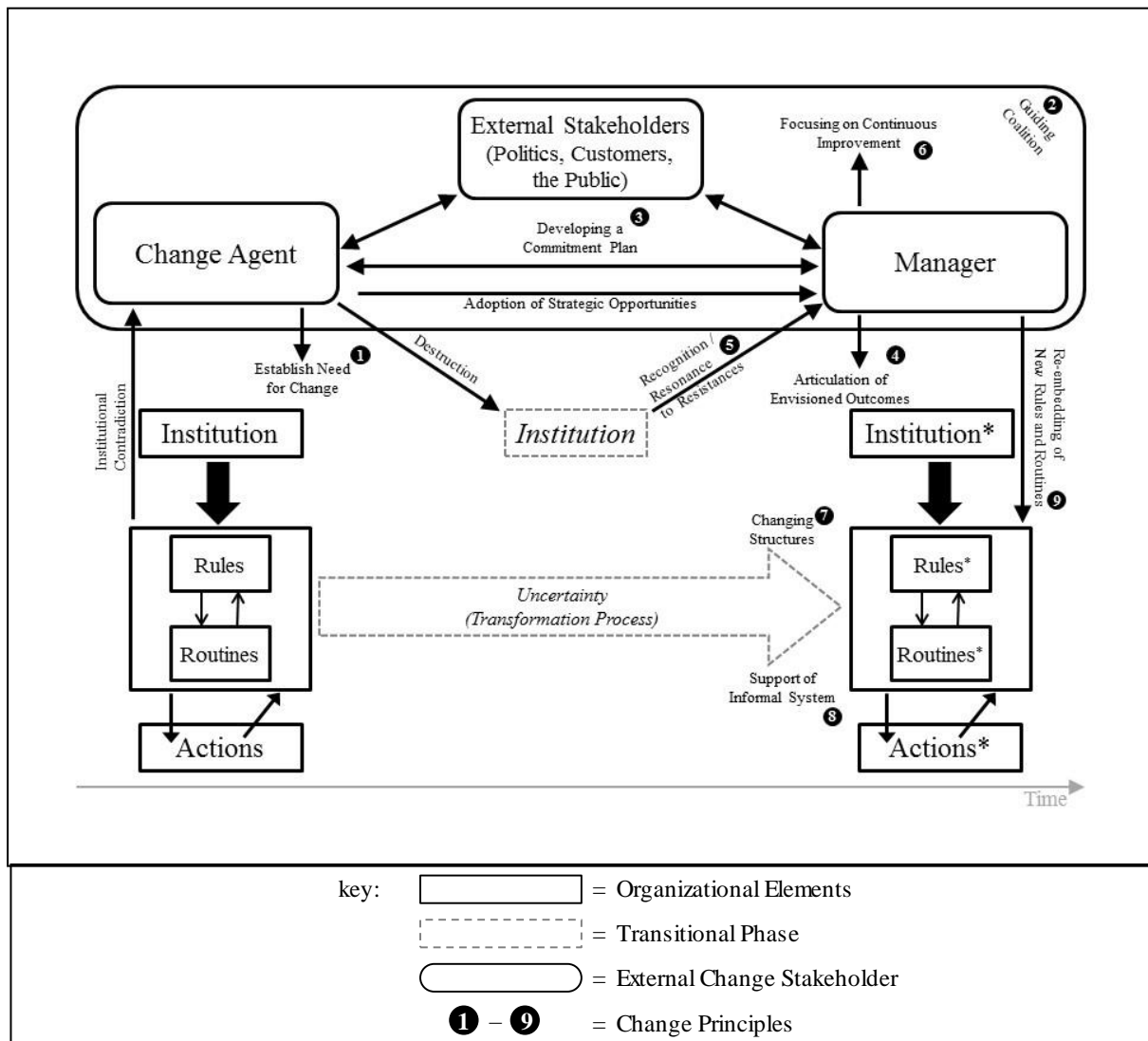


Figure 14: A framework for organizational transformation in IT departments of SOEs

4 A CASE STUDY ON MANAGEMENT ACCOUNTING CHANGE IN IT DEPARTMENTS

4.1 Research Design

Having derived our framework for organizational transformation in IT departments of SOEs, we next apply the framework in a single case study. We chose an exploratory qualitative research approach to conduct this study because an in-depth understanding of factors that cause or overcome transformation barriers in IT departments of state-owned enterprises is required to apply the developed framework. In line with this goal, semi-structured interviews allow the interviewees to answer freely instead of choosing predefined answers from a list (Myers & Newman, 2007). Semi-open questions also help to collect additional and possibly hidden information and, moreover, provide the flexibility to ask targeted inquiries during the interviews (Myers & Newman, 2007).

The following case study draws on the recommendations of Dubé and Paré (2003) and Paré (2004) for case study research. Case study research is clearly useful when a natural setting and contemporary events are in focus (Benbasat et al., 1987), which applies in this research. A single case study is appropriate in this context as it contributes to testing the capabilities of a framework (Yin, 2008).

We selected a German airport that is majority-owned by a German federal government. Some of the supervisory board members of this airport are politicians. The focus of this study draws on ERP system introduction and business process redesign activities in the IT department. What made the case especially intriguing for our research is that the airport outsourced its IT department several years ago to a joint venture subsidiary together with a company leading in the field of the introduction of a new ERP system and business processes. Thus, the case study partners had in-depth experience in the field of changes in IT management and re-design of business processes.

4.2 Data Collection and Analysis

A semi-structured interview was used as the primary tool for data collection. To answer the applicability of the framework, a questionnaire was developed covering two main areas. In the first part, the structure of the company, the management accounting tools and processes used as well as the procedure and the experiences of the outsourcing process, was queried. The second part focused on identifying success and failure factors as well as challenges and requirements for the management of the IT department.

In total, we conducted 10 interviews with five interview partners. The interview sessions took place in 2012, 2014 and 2017. The interview partners were: the vice president IT financial management (I1 / 2014 / 2 interviews), head of information management (I2 / 2012, 2017 / 2 interviews), senior vice president corporate IT (I3 / 2014 / 4 interviews), vice president corporate financial management (I4 / 2014 / 1 interview), and manager corporate IT accounting (I5 / 2017 / 1 interview). All interviews were done face-to-face. The professional experience of the interviewees ranged from 5 to 30 years. The interviewees held different jobs in their organization. The interviews lasted between 45 minutes and 2.0 hours and the interview language was German for all interviews.

The decisive factors for selecting the interviewees was comprehensive experience regarding the entire outsourcing process, possession of fundamental knowledge in the field of IT management accounting, and the ability to describe changes in the IT department from a general perspective. This focused approach essentially follows the characteristics of the homogeneous sampling of Patton (2002). In terms of content, the interviews covered the timeframe before project begin until now. Thus, the state of the ERP system and business processes before and after as well as the change process can be captured.

We analyzed the interviews using qualitative analysis techniques. All expert interviews were tape-recorded and transcribed afterwards. To evaluate the information from the interviews systematically, the interviews were coded in a spreadsheet data base according to the guidelines of qualitative content analysis by Mayring (2009). For this, a summary of the content of the statements based on the literal statements was prepared. Then three coding elements were

introduced. The first coding element determines whether the temporal relation of the statement lies before or after the outsourcing. The second coding element is used to extract the management accounting instrument within the statement. The third element serves to assign the statement to the model we have designed. In addition, a coding element was used to identify success or failure actors. The quotations cited in this paper were translated into English by the authors and cross-checked by an English language editor.

As the final step in our analysis of data, the information of the coding elements (time period, management accounting tool, etc.) is transmitted into the framework. Table 18 presents an excerpt of the coding table.

#	Question	Answer (literally)	Before / After Outsourcing	Management Accounting Tool	Reference to the Framework	Success / Failure Factor
2.4	What arguments / decisions have led to use the actual tools?	The focus is on the operating business, it has to work. A profit center accounting did not exist and it was not tracked either. I think profit center accounting fits good, but it was not performed. Both, the corporate management accounting and board of directors, have no IT affinity. IT is still seen as a black box and a big cost factor, but not as a business enabler.	Before and after	-	Institutional level	Failure factor: no management attention of affinity to IT; IT is not seen as possible business process enabler
2.5	Regarding transparency, which management accounting tools do you use?	Yes, we use internal charging. That has to do with cost-sensitive assignment of 100% of the potential hours to individual products. Furthermore, there is a ticket system but it does not distinguish between incident and change. It all comes together and that is difficult. An estimate is better than nothing. But the insight is missing.	Before and after	hour charging; Ticket system;	Routines; Actions	Success / failor factor: coach the employees on KPIs; Try to allocate as realistic as possible (no 100% cost allocation)

Table 18: Extract from the coding table with interview data

Additional information from both internal and external sources was searched and analyzed to triangulate the results. This encompasses organization charts, business reports and service descriptions. The information was used to better understand the statements of the interview partners regarding the four subject areas mentioned above.

4.3 Application of our Framework to the Case

At first, the unit of change and mode of change determined by Van de Ven and Poole (1995) must be assessed to determine if they apply to the process-oriented concept of the framework. In this case the unit of change is the management accounting unit of the IT department (part of the overall IT department), thus it is a single entity. Based on the data from the case study, the mode of change complies with the prescribed change mode as the change was initiated in order to incrementally transfer the internal IT department into a new IT subsidiary. Thus, according to Van de Ven and Poole (1995) it is a life-cycle or stage-based change and is compliant to the process-oriented concept of the framework.

The new ERP system introduction project started in 2002 with an outsourcing project. The initial goal of the outsourcing project was to additionally offer IT solutions to the regional market to reduce operational cost by economies of scale and to generate contribution margins with additional external revenues. Interviewee I1 explains the cost structure of the company:

Our experience shows that 40 percent of our costs are directly sales-related costs. 60 percent are overhead; overhead costs are usually higher.

In order to reduce overhead costs, the company's own IT department has become a new joint venture subsidiary, which was founded together with a private operating company. This joint venture company is partial owned by the airport and, consequently, also a SOE. The IT subsidiary is responsible for running the IT infrastructure and applications for the airport operator. To concentrate the corporate IT control, a new organizational unit inside the parent company (called information management [IM]), was founded. The purpose of IM is to make decisions on a strategic level with regards to IT management accounting. IM serves as a communication link between the airport operator and any external IT service provider. From the parent company side, IM should be the main contractor for IT products and services. Hence, the business units of the airport made decisions directly with the IT service provider in many cases. An IT contract was signed at the beginning of the outsourcing process. This contract does not contain a service level agreement (SLA) and it has been infrequently updated since the beginning of the IT outsourcing, as the interviewee I2 describes:

Yes, 10 years ago, a contract was made with them [the founded joint venture IT subsidiary]. The contract defines services and prices but no real service levels, just reaction times, what is legitimate for subsidiaries. The contract was reviewed from time to time, but it was not revised carefully.

According to I2, there is a lack of a working contract management. Contributing to this problem are the following factors: a missing service monitoring in the IT management accounting departments of both companies, a lack of quality measures and SLAs in the outsourcing contract, and missing updates of the contract documentation. I2s explanation for the inadequate contract management refers to the fact that the IT provider is a subsidiary of the airport. Further reasons for the inadequate contract management include the layoff in the management level of the IT service provider after the outsourcing process and the failed attempt to sell IT products in the regional market.

The employees of the IT service provider have a conservative attitude and tend to refuse organizational changes in business structures. Furthermore, the IT organization lacks sufficient qualified employees, as I3 reports. There are special IT applications for which employees lack the appropriate experience and know how. I2 suggested hiring a consultant to temporary help solve a specific problem efficiently. However, this was not possible as the management did not agree on an additional budget to support this suggestion. I2 provides the following example:

The budget is too small, otherwise I would hire management accounting consultants. However, there is a lack of understanding in the company. I'm confident if I go into the executive board and apply for 100,000 Euros for implementing a new IT governance concept, they would not authorize it.

Moreover, not just the employees but also management is conservative and has no apparent desire or willingness to change to accommodate innovations. The management level of the IT service provider is concerned with lowering total costs as not to exceed the budget allocated to them by the parent company. Due to this strong focus on total cost reduction and the missing

competition with other market participants, there is little or no impulse to change or be innovative.

There is also a lack of a clear IT strategy and governance. I2 explains that the business units can request new software as they like – without considering the corporate IT strategy. The airport operator has no binding IT governance; for example, how to proceed in the case of purchasing new software and replacing outdated software. Another example for the missing IT governance is the role conflict between IM and the executive board. On the one hand, IM is responsible for harmonizing the IT portfolio by, for example, getting rid of redundant or inefficient applications. On the other hand, the board of executives is responsible for the budget. However, the board does not provide additional budget for IT standardization projects. Looking at IT management accounting tools, the airport strategic tool can provide a clear definition of goals. There are some tools available for measuring the technical performance (availability or stability of IT systems), but there is no roadmap that shows the strategic IT components and landscape for the next couple of years.

I2 explains that the company did not think about defined and working IT processes before initiation of the IT outsourcing. This should concern all organizational processes affected by IT products or services. After defining these processes, the company needs to decide which processes are going to be outsourced. It is important to outsource entire processes with limited organizational interfaces. Because the organization of the airport is still functionally organized and not based on processes, it was very difficult to outsource processes that run through the whole organization, for example the IT purchasing process. Because the IT subsidiary is completely owned by the operator and the corporate business units had to purchase their IT services from the corporate IT provider, there was no need for the IT managers to try to better understand the challenges arising in the business units. According to I4, in comparison to the IT subsidiary, an external service provider can contribute several benefits:

The main tasks of an external service provider are of course the provision of a functioning IT environment and a high degree of standardization. The external service provider should contribute know-how and experience to innovate and to monitor the IT market regularly.

Looking back at the outsourcing process, I5 critically notes that in 2017 the tools and procedures in IT management accounting are still on a low level, although one goal of the outsourcing process was to improve transparency regarding e.g. the costs of service delivery. As the airport is a SOE providing infrastructural services of general interest and does not directly experience competition due to its local monopoly, the pressure from its public shareholders to improve efficiency and innovative power is minimal. However, structural changes in the aviation industry and the withdrawal of the public shareholders to provide further financial resources led to a change in corporate governance. Thus, the airport business divisions were set up as profit centers and pursue economic objectives. This led to a critical perspective on all internal services, including IT services. From the specification of minimal area cost, an extensive internal service accounting via cost center reports and charging per project hours was developed. Based on the idea of the shareholders to lower IT costs by generating external revenues in the regional market, the executive board decided to outsource the IT department into a joint venture subsidiary.

Without considering the IM unit, the executive board tried to set up a new market strategy and commitment plan with the newly hired IT subsidiary management. This organizational and personnel situation was obstructive for building up a guiding coalition. Furthermore, the executive board persisted with their objective to lower total IT costs. Because of those strict budget regulations, the new IT management could not meet with the commitment plan as well as the initial goal of winning new customers in the regional market.

To avoid additional discussions with the works council and follow a course of least resistance, the executive board transferred the existing organizational structure of the IT department without modification into the IT subsidiary and offered job guarantees to all IT employees. Without making necessary changes in the organizational or informal structure the new IT management could not implement new rules and routines which has been inherited of the former parent company and was therefore forced to maintain the existing ones. As the initial goal was dropped, the institutional routines did not change from those found in the former IT department. The idea of low IT costs resulted in a continuous reduction of IT-budget for the IT subsidiary. Figure 15 summarizes the results of the application of the framework for organizational change in IT departments of SOEs.

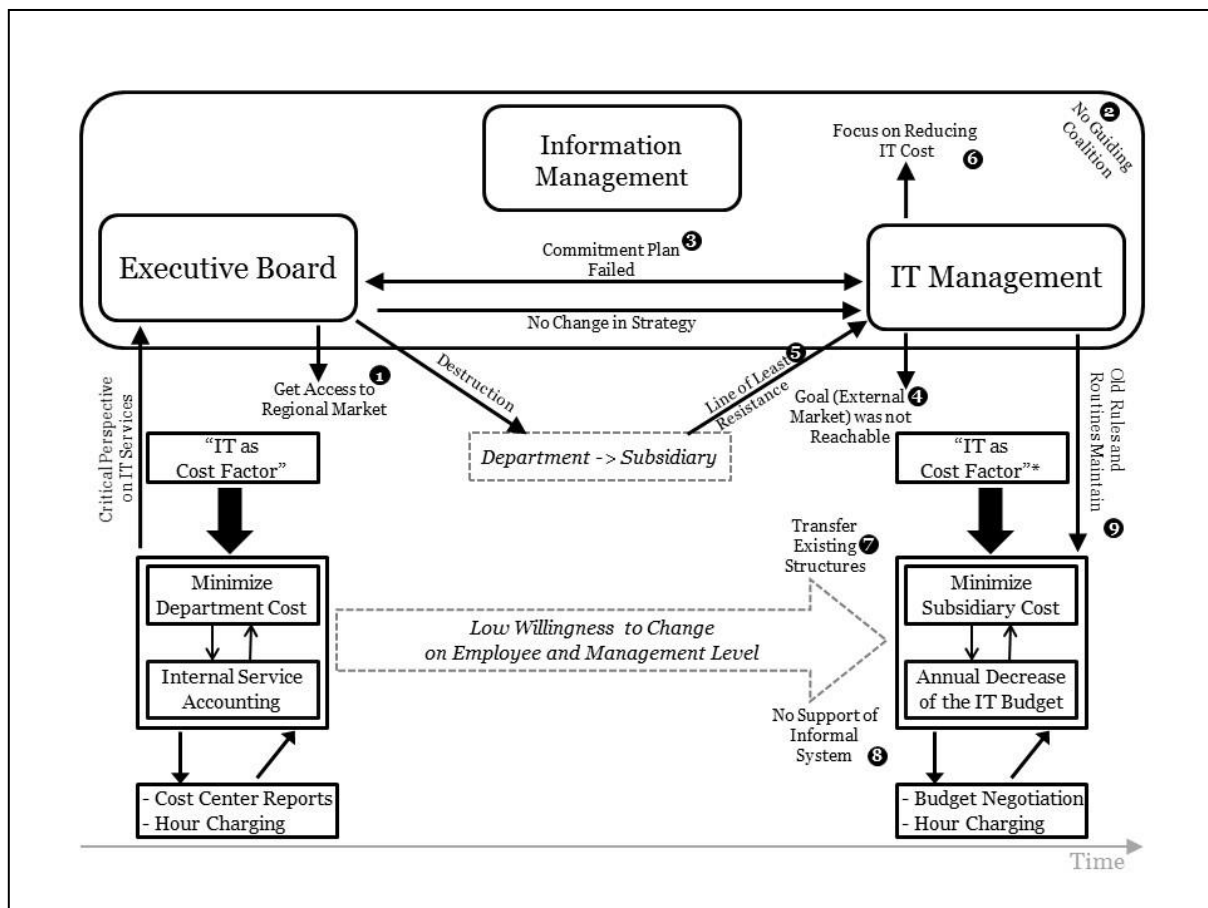


Figure 15: Transformation process of management accounting in the IT department

5 FINDINGS AND DISCUSSION

Our findings from the literature review show the lack of an appropriate conceptual framework for organizational transformations in SOEs. None of the existing frameworks meets all four requirements of management accounting change in SOEs. With our research we can close this research gap by providing a framework to systematically identify transformation barriers in SOEs.

The previous section provides an example for management accounting change in SOEs. As the case shows, the rules and routines with the introduction of the new ERP system did not change after the outsourcing process, although the parent company tried to set up a new, competitive IT subsidiary. The framework enables systematic insights into the change process and helps to identify some transformation barriers that we will discuss below.

As the framework shows, the initial need for change seems appropriate. That is, the idea of the executive board to set up an IT subsidiary with external customers to improve the cost situation and product innovation for the existing business units of the airport. But there was no consistent connection of the initial need for change from the organizational unit to all stakeholders at the management level. One example of this is represented in the framework by the lack of arrows to the change stakeholder “information management”, which was not involved in the change process by the other change stakeholders. Therefore, in the framework the change trigger can be observed along the transformation, starting with the institutional situation (critical perspective on IT services) to the stakeholder level (executive board) and the associated change principle, incorporating the need for change (get access to regional market). The three basic concepts of Burns & Scapens (2000), Sharma et al. (2010), and Cunningham & Kempling (2009) solely would not provide this insight systematically on their own.

Further insight can be drawn from the connections inside the guiding coalition. In addition to the three change stakeholders (change agent, external stakeholders and manager) the guiding coalition consists of two linking change attributes: development of the commitment plan and adoption of strategic change opportunities. In contrast to the existing frameworks by Sharma et al. (2010) and Cunningham and Kempling (2009), the framework we propose integrates the aspects of the linking change attributes. Hence, the framework is able to analyze reasons for stable or loose guiding coalitions, as the practical example reveals.

The initial idea of a strategic change in IT and the associated commitment plan suffered when the IT management had to reduce overall IT costs. The guiding coalition, including the executive board, did not adequately respond to this situation. Moreover, at the end of the change process, combining the three basic models via the framework enables the analysis of the unsuccessful implementation of new IT management accounting tools. One reason for this unsuccessful implementation is the unmodified transformation of the existing IT department structure into the IT subsidiary (change principle). Another reason can be found in the loss of the initial change trigger and the strong focus of reducing cost in the IT subsidiary (change participants). Thus, because of the unchanged structures and the unchanged institutional background, the IT management could not implement new IT management accounting tools such as qualitative measures or SLA monitoring (organizational elements).

In addition to the previously mentioned change principles according Cunningham and Kempling (2009) in the framework, the lack of support of the informal system in terms of too little time taken to coach the employees and not keeping track of staff competencies lead to invisible resistance in the change process on the organizational level. As the discussion shows, the framework enables a systematic and in-depth analysis of the change process by combining three basic accounting change concepts.

Our framework helps to identify two empirical transformation barriers. One transformation barrier affects employees. As the framework shows, the employees' needs were not considered in the change process. The executive management followed the path of least resistance and did not change the organizational structure. Furthermore, there was no influence of the leadership team on the informal system via coaching or individual conversations. The employees were not introduced to the new IT strategy, which offered them potential benefits. Hence, it would have been supportive to entrust the employees with more challenging and responsible tasks such as contract management instead of cost center accounting.

The second transformation barrier is derived from the framework and concerns the external change stakeholders. The framework reveals the missing integration of IM into the change process. IM was not able to implement an adapted IT governance concept. The decoupling of competencies between all three change participants in this case would have been helpful to reliably bind them with the commitment plan and to form a stable guiding coalition.

These two insights were very helpful for the further development of the founded IT subsidiary. In 2016, parts of the IT subsidiary were sold to another service provider. During this organizational transformation, the findings from the first outsourcing phase were given special attention, as confirmed by two interviewees in the 2017 interviews. Thus, the outsourcing could be supported with good conditions for economic success and stable business development in the coming years.

As our literature review shows, different basic theories to describe the process of change in organizations have been applied so far. However, only frameworks using life cycle theory as a basic theory are compatible with SOEs as they focus on a single entity and enable a detailed analysis of the effects on the management accounting system arising from planned organizational transformations. By assessing the remaining articles with the management accounting requirements of public organizations, we determined that none of the articles comprise all four requirements of management accounting change in SOEs.

Finally, our framework enables a systematic analysis of the organizational transformation along the change process. The comparison of the practical case shown in the framework with the initial framework (Figure 14) reveals two empirical transformation barriers which were not identified by the company's experts during the interviews. Thus, the new framework for management accounting change in IT departments of SOEs can determine additional insights from organizational transformations.

Applying the framework to further case studies will help researchers and practitioners to better understand if factors exist in SOEs but not in private companies that influence organizational change projects. As we performed a single case study in this paper, additional case studies might

be useful to further explore and verify our results. Researchers might target countries other than Germany for further validation of our framework

6 CONCLUSION

This contribution extends research on organizational transformations and SOEs. We developed a new framework by building on three existing models via the punctuated equilibrium model, which enables a systematic insight into the organizational transformation of management accounting in SOEs. Underlying major aspects of the new framework include its dynamic process incorporation, explicit stakeholder integration, a detailed representation of the change process, and the consideration of the characteristics of public employees. Thus, our framework represents a holistic consideration of all four requirements on introducing new ERP systems and business processes in IT departments of SOEs. We applied our new framework to a case study and showed that the framework can identify transformation barriers which were initially hidden to the managers involved in the change process (e.g., required change of organizational structures, required change of SLAs).

For researchers, we provide a framework to analyze the effects of organizational transformations when introducing new ERP systems and business processes in IT departments of SOEs. For practitioners, this framework can become a valuable tool to actively shape the organizational transformation in their IT department. Insights of our framework can help practitioners to enable successful organizational transformations, as our case study shows in retrospect.

PUBLICATION 5**Lessons Learned aus der Umsetzung der Prozesskostenrechnung bei einem Cloud Computing-Anbieter⁵**

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Während der Markt für Cloud Computing an Bedeutung gewinnt, stellt er Anbieter vor neue Herausforderungen in der Kostenrechnung. In einem Projekt bei einem Cloud Computing-Anbieter wird untersucht, wie diese Herausforderungen mit Hilfe der Prozesskostenrechnung gelöst werden können. Es wird gezeigt, dass die Prozesskostenrechnung erlaubt Kosten differenziert zu erfassen und vielen kostenrechnerischen Herausforderungen des Cloud Computing zu begegnen.

1 MANGEL AN SYSTEMATISCHEN ANALYSEN KOSTENRECHNERISCHER ASPEKTE VON CLOUD COMPUTING

Cloud Computing zählt zu einem der wichtigsten Technologietrends für die kommenden Jahre (vgl. Bughin/Chui/Manyika, 2010, S. 10 f.). Eines der Hauptmotive für den Einsatz von Cloud Computing-Lösungen ist das Kostensenkungspotential von bis zu 5% der unternehmerischen Fixkosten (vgl. Deutsche Bank Research, 2012, S. 5). Dennoch sollte beachtet werden, dass mit dieser neuen Technologie vielfältige Herausforderungen auf technischer, rechtlicher, organisatorischer und wirtschaftlicher Ebene verbunden sind (vgl. Deutsche Bank Research, 2012, S. 6). In Forschung und Praxis liegt der Fokus derzeit primär auf den rein technischen Aspekten (Leimeister et al., 2010, S. 2). Wirtschaftliche Gesichtspunkte und Aspekte des Kostenmanagements werden kaum betrachtet (vgl. Hoberg/Wollersheim/Krcmar, 2012, S. 299).

Die vorliegende Arbeit konzentriert sich auf Herausforderungen bezogen auf das Controlling, im engeren Sinn auf das Kostenmanagement (vgl. Soth, 2011, S. 1 ff.), im Cloud Computing-Umfeld. Es wird untersucht, inwiefern diese durch den Einsatz der Prozesskostenrechnung bewältigt werden können. Zunächst werden in Kapitel 2 die begrifflichen Grundlagen und die kostenrechnerischen Herausforderungen erläutert. Kapitel 3 beschreibt die Vorgehensweise bei der Umsetzung der Prozesskostenrechnung bei einem Cloud Computing-Anbieter. Abschließend werden in den letzten beiden Kapiteln die Ergebnisse sowie deren Bedeutung für die Lösung der beschriebenen Herausforderungen diskutiert.

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2 BEGRIFFLICHE GRUNDLAGEN, ITIL-PROZESSE UND KOSTENRECHNERISCHE HERAUSFORDERUNGEN

Cloud Computing

Der Begriff Cloud Computing bezieht sich sowohl auf das Bereitstellen von Anwendungen über das Internet als auch auf Hardware und Software in Rechenzentren, die das Bereitstellen dieser Anwendungen ermöglichen. Dabei werden Hard- und Software im Rechenzentrum als Cloud und die Anwendung, die dem Endnutzer zur Verfügung gestellt wird, als Utility Computing bezeichnet (vgl. Armbrust et al., 2009, S. 4). Mit Hilfe dieser Beschreibung können die wesentlichen Merkmale von Cloud Computing-Lösungen abgeleitet werden (vgl. Mell/Grance, 2011, S. 6):

1. Kapazitäten (z. B. Rechenleistung oder Speicherplatz) werden vom Kunden selbstständig und bedarfsorientiert angepasst.
2. Der Zugriff auf Cloud-Dienste erfolgt über das Internet, wobei standardisierte Protokolle zum Einsatz kommen.
3. Es existiert ein geteilter Ressourcenpool, aus dem Kunden bedarfsgerecht bedient werden.
4. Die Nutzung der Kapazitäten wird gemessen und die Abrechnung erfolgt nach dem pay-per-use-Prinzip.

Wie sich aus den Merkmalen ableiten lässt, übernehmen Cloud Computing-Anbieter vielfach Aufgaben des Anwendungsbetriebs. Für den Anwendungsbetrieb spielt das Servicemanagement eine zentrale Rolle.

ITIL-Prozesse

Bei der Prozesskostenrechnung werden Gemeinkosten von Vorgängen (Aktivitäten) über quantitative Bezugsgrößen (Kostentreiber) verrechnet. Der erste Schritt der Prozesskostenrechnung ist daher immer eine Aktivitätenanalyse. Da für Cloud Computing das Service Management eine wesentliche Rolle spielt, wird an dieser Stelle auf die Information Technology Infrastructure Library (ITIL) zurückgegriffen. ITIL stellt einen de facto Standard für das Servicemanagement dar (vgl. Böttcher, 2008, S. 1) und liefert Empfehlungen für die Gestaltung (Service Design), die Umsetzung (Service Transition), den Betrieb (Service Operation) sowie die Verbesserung (Continual Service Improvement) von Unterstützungsprozessen (vgl. Böttcher, 2008, S. 3 f.). In dem im Folgenden beschriebenen Projekt kann bereits darauf aufgebaut werden, dass die Organisation des Cloud Computing-Anbieters teilweise konform zu ITIL-Empfehlungen ist.

Für den Servicebetrieb werden von Böttcher (2008, S. 121 ff.) fünf Prozesse beschrieben: Event Management, Incident Management, Request Fulfilment, Problem Management und Access Management. Im Rahmen dieses Beitrags werden das Request Fulfilment (Auftragsmanagement) und das Incident Management (hier 1st-Level-Support) näher betrachtet (vgl. Böttcher, 2008, S. 121 ff.). Diese Prozesse laufen in der Regel vollständig standardisiert ab und waren relativ überschneidungsfrei und abgrenzbar bei dem Cloud Computing-Anbieter in dem betrachteten Projekt implementiert. Zudem lagen Kostenrechnungszahlen für diese Aktivitäten vor. Alternativ wurde auch diskutiert das Event Management und das Access Management zu betrachten. Allerdings war die Implementierung noch nicht vollständig dokumentiert und Kostenrechnungszahlen waren nur sehr begrenzt verfügbar.

Andere Unterstützungsprozesse als die eben genannten sind komplexer und heterogener in ihrem Ablauf, sodass diese erst bei wiederholter, standardisierter Inanspruchnahme sinnvoll als

Prozess abgebildet werden können. Beispielsweise sind Aktivitäten, die im 2nd- oder 3rd-Level-Support (Problem Management) durchgeführt werden, inhaltlich sehr unterschiedlich ausgestaltet sowie zunehmend problemspezifisch und einmalig (z. B. behebbare Softwarefehler).

Herausforderungen für das Controlling von Cloud Computing-Anbietern

Aus den vorgestellten Merkmalen von Cloud Computing-Lösungen sowie den bereits ange deuteten Schwierigkeiten bei der Aktivitätenanalyse und der Umsetzung der Prozesskostenrechnung ergeben sich vielfältige Herausforderungen. In zahlreichen Forschungsbeiträgen werden diese und weitere kostenrechnerische Herausforderungen identifiziert, jedoch fehlen konkrete Lösungsvorschläge. Abb. 1 gibt einen Überblick über sechs in der Forschung beschriebene Herausforderungen. Inwiefern diese Herausforderungen im vorliegenden Projekt adressiert und gelöst werden konnten, wird in Kapitel 5 ausführlich diskutiert.

Nr.	Herausforderung	Beschreibung	Quelle(n)
1	Intransparenz des Dienstleistungsangebotes	<ul style="list-style-type: none"> • Immaterieller Charakter von Dienstleistungen • Mangelnde Informationen über Mengen der erbrachten Dienstleistungen • Ressourcenbedarf nicht abschätzbar 	<i>Gerling et al., 2004, S. 4, 6; Schäffer/Weber, 2002, S. 6, 8.</i>
2	Intransparenz der Betriebskosten	<ul style="list-style-type: none"> • Schwankende Nachfrage nach Leistungsangebot • Spitzenlasten • Mangelnde Kenntnis über Kostentreiber • Geringe Möglichkeit zur Beeinflussung der Kosten 	<i>Gerling et al., 2004, S. 4, 6.</i>
3	Hohe Individualität der Angebote	<ul style="list-style-type: none"> • Individuelle Produkte für jeden Kunden • Ausbringungsmengen schwer abschätzbar • Mechanismen für Prozessanalyse notwendig 	<i>Gerling et al., 2004, S. 5, 6.</i>
4	Hohe Abhängigkeit vom Kunden	<ul style="list-style-type: none"> • Flexibilität des Leistungsbezuges • Beeinflussung der Kosten durch Qualitätsansprüche des Kunden und Umfang der Leistungen (externer Faktor) • Modularität des Angebotes 	<i>Hoberg et al., 2012, S. 299; Gerling et al., 2004, S. 5, 6; Soth, 2011, S. 30; Schäffer/Weber, 2002, S. 6, 8.</i>
5	Problematische Preisgestaltung	<ul style="list-style-type: none"> • Mangelnde Kenntnis der tatsächlichen Kosten • Pay-per-use-Angebote von Kunden nachgefragt 	<i>Hoberg et al., 2012, S. 299; Gerling et al., 2004, S. 4, 6; Mell/Grance, 2011, S. 2.</i>
6	Keine geeigneten Personalführungs- und Anreizsysteme	<ul style="list-style-type: none"> • Leistungserstellung sehr unterschiedlich • Zunehmende Bedeutung der Mitarbeiter • Gesteigerte Anforderungen an Qualifikation der Mitarbeiter 	<i>Schäffer/Weber, 2002, S. 8; Weber/Strauß/Spittler, 2012, S. 108.</i>

Table 19: Herausforderungen an das Controlling von Cloud Computing-Anbietern

Die in Table 19 aufgezeigten Herausforderungen sind oftmals auf den immateriellen Charakter von Dienstleistungen zurückzuführen (vgl. Gerling et al., 2004, S. 4; Schäffer/Weber, 2002, S. 6) und gelten für Cloud Computing-Anbieter ebenso wie für reine Dienstleistungsunternehmen. Daher ist die Prozesskostenrechnung als Kostenrechnungssystem für diese Unternehmen besonders relevant und wird im folgenden Abschnitt erläutert.

3 ZIELSETZUNG UND VORGEHENSWEISE BEI DER UMSETZUNG DER PROZESSKOSTENRECHNUNG

Vorgehen und Vorstellung des Cloud Computing-Anbieters

Der Beitrag verfolgt das Ziel, ein Kalkulationsschema für das Incident Management (Auftragsmanagement) und das Request Fulfillment (Service Desk) des Hauptprozesses Servicebetrieb des Cloud Computing-Anbieters Alpha zu entwickeln. Alpha ist die IT-Betriebsgesellschaft eines großen deutschen Flughafens und hat sowohl interne als auch externe Kunden. Alpha sieht sich selbst in der Rolle eines Full-Service-Providers. In den Angeboten des Partnerunternehmens sind neben Hardware, Software und Wartungskomponenten auch Dienstleistungen wie z. B. 1st-, 2nd- und 3rd-Level-Support enthalten. Zudem beinhaltet das Leistungsspektrum des Praxispartners Server, Datenbanken, Speicher und Netzwerkinfrastrukturen. Aufgrund dieses Leistungsangebotes ist Alpha als Cloud Computing-Anbieter einzuordnen.

Bei der Entwicklung des Kalkulationsschemas wurde die Vorgehensweise der Prozesskostenrechnung mit der wissenschaftlichen Vorgehensweise der Aktionsforschung kombiniert. Aktionsforschung wird angewandt, wenn die Untersuchung und Änderung einer Organisation im Mittelpunkt steht (vgl. Susman/Evered, 1978, S. 582). Dies ist im vorliegenden Projekt der Fall. Die beiden Vorgehensweisen laufen einzeln betrachtet wie folgt ab: Die Prozesskostenrechnung (auf Basis von Ist-Werten) wird in den Schritten (1) Aktivitätenanalyse, (2) Ermittlung von Kosteneinflussgrößen, (3) Ermittlung von Prozessbezugsgrößen und (4) Ermittlung von Prozesskostensätzen durchgeführt (in Anlehnung an Horváth/Mayer, 1989, S. 216 ff.). Der von Horváth/Mayer (1989, S. 216 ff.) zusätzlich angedachte fünfte Schritt, die Ermittlung der Planprozessmengen, entfällt beim untersuchten Praxisfall aufgrund der retrospektiven Betrachtungsweise. Die Aktionsforschung wird nach Susman/Evered (1978, S. 588) in fünf Schritten durchgeführt. Diese sind (1) Diagnose, (2) Planung, (3) Durchführung, (4) Evaluation, (5) Ableiten von Lessons Learned.

In Kombination werden jene beiden Vorgehensweisen in dieser Arbeit wie folgt angewandt: Die Diagnose und Planung wurden im zweiten Kapitel und in diesem Unterkapitel beschrieben. Die Durchführung wird dann in fünf Schritte zerlegt: (1) Zuerst findet eine IST-Analyse zur Erhebung der aktuellen Prozessstruktur und Kostenrechnung beim Cloud Computing-Anbieter statt. Schritte (2) bis (5) orientieren sich an den zuvor dargestellten Schritten der Prozesskostenrechnung. Die Evaluation findet sich schließlich im Kapitel 4 wieder und Lessons Learned werden im Kapitel 5 abgeleitet.

Neben den vier Autoren waren zwei Mitarbeitern aus der kaufmännischen Abteilung (Interviewpartner 1 (I1) und Interviewpartner 2 (I2)) der IT-Betriebsgesellschaft des Flughafens beteiligt. Das Projekt wurde zwischen Oktober 2012 und Februar 2013 durchgeführt. Alle Sitzungen wurden aufgenommen und die Aufnahmen im Anschluss transkribiert.

IST-Analyse

Bevor mit den Schritten der eigentlichen Umsetzung der Prozesskostenrechnung begonnen wurde, galt es zunächst die bestehende Situation beim Cloud Computing-Provider zu analysieren. Wie bereits beschrieben (vgl. Kap. 2), wurde der Servicebetrieb als Untersuchungsobjekt gewählt. Hier wurde die schematische Darstellung eines SAP-Professional-Accounts für das weitere Vorgehen zugrunde gelegt. Dabei standen pragmatische Gründe im Vordergrund, weil sich somit Kostenrechnungsdaten für die spätere Prozesskalkulation gewinnen ließen.

Figure 16 zeigt das bestehende Kalkulationsschema beim Cloud Computing-Anbieter. Die Kosten werden entweder über prozentuale Umlagen (z. B. Service Desk, Servicefeld- und Bereichsleitung) oder über Stundenschreibung (z. B. Engineering) auf den Kostenträger gebucht.

Aktivitätenanalyse

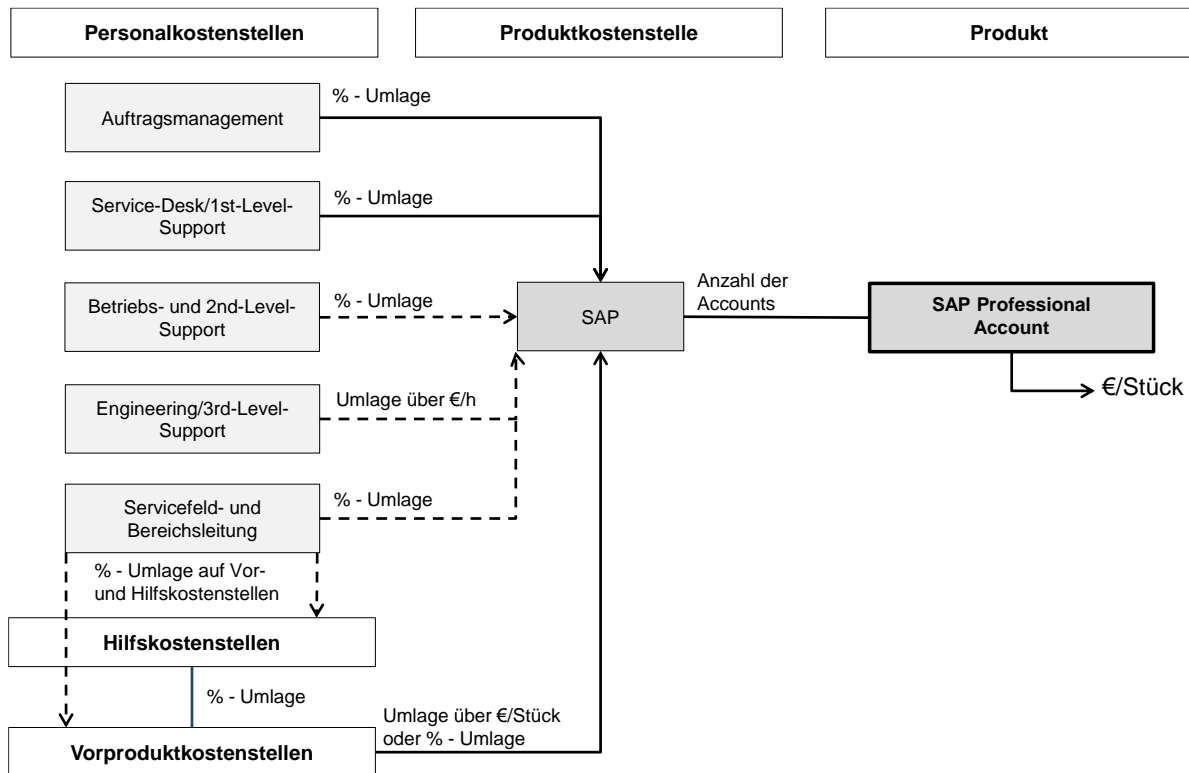


Figure 16: Bestehendes Kalkulationsschema beim Cloud Computing-Anbieter

Im Rahmen der Aktivitätenanalyse wurden sowohl bestehende Prozesse des Servicebetriebs beim Cloud Computing-Anbieter selbst dokumentiert als auch ITIL-Literatur zum Servicebetrieb identifiziert und untersucht. Da sich in der ITIL-Literatur vorgeschlagene Tätigkeiten auch in der Unternehmensorganisation wiederfinden ließen und relativ konsistent zu den ITIL-Vorschlägen implementiert waren, wurden – als Grundlage für die weitere Prozesskostenrechnung – die ITIL-Prozessbeschreibungen in Anlehnung an Böttcher (vgl. Böttcher, 2008, S.133 ff.) verwendet. Table 20 zeigt das Ergebnis der Tätigkeitsanalyse. Die betrachteten Prozesse Auftragsmanagement und Request Fulfillment wurden zudem in leistungsmengeninduzierte und leistungsmengenneutrale Tätigkeiten untergliedert.

	Auftragsmanagement	Request Fulfillment
Aktivitäten (lmi)	<ul style="list-style-type: none"> • Registrierung der Aufträge • Qualifizierung, Verifikation und Bewilligung • Abschluss des Auftrags • Verrechnung des Auftrags 	<ul style="list-style-type: none"> • Annahme und Dokumentation • Kategorisierung und Priorisierung • Behebung von einfachen Incidents • Eskalation an 2nd-Level-Support • Monitoring von Incidents • Kommunikation mit User
Aktivitäten (lmn)	<ul style="list-style-type: none"> • Servicefeld- und Bereichsleitung 	<ul style="list-style-type: none"> • Servicefeld- und Bereichsleitung

Table 20: Tätigkeiten in den Prozessen Auftragsmanagement und Request Fulfillment

Ermittlung von Kosteneinflussgrößen

Die Ermittlung der Kosteneinflussgrößen wurde in einer Diskussion der Projektbeteiligten durchgeführt. Für den Prozess Auftragsmanagement wurden in einem ersten Schritt als Kosteneinflussgrößen die Anzahl der Aufträge für die Aktivität Registrierung der Aufträge, die Anzahl erfasster Aufträge für die Aktivität Qualifikation, Verifikation und Bewilligung, die Anzahl bearbeiteter Aufträge für die Aktivität Abschluss des Auftrags und die Anzahl abgeschlossener Aufträge für die Aktivität Verrechnung des Auftrags identifiziert. Für den Prozess Request Fulfillment wurden die Kosteneinflussgrößen Anzahl der Incidents identifiziert. Für die Eskalation an den 2nd-Level-Support wurde zudem die Kosteneinflussgröße Anzahl kritischer Incidents erkannt.

Ermittlung von Prozessbezugsgrößen

Die Prozessbezugsgrößen wurden in einer weiteren Diskussion auf die Anzahl erfasster Aufträge und die Anzahl der Incidents festgelegt.

Berechnung von Prozesskostensätzen

Für die Berechnung der Prozesskostensätze standen folgende Informationen für das Geschäftsjahr 2012 zur Verfügung:

- Kosten des Auftragsmanagements und des Request Fulfillment
Die Personalbelastung für das Request Fulfillment betrug 1.074.274,49 € im Jahr 2012.
- Kosten der Bereichs- und Abteilungsleitung
Die Kostengesamtbelastung durch Abteilungs- und Bereichsleiter betrug für den Hauptprozess Servicebetrieb im Jahr 2012 1.174.466,11 €. Insgesamt sind in dem betrachteten Bereich 64,73 Vollzeitmitarbeiter tätig gewesen, wobei im Schnitt 12,8 Mitarbeiter für das Request Fulfillment tätig waren. Anteilig werden daher 232.244,19 € für das Request Fulfillment veranschlagt.
- Mitarbeiterzahlen des Auftrags- und Incident Managements
Die Mitarbeiterzahlen wurden als Maßgröße für die Verteilung der lmi-Kosten auf die Aktivitäten verwendet. Beispielfür das Auftragsmanagement lagen die in Table 21 präsentierten Zahlen vor.

Aktivität	Anzahl Mitarbeiter
Annahme und Dokumentation	4
Kategorisierung und Priorisierung	2
Behebung von einfachen Incidents	3,8
Eskalation an 2nd-Level-Support	1
Monitoring von Incidents	1
Kommunikation mit User	1

Table 21: Mitarbeiterzahlen für das Auftragsmanagement

- Anzahl der Aufträge und Incidents und weitere Mengeninformatoren
Für das Request Fulfillment lagen die in Table 22 dargestellten Mengeninformatoren vor:

Beschreibung	Anzahl
Gesamtanzahl Störungen	29.478
Erstlösungsquote	8.843
Weiterleitung an 2nd-Level-Support	14.739
Störungen ohne Erstlösung	20.635

Table 22: Mengeninformatoren Request Fulfillment

Als Basis der Maßgröße für die Verteilung der Kosten auf Kostenstellen und Aktivitäten wurde in einem nächsten Schritt die Mitarbeiteranzahl auf Basis von Vollzeitäquivalenten (Full-Time Equivalents, FTEs) verwendet.

Durch Verwendung der Formel

$$(1) \frac{\Sigma(\text{Gemeinkosten } KST_i)}{\Sigma(\text{Maßgröße } KST_i)} * \text{Maßgröße}(\text{Aktivität}_j)$$

werden die Gemeinkosten auf die Aktivitäten j verteilt. Leitungskosten werden zudem über aggregierte FTE-Werte des Auftragmanagements und Request Fulfillment auf die Kostenstellen umgelegt. Für die Aktivität „Annahme und Dokumentation“ hat sich beispielsweise folgende Umlage der Gemeinkosten ergeben:

$$\text{Umlage} = \frac{1.074.274,49 \text{ €}}{12,8 \text{ FTE}} * 4 \text{ FTE} = 335.710,78 \text{ €}$$

Wie bereits beschrieben ist als Kostentreiber für das Auftragsmanagement nur die Anzahl der Aufträge geeignet, da jeder Auftrag abgeschlossen wird und somit alle Prozessschritte durchgegangen werden. Für die Ermittlung der Kostentreiber des Request Fulfillment werden die Anzahl der Störungen und die Erstlösungsquote berücksichtigt.

Mit diesen Daten werden im Anschluss die lmi-Kostensätze über die Formel

$$(2) \text{ Prozesskostensatz(lmi)} = \frac{\text{Prozesskosten lmi}}{\text{Prozessmenge lmi}}$$

berechnet. Für das Request Fulfillment hat sich folgender lmi-Prozesskostensatz ergeben:

$$\text{Prozesskosten} = \frac{335.710,78 \text{ €}}{29.478 \text{ Requests}} = 11,39 \text{ €/Request}$$

Anschließend wurden die leistungsmengenneutralen Kosten über die Formel

$$(3) \frac{\Sigma(\text{lmi Prozesskosten})}{\Sigma(\text{Gemeinkosten KST}_j)} * \text{Prozesskostensatz (Aktivität}_j)$$

berechnet. Für die Aktivität „Annahme und Dokumentation“ haben sich folgende lmi-Kosten (unter Berücksichtigung der Anzahl von Request) ergeben:

$$\text{Umlagesatz} = \frac{242.244,19 \text{ €}}{1.074.274,49 \text{ €}} * \frac{335.710,78 \text{ €}}{29.478 \text{ Requests}} = 2,46 \text{ €/Request}$$

Der Prozesskostensatz für die Aktivität „Annahme und Dokumentation“ wurde schließlich durch Addition der lmi- und lmi-Kosten berechnet:

$$\text{Gesamtprozesskosten}_j = 11,39 \text{ €} + 2,46 \text{ €} = 13,85 \text{ €}$$

Diese Berechnung wurde analog für alle in Table 20 dargestellten Aktivitäten im Auftragsmanagement und Request Fulfillment durchgeführt, um die aggregierten Gesamtprozesskostensätze durch Addition der Kostensätze der jeweiligen einzelnen Aktivitäten der Prozesse zu erhalten.

4 ERGEBNISSE

Das modifizierte Kalkulationsschema

Zunächst wurde das bestehende Kalkulationsschema modifiziert und strukturell an die Prozesskostenrechnung angepasst (vgl. Figure 17). Die größte konzeptionelle Veränderung stellt die Umlage der Servicefeld- und Bereichsleitungskosten dar. Diese erfolgt nicht mehr prozentual auf alle Vor-, Hilfs- und Produktkostenstellen, sondern auf Basis aggregierter FTE-Kennzahlen der beteiligten Personalkostenstellen. Darüber hinaus werden die vormals prozentualen Umlagen des Auftragsmanagements und Request Fulfillment durch Umlagen über €/Auftrag bzw. €/Incident ersetzt.

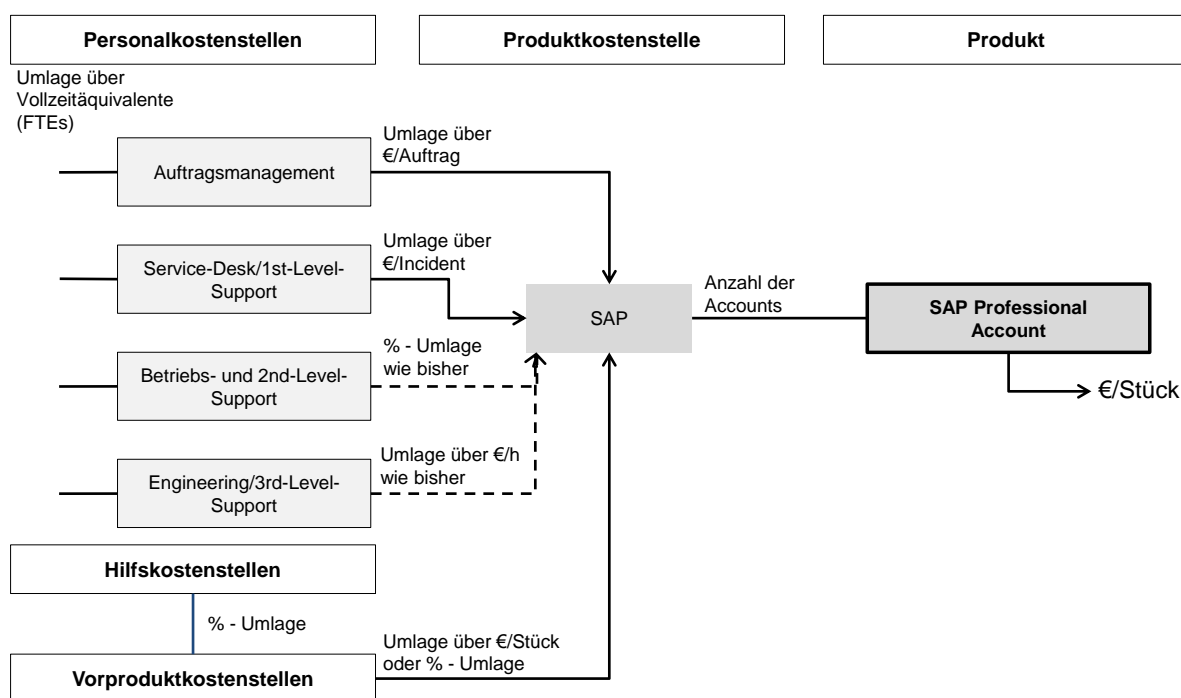


Figure 17: Modifiziertes Kalkulationsschema

Prozesskostensätze für Auftrags- und Incident Management

Die Prozesskosten wurden sowohl auf Gesamtbasis als auch auf lmi-Basis berechnet. In den Gesamtkostensätzen sind anteilig Leitungskosten enthalten. Diese fließen im bisherigen Kalkulationsschema über eine separate Umlage in die Gesamtkosten ein. Die vollständigen Ergebnisse können

Table 23 entnommen werden.

Prozess	Betrag
<i>Gesamtprozesskosten</i>	
Request Fulfillment	50,75 €
Auftragsmanagement	28,57 €
<i>Lmi-Prozesskosten</i>	
Request Fulfillment	41,73 €
Auftragsmanagement	22,79 €

Table 23: Gesamtprozesskosten und lmi-Prozesskosten

Über die Unterscheidung in Gesamt- und lmi-Prozesskostensätze können die Ergebnisse besser mit der IST-Kalkulation verglichen und die Abweichungen analysiert werden. Betrachtet werden die Abweichungen zwischen der bisherigen Umlage und der prozesskostenbasierten Verrechnung auf Basis absoluter Werte (vgl. Table 24) und auf Basis von Faktoren (vgl. Table 25). Die bisherigen Umlagen wurden als Expertenschätzung vorgenommen. Bei der Umlage der Prozesskosten wurden die jeweiligen Gesamtprozesskosten des Auftragsmanagements und des Request Fulfillment mit der Anzahl der Störungen (2200 Störungen in 2012) und der Anzahl der Aufträge (660 Aufträge in 2012) für den SAP-Account multipliziert.

Beschreibung	Umlage bisher	Umlage Prozesskosten
Auftragsmanagement	7.000 €	18.856 €
Request Fulfillment	63.064 €	111.650 €
Leitungskosten	61.000 €	0 € (in Prozesskosten enthalten)
Weitere Umlagen (System-Management, zentrale Datenbanken)	36.189,35 €	36.189,35 €
Gesamtumlage (ohne Primärkosten)	167.253 €	166.696 €
Belastung je SAP-Account	111,50 €	111,13 €

Table 24: Gegenüberstellung der bisherigen Umlagewerte mit den Werten aus der PKR

Beschreibung	Ausprägung
Abweichung Umlagen Auftragsmanagement	Faktor: 2,69
Abweichung Umlagen Request Fulfillment	Faktor: 1,77
Über Prozesskosten indirekt umgelegte Leitungskosten Abweichung Umlagen Servicefeld- und Bereichsleitung	absolut: 23.659 € Faktor: 0,38 (Berechnung: 23.659 € / 61.000 €)

Table 25: Abweichungen der Umlagen als Faktoren

Wie sich erkennen lässt, unterscheiden sich die Gesamtbeträge der Umlagen nur geringfügig voneinander und die Belastung eines SAP-Accounts durch Vor-, Hilfs- und Personalkostenstellen bleibt annähernd gleich (111,50 € vs. 111,13 €). Betrachtet man jedoch die Umlagen im Detail, sind wesentliche Differenzen zu erkennen. Nach Prozesskostenmethodik ist die Umlage des Request Fulfillment um das 1,77-fache und die des Auftragsmanagements sogar um das 2,69-fache höher. Die starke Abweichung kommt dadurch zustande, dass in den Kosten je Auftrag bzw. je Störung anteilige Leitungskosten enthalten sind. In dem modifizierten Kalkulationsschema wird auf eine direkte Umlage von Leitungskosten auf die Kostenstelle SAP verzichtet.

Die Ursache für die dennoch geringe Abweichung bei der Gesamtumlage ist bei der dritten Größe, den Leitungskosten, zu suchen. Nach der Prozesskostenrechnung wird die Produktkostenstelle SAP mit anteiligen Leitungskosten von ca. 23.659 € belastet. Diese werden indirekt über die Gesamtprozesskostensätze auf SAP umgelegt. Dem stehen im IST-Kalkulationsschema anteilige Leitungskosten von 61.000 € gegenüber. Nach Prozesskostenmethodik betragen die Overheadkosten lediglich ein gutes Drittel der Kosten aus der bestehenden Kalkulation (Faktor 0,38).

5 DISKUSSION UND INTERPRETATION DER ERGEBNISSE

Diskussion der Vor- und Nachteile der Prozesskostenrechnung bei ALPHA

Ein entscheidender Vorteil der Prozesskostenrechnung im Vergleich zu traditionellen Kostenrechnungssystemen besteht darin, die tatsächlichen Kosten der betrachteten Prozesse differenziert zu erfassen. Zwar unterscheidet sich die Prozesskostenrechnung von der bestehenden

Kalkulation in ihrer Gesamtsumme nur minimal, jedoch sind die Einzelumlagen bei der bestehenden Kalkulation falsch, da sie oftmals vor dem Hintergrund pragmatischer Gesichtspunkte gewählt wurden und somit zu verzerrten Ergebnissen führen (I1). Dies beruht auf der Tatsache, dass in dem betrachteten Fall ein sehr hoher Primärkostenanteil vorliegt, der u. a. durch dem Produkt direkt zurechenbare Wartungsverträge und Lizenzkosten zustande kommt. Dadurch sind die Umlagen der Leitungskosten deutlich höher. Bei Kostenstellen mit geringem Primärkostenanteil ist dies nicht der Fall (I2). Die Vorteile der Prozesskostenrechnung konnten im betrachteten Projekt vorrangig in der Qualität und der Aussagekraft des Kostenmanagements erkannt werden. Über die Prozesskostenrechnung werden die Kosten differenzierter erfasst. Dies hat sowohl einen positiven Effekt auf das interne Rechnungswesen als auch auf die Angebotserstellung, da potenziellen Kunden die Kosten nachvollziehbar präsentiert werden können. Des Weiteren ermöglicht der Einsatz der Prozesskostenrechnung die Definition eines Mengengerüsts für Dienstleistungen, wie z. B. dem Anwendungsbetrieb, wodurch der Ressourcenbedarf besser abgeschätzt werden kann. Ferner erlaubt die Kenntnis der Einflussgrößen auf Kosten des Unternehmens, diese zu reduzieren. Bezogen auf den Anwendungsbetrieb bedeutet dies Folgendes: Wird die Erstlösungsquote verbessert oder ein geringerer Anteil an Störungen an den 2nd-Level-Support weitergeleitet, können die Kosten gesenkt werden (I1). Dennoch bleibt die Anforderung der hohen Leistungsbereitschaft für Cloud Computing-Anbieter bestehen, um Belastungsspitzen jederzeit gewachsen zu sein.

Ein weiterer Nutzen besteht darin, dass die im Zuge der Prozesskostenrechnung generierten Kennzahlen ein Benchmarking ermöglichen (I1). Dabei kann der Vergleich nicht nur auf Basis aggregierter Zahlen, sondern z. B. anhand von Ticket- oder Prozesskosten, erfolgen. Tendenziell höhere Prozesskosten können ein Anzeichen für Defizite (z. B. längere Bearbeitungszeiten oder niedrigere Erstlösungsquoten) sein. Die Prozesskostenrechnung liefert hierbei Vorschläge für mögliche Kennzahlen, welche in die Entwicklung neuer Benchmarks einfließen müssen und die Anpassung bestehender Kennzahlensysteme erfordern. Somit kann über die Verwendung der Prozesskostenrechnung die Herausforderung der Wirtschaftlichkeitsprüfung adressiert werden.

Indirekt werden auch die Preisgestaltung und die Wettbewerbsfähigkeit des Cloud Computing-Anbieters verbessert. Kennt ein Unternehmen die tatsächlichen Kosten und deren Zusammensetzung, wird die Planung genauer und weniger anfällig für operative Fehleinschätzungen. Dadurch können die Preisuntergrenzen besser ermittelt oder durch die Senkung der Prozesskostensätze verringert werden. Zu beachten ist an dieser Stelle allerdings, dass mit der Prozesskostenrechnung sowohl leistungsmengeninduzierte als auch leistungsmengenneutrale Kosten berücksichtigt werden und diese somit den Charakter einer Vollkostenrechnung erhält. Zur Bestimmung von Preisuntergrenzen ist es häufig sinnvoll, lediglich variable Kosten zu berücksichtigen.

Verallgemeinerung der gewonnen Erkenntnisse

Auf Basis der erzielten Erkenntnisse sollen im Folgenden die im zweiten Kapitel vorgestellten Herausforderungen diskutiert werden. Table 26 fasst daher die zentralen Herausforderungen und mögliche Lösungsansätze durch die Prozesskostenrechnung zusammen.

Bezogen auf die erste Herausforderung unterstützt die Prozesskostenrechnung Unternehmen darin, mehr Transparenz in Bezug auf das Dienstleistungsangebot aufzubauen. Die Prozesskostenrechnung setzt eine Aktivitätenanalyse voraus, in der jede mit der Dienstleistungserbringung verbundene Aktivität identifiziert und beschrieben werden muss. Zudem werden durch die Berechnung der Prozesskostensätze Prozessmengen und Ressourcenbedarfe trans-

parent. Grundvoraussetzung an dieser Stelle ist jedoch eine bereits prozessbasierte Organisation des Unternehmens, was im vorliegenden Unternehmen durch eine weitgehende ITIL-Konformität gegeben war.

Bezogen auf die Intransparenz der Betriebskosten bleibt die Grundproblematik jedoch bestehen. Auch die Prozesskostenrechnung setzt voraus, dass Kosteninformationen bereits vorhanden sind bzw. in Kostenrechnungssystemen existieren. Ist dies nicht der Fall, so müssen Größen für die Prozesskostenrechnung geschätzt werden, was nicht dem Charakter der Prozesskostenrechnung entspricht.

Da in dem vorliegenden Beispiel nur „relativ“ standardisierte Prozesse betrachtet wurden, konnte ferner keine Lösung für die dritte Herausforderung gefunden werden. Hochgradig individuelle Prozesse können nicht mit der Prozesskostenrechnung abgedeckt werden. Um dennoch die Möglichkeit der Individualität mittels der Prozesskostenrechnung abzubilden, können Cloud-Computer-Anbieter versuchen, ihr Leistungsportfolio so weit wie möglich modular aufzubauen, um individuelle Lösungen auf Basis standardisierter Prozesse anbieten zu können.

Hinsichtlich der vierten Herausforderung wurden im vorliegenden Projekt alle Kundenanfragen als identisch betrachtet. Im Falle von kundenindividuellen Anfragen, welche durch existierende Standardprozesse nicht bearbeitet werden können, treten ähnliche Probleme, wie in der dritten Herausforderung auf.

In Bezug auf das Pricing können mit der Prozesskostenrechnung jedoch Lösungsansätze vorgestellt werden. Durch die Definition von Kosteneinfluss- und Prozessbezugsgrößen kann eine transparentere Kostenstruktur erreicht werden. Diese Transparenz und die Kenntnis über Mengengerüste kann verwendet werden, um ein verursachungsgemäßes Pricing (z. B. anfragebasiertes Zahlungsmodell) umzusetzen.

Im Hinblick auf die sechste Herausforderung erlaubt die Prozesskostenrechnung, Kennzahlen für Personalführungs- und Anreizsysteme abzuleiten. Zudem ermöglicht die Prozesskostenrechnung, Benchmarks über den Zeitverlauf und ggf. auch über Unternehmensgrenzen hinweg durchzuführen.

Nr.	Herausforderung	Lösung durch den Einsatz der Prozesskostenrechnung
1	Intransparenz des Dienstleistungsangebotes	<ul style="list-style-type: none"> • Aktivitätenanalyse trägt zum besseren Verständnis der Dienstleistung bei. • Ermittlung von Prozessmengen • Ressourcenbedarf und Kosten werden transparent
2	Intransparenz der Betriebskosten	<ul style="list-style-type: none"> • Grundproblematik bleibt bestehen • Abschwächung über Ermittlung von Kostentreibern für jeden Prozess als Stellschrauben für Kostensenkungen
3	Hohe Individualität der Angebote	<ul style="list-style-type: none"> • Prozessorientierung und Prozessanalyse zentraler Gegenstand • Definition von Standardkomponenten auf Sach- und Dienstleistungsebene • Erfassung der Ausbringungsmenge möglich
4	Hohe Abhängigkeit vom Kunden	<ul style="list-style-type: none"> • Schaffung Kostentransparenz je Output-Prozess • Indirekte Verbesserung durch Kostentransparenz
5	Problematische Preisgestaltung	<ul style="list-style-type: none"> • Erfassung der tatsächlichen Kosten je Output-Größe • Nutzungsbasiertes Pricing möglich
6	Keine geeigneten Personalführungs- und Anreizsysteme	<ul style="list-style-type: none"> • Lieferung von Vorschlägen für Kennzahlen • Benchmarks möglich

Table 26: Lösung spezifischer Herausforderungen durch die Prozesskostenrechnung

6 FAZIT

In dem Fallbeispiel wurden Prozesskostensätze exemplarisch für das Auftragsmanagement und das Request Fulfillment ermittelt. Wie die Studie zeigt, können die tatsächlichen Kosten transparenter und differenzierter erfasst werden, wodurch die Aussagefähigkeit, die Planbarkeit und letzten Endes die Gesamtqualität des Controllings verbessert wird.

Grundsätzlich ist aus Sicht des Praxispartners der Einsatz der Prozesskostenrechnung für alle Betriebsprozesse, die ein gewisses Mindestmaß an Standardisierung ausweisen, sinnvoll (I1, I2). Es ist durchaus denkbar, das Kalkulationsschema zu erweitern und Prozesskostensätze für das Access, Event und ggf. Problem Management zu ermitteln. Jedoch sollte berücksichtigt werden, dass insb. Prozesse des Problem Managements weniger gut standardisierbar sind und deren Abbildung deutlich komplexer ist.

Ein Kritikpunkt an der Prozesskostenrechnung ist die Abwägung von Aufwand und Nutzen. Zwar bietet die Prozesskostenrechnung deutliche Vorteile im Vergleich mit anderen Kostenrechnungssystemen, setzt aber voraus, dass Prozesse bereits definiert und beschrieben sind sowie umfassende Daten zu den Prozessen erfasst, aufbereitet und permanent gepflegt werden. In vielen Fällen sind Prozessdefinitionen zu einem bestimmten Grad schon vorhanden und Daten in verschiedenen IT-Systemen hinterlegt. Wenn die Auswertung der Daten automatisiert bzw. teilautomatisiert implementiert werden kann, ist der effiziente Einsatz der Prozesskostenrechnung, wie beim Praxisunternehmen gesehen, im Cloud Computing-Kontext sehr gut möglich.

PUBLICATION 6**Finanz- und Rechnungswesen an deutschen Flughäfen: Eine Fallstudie zur Optimierung kaufmännischer Kernprozesse⁶***Alexander Herzfeldt, Christoph Ertl*

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Globale Veränderungen der Luftverkehrsbranche führen zu einer verschärften Wettbewerbssituation für deutsche Flughäfen. Um dieser Wettbewerbssituation zu begegnen, werden vielfach Kostensenkungsprogramme zur Sicherstellung der Finanzkraft für Optimierungs- und Erweiterungsinvestitionen durchgeführt. Basierend auf einer Fallstudie an einem großen deutschen Flughafen sowie Erfahrungen aus Beratungsprojekten an drei weiteren Flughäfen werden in diesem Artikel zwölf Lessons Learned zur Kostensenkung und –optimierung im Finanz- und Rechnungswesen vorgestellt.

1. ZUNEHMENDER KOSTENDRUCK AN DEUTSCHEN FLUGHÄFEN

Die Verlagerung globaler Luftverkehrsströme in Richtung Osten, vor allem in die Golfstaaten, verändert die Wettbewerbssituation im europäischen Flughafenumfeld (Vgl. O’Connell, 2011). Dies hat zunehmend Auswirkungen auf deutsche Flughäfen, denn die Fluggesellschaften geben den Kostendruck aus dem Wettbewerb mit den neuen Konkurrenten, u.a. in Form von reduzierten oder stark nachverhandelten Leistungsbeziehungen mit den Flughafenbetreibern, weiter. Darüber hinaus führt die Deregulierung des Flughafenmarktes durch die Europäische Kommission, z.B. durch die Liberalisierung von Bodenverkehrsdiensten, ebenfalls zu einer verschärften Wettbewerbssituation an deutschen Flughäfen (Vgl. Littlechild, 2012). Um diesen veränderten Bedingungen zu begegnen, führen Flughäfen vielfach Kostensenkungsprogramme ein (Vgl. Suzuki et al., 2012; Voltes-Dorta/Pagliari, 2012). Bei der Durchführung der Kostensenkungsprogramme ist jedoch zu beachten, dass viele Aufgaben und Funktionen branchenspezifisch sind und sich in Teilen wesentlich von Aufgaben und Funktionen typischer Produktionsunternehmen unterscheiden (Vgl. Graham, 2014). Dies trifft auch auf den in dieser Fallstudie untersuchten Flughafen sowie auf die drei Flughäfen, mit denen die Ergebnisse dieser Fallstudie trianguliert wurden, zu. Die Flughäfen verfügen über eine jährliche Kapazität zwischen 5 und 50 Millionen Passagieren. Im Jahr 2014 erwirtschafteten sie einen Jahresumsatz von 100 Millionen Euro bis 1 Milliarde Euro. Das kompetitive Wettbewerbsumfeld zeigt sich auch in der erzielten EBIT-Marge der für die Fallstudie ausgewählten Flughäfen, die zwischen -40% und +20% liegt.

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Dem Finanz- und Rechnungswesen von Flughafenunternehmen liegt kein traditioneller Herstellungsprozess von Gütern zugrunde. Flughäfen realisieren ihre Erlöse durch die Bereitstellung von Infrastruktur und Dienstleistungen in den Bereichen Aviation (Gebühren und Entgelte für Start und Landungen von Flugzeugen) und Non-Aviation (u.a. Mieterträge, Erbringung von Technikleistungen, Consumer Activities) (Vgl. Müller, 2013). Eine Literaturrecherche zeigt, dass trotz der sehr branchenspezifischen Aufgaben und Funktionen bisher nur wenige Beiträge zum Thema Flughafenmanagement und insbesondere zum Thema Finanz- und Rechnungswesen an Flughäfen verfasst wurden (Vgl. Jarach, 2001; Seiringer, 2012; von Dietman, 2008). Vor allem Studien (Vgl. BDL, 2013; Roland Berger, 2013) fassen meist die Perspektiven von Flughäfen und Fluggesellschaften zusammen, sodass diese Ergebnisse nicht direkt vom Flughafenmanagement angewandt werden können.

Im Folgenden werden daher zwölf Lessons Learned zur Kostensenkung im Finanz- und Rechnungswesen an deutschen Flughäfen vorgestellt. Die Lessons Learned sind aus einer praxisbezogenen Fallstudie abgeleitet.

2. UNTERSCHIEDE ZWISCHEN UNTERNEHMEN DER FLUGHAFENBRANCHE UND TRADITIONELLEN PRODUKTIONSUNTERNEHMEN

Die Flughafenbranche ist durch ihr enges Verhältnis zu Luftverkehrsgesellschaften geprägt (Vgl. Fu et al., 2011). Während Flughäfen in der Vergangenheit direkt am Wachstum der etablierten deutschen Fluggesellschaften partizipieren konnten, hat sich diese Situation in den letzten zehn Jahren vor allem wegen den überproportional stark wachsenden Fluggesellschaften aus Golfstaaten verändert (Vgl. Bush/Starkie, 2014). Diese haben mittlerweile nennenswerte Anteile im deutschen Markt eingenommen und führen zu einer neuen Form des Wettbewerbs für die heimischen Fluggesellschaften (Vgl. O'Connell, 2011). Dieser Druck im Markt führt dazu, dass die Fluggesellschaften ihre Kostenstrukturen ganzheitlich prüfen und dabei auch die Stationskosten an den verschiedenen Flughäfen kritisch analysieren. Hier ist insbesondere zu bemerken, dass nach einer von von Dietman (2008) zitierten Studie die Umsatzrendite der Top-100-Flughäfen mit 11,4% deutlich höher als die Umsatzrendite von führenden Luftverkehrsgesellschaften (0,4%) ist.

Eine weitere Herausforderung des Flughafenmanagements ergibt sich zudem aus der Eigentümerstruktur an deutschen Flughäfen (Vgl. Adler/Liebert 2014). Im Gegensatz zu traditionellen Produktionsunternehmen sind die deutschen Flughäfen meist durch mehrheitlich öffentliche Anteilseigner (Städte, Länder, Bund) gekennzeichnet. Obwohl die Leitung der Flughäfen weitgehend privatwirtschaftlich geregelt ist, greift die öffentliche Hand vielfach in Geschäftsentscheidungen überentsprechende Mandate in den Aufsichtsgremien ein und wägt diese in einem politischen Entscheidungsprozess ab. Daher haben neben betriebswirtschaftlichen auch politische Aspekte einen wesentlichen Einfluss auf das Flughafenmanagement (Vgl. Seiringer, 2012).

Mit dem öffentlichen Anteilseigner richtet sich zudem die Entlohnung der Beschäftigten an deutschen Flughäfen nach dem Tarifvertrag des Öffentlichen Dienstes (TVöD). Den Sicherheiten, die der TVöD den Beschäftigten auf der einen Seite gibt, stehen Herausforderungen hinsichtlich Arbeitszeit- und Vergütungsmodellen für das Flughafenmanagement auf der anderen Seite gegenüber. Der TVöD sieht beispielsweise wenig Spielraum bei der Verhandlung

von Gehältern vor und beinhaltet kaum Möglichkeiten eines leistungsorientierten Anreizsystems für die Mitarbeiter. So gestaltet es sich für deutsche Flughäfen zunehmend schwierig, geeignete Nachwuchstalente für Aufgabengebiete mit ausgeprägtem Fachkräftemangel, z.B. im IT- oder Finanzbereich, zu finden.

Die Aufgaben und Funktionen deutscher Flughäfen weichen klassischerweise stark von den Aufgaben und Funktionen typischer Produktionsunternehmen ab. Im Debitorenmanagement werden zu verrechnende Leistungen beispielsweise in flugabhängige und flugunabhängige Leistungen unterteilt. Ein Auszug typischer Aufgaben des Debitorenmanagements aus einem Kundenprojekt wird in Table 27 aufgezeigt. An Tabelle 1 ist zu erkennen, dass die Rechnungsstellung auch mit Aufgaben der Rechnungsvorbereitung, Leistungsscheinerfassung und Qualitätskontrolle verbunden ist.

Flugabhängige Leistungen	Flugunabhängige Leistungen	
	Fracht	Allgemein
Bearbeitung Tagesliste Flugereignisse	Monatliche Abrechnung	Verrechnung der Leistungen Mitarbeiterparken
Turnusmäßige Rechnungs- läufe Großluftfahrt und allgemeine Luftfahrt	Tarife anlegen und pflegen	Abrechnung Leistungen Flughafensicherheit
Pflege der Emissionstabelle	Umrechnungskurse pflegen	Verrechnung Besucherführungen
Bearbeitung Neuaufnahmen Luftfahrzeuge	Charges Collect	Allgemeine Reklamationsbearbeitung
...

Table 27: Übersicht Leistungsverrechnung Debitorenmanagement (Auszug)

Im Kreditorenmanagement werden die Eingangsrechnungen aller Bereiche erfasst. Rechnungen werden von der Poststelle weitergeleitet bzw. elektronisch empfangen und entsprechend der Rechnungsart verarbeitet. Eingangsrechnungen können beispielsweise in folgende Arten unterteilt werden: Rechnungen mit Wareneingang und Bestellung, Rechnungen mit Bestellung aber ohne Wareneingang (z.B. Handwerkerleistungen), Rechnungen ohne Bestellungen (z.B. Ad-hoc-Bestellungen aus Fachabteilungen) und Rechnungen für Fremde (z.B. Kostenübernahme von Schallschutzmaßnahmen bei Flughafenwohnern).

Zudem sind weitere Funktionen des Finanz- und Rechnungswesens zu berücksichtigen. Dazu gehören neben dem Liquiditäts- und Forderungsmanagement sowie der Anlagenbuchhaltung auch Jahresabschlussarbeiten und die Überwachung der Steuer- und Grundbescheide. Außerdem führen Tätigkeiten wie Nachbearbeitungen von Vorkontierungen, Reklamationsbearbeitung im Debitorenmanagement und Verrechnungen von Telefongebühren zu wesentlichem Bearbeitungsaufwand. Auch werden an vielen Flughäfen im Finanz- und Rechnungswesen fachfremde Aufgaben wie z.B. Behördenmanagement (u.a. Vorbereitung von Sachverhalten für Klageverfahren, Betreuung von IT-Systemen), durchgeführt.

Vor allem diese Vertragsverhältnisse mit staatlichen Behörden (u.a. Bundespolizei und Zoll) führen zu einem erheblichen Steuerungsaufwand im Finanz- und Rechnungswesen von

Flughäfen, denn die Verrechnung von Leistungen an Behörden darf maximal zu Selbstkosten erfolgen, oder, falls die Marktkosten geringer sind, zu diesen. Dies bedeutet, dass für jede Leistung eine detaillierte Kalkulation auf Basis von Ist-Kosten zur Verfügung gestellt werden muss. Andernfalls werden die Kosten von den Behörden nicht anerkannt. Dieser Nachweis im Zuge einer regelmäßig stattfindenden Preisprüfung erfordert ein hohes Maß an Organisation und Transparenz in den Prozessen des Finanz- und Rechnungswesens.

3. FALLSTUDIE ZUM FINANZ- UND RECHNUNGSWESEN AN VIER DEUTSCHEN FLUGHÄFEN

Die Fallstudie wurde primär an einem großen süddeutschen Flughafen durchgeführt. Die Ergebnisse wurden anschließend mit Erfahrungen, die in Beratungsprojekten an drei weiteren deutschen Flughäfen gemacht wurden, trianguliert. Wesentliche Ergebnisse der Fallstudie basieren auf Projektergebnissen und empirischen Erfahrungen von zwei Flughafenmitarbeitern aus dem Finanz- und Rechnungswesensbereich sowie von drei Unternehmensberatern, die über einen Zeitraum von 2005 bis 2014 verschiedene Projekte im Finanz- und Rechnungswesen an den jeweiligen Flughäfen begleitet haben (vgl. Table 28). Zur Datenerhebung wurden semi-strukturierte und halb-offene Interviews durchgeführt. Die Datenerhebung wurde im Zeitraum zwischen Juni 2012 und Juli 2015 durchgeführt. Zudem sind in die Fallstudie die Erfahrung der Autoren und die Erkenntnisse aus hunderten von Gesprächen mit Mitarbeitern verschiedener deutscher und internationaler Flughäfen eingegangen.

Berufsbezeichnung	Unternehmen	Berufserfahrung
Leiter IT-Controlling	Süddeutscher Flughafen	>20 Jahre
Teamleitung Controlling	Süddeutscher Flughafen	>15 Jahre
Berater (Partner)	Weltweit agierende Unternehmensberatung	>25 Jahre
Berater (Partner)	Europäische Beratung	>15 Jahre
Berater	Weltweit agierende Unternehmensberatung	>5 Jahre

Table 28: Übersicht der ausgewählten Gesprächspartner für die Fallstudie

4. EINSICHTEN IN DAS FINANZ- UND RECHNUNGSWESEN AN DEUTSCHEN FLUGHÄFEN

Im Folgenden werden Einsichten in das Finanz- und Rechnungswesen an deutschen Flughäfen zusammengefasst. Alle Einsichten stellen eine Generalisierung der Erfahrungen der Interviewpartner und Autoren dar, müssen selbstverständlich aber nicht auf jeden einzelnen untersuchten Flughafen im Detail zutreffen.

4.1 Debitorenmanagement

In allen Projekten wurde ein hoher Anteil manueller Tätigkeiten aufgedeckt. Eine wesentliche Ursache für manuelle Tätigkeiten in der Debitorenrechnung ist die Komplexität der Gebühren- und Entgeltordnung. Die primär eingesetzten IT-Systeme im Debitorenmanagement sind

überwiegend für den Einsatz in Produktions- und Dienstleistungsunternehmen mit einem deutlich geringeren Grad an Abrechnungsvorgaben konzipiert. Einige Gebührenregelungen sind nicht bzw. nur mit großem Aufwand systemtechnisch abbildbar. An dieser Stelle tritt häufig ein Negativkreislauf in Gang: Da nicht alle Regelungen hinterlegt werden können, vertrauen Mitarbeiter dem System nicht und pflegen keine neuen Gebührenelemente bzw. Änderungen in das System ein. Nach einiger Zeit deckt das System nur noch einen kleinen Teil der Gebühren- und Entgeltordnung korrekt ab und die Mitarbeiter gehen vollständig zu manuellen Prozessen zurück.

In allen Projekten war zu beobachten, dass keine einheitlichen Rechnungsstandards existieren. Vielfach lassen sich Flughäfen Modalitäten der Abrechnung (Abrechnungszeitpunkte, Rechnungsaufbau, Rechnungsform) von ihren Kunden vorgeben. Die Erfüllung dieser Modalitäten ist sehr zeitaufwendig. Auch fehlen vielfach Konsistenzfilter für die Rechnungserstellung, was zu telefonischem Abstimmungsaufwand zur Vervollständigung von Angaben auf Leistungsscheinen führt. Fehlende IT-Systemschnittstellen führen zudem zu umständlichen Kopierarbeiten von Leistungsscheinen zwischen verschiedenen Systemen. Einige Flughäfen erfassen Leistungsscheine von einzelnen Abteilungen sogar vollständig manuell.

Problematisch bei der Rechnungserstellung ist, dass viele Mitarbeiter trotz vorhandener Systeme weiterhin in „manuellen Prozessen“ denken und das System oft als eine als Ursache für Doppelarbeit ansehen. Ebenfalls nehmen Mitarbeiter vielfach das digitale Archivierungssystem nicht an. Obwohl alle Rechnung und Leistungsscheine im System digital hinterlegt werden können, werden diese noch einmal ausgedruckt und in Ordnern archiviert.

Die wesentlichen Herausforderungen im Debitorenmanagement sind für viele Flughäfen somit in einer fehlenden IT-Unterstützung sowie in einer mangelnden Systemakzeptanz der Mitarbeiter begründet. Aufgrund fehlender Schnittstellen müssen Mitarbeiter des Debitorenmanagements beispielsweise direkt auf Systeme der Fachabteilungen (z.B. Parkhaussysteme, Sicherheitsausweisverwaltung) zugreifen. Hierfür sind die Mitarbeiter jedoch meistens nicht geschult. Auch kann es in diesen Fällen zu Compliance-Problemen kommen, wenn das Berechtigungssystem mehreren Mitarbeitern einen umfassenden Zugriff auf personen- oder kundenbezogene Daten ermöglicht und dadurch nicht mehr den datenschutzrechtlichen Bestimmungen entspricht.

Auch ist anzumerken, dass in den untersuchten Flughäfen die Verantwortlichkeiten für Innovationstreiber zur Automatisierung von Verrechnungsschritten nicht geregelt sind. Während sich Mitarbeiter des Finanz- und Rechnungswesens nicht in der Verantwortung sehen die Möglichkeiten der Prozessautomatisierung durch Software auszuloten, sieht sich die IT-Abteilung nicht in der Verantwortung das Debitorenmanagement auf weitere Funktionen der Software hinzuweisen bzw. diese einzurichten. Schließlich fehlt es vielen Mitarbeitern vielfach an IT-Wissen, was häufig zu einer geringen Systemakzeptanz führt.

4.2 Kreditorenmanagement

Als wesentlicher Aufwandstreiber im Kreditorenmanagement konnten Vorkontierungen erkannt werden. Weil die Fachabteilungen nicht in der Vorkontierung geschult sind, sind Bedarfsmeldungen aufwendig durch Mitarbeiter des Kreditorenmanagements zu überarbeiten.

Zudem sehen viele Abteilungen nicht sich, sondern das Kreditorenmanagement in der Verantwortung Bedarfsmeldungen zu erstellen.

Weitere Probleme entstehen bei der Bearbeitung von Eingangsrechnungen. Beginnend beim Rechnungseingang lässt sich feststellen, dass die Scansoftware vielfach fehleranfällig ist. Aufgrund fehlerhafter Felderkennung oder technischer Probleme wie die Erkennung von weißer Schrift auf schwarzem Hintergrund kommt es in diesem Prozessschritt bei der Mehrzahl der untersuchten Flughäfen zu aufwendigen manuellen Nachbearbeitungen. Bei der Nachbearbeitung selbst kommt es häufig durch eine ungeschickte Menüführung, einem wiederholten Wechsel zwischen Tastatur und Maus oder fehlenden Kopierfunktionen zwischen Feldern zu Zeitverlusten. Schließlich fehlen häufig Konsistenzfunktionen für die eigentliche Rechnungskontrolle. So kommt es z.B. zu einer fehlerhaften Zuordnung der vorkontierten Positionen zu den Positionen der Rechnungen.

Um diese Probleme zu vermeiden, sollten Systemschnittstellen zu Kunden und Fachabteilungen und einheitliche Rechnungsstandards geschaffen werden. Dies ist bisher jedoch nur in Ansätzen an wenigen Flughäfen umgesetzt. Ein elektronischer Datenaustausch (z.B. über EDI) mit Kreditoren findet nur in seltenen Fällen statt.

Analog zum Debitorenmanagement konnte auch bei den Mitarbeitern des Kreditorenmanagements öfters eine geringe Systemakzeptanz festgestellt werden. Neben fehlenden IT-Kenntnissen und einer insgesamt fehlenden IT-Affinität ist auch zu erwähnen, dass in vielen Unternehmen Mitarbeiter von Mitarbeitern lernen, es aber selten Schulungen von Externen gibt. So verändert oder erweitert sich der Wissensstand in einer Abteilung nicht und neue Funktionen können dadurch ungenutzt bleiben.

4.3 Weitere Funktionen und übergreifende Probleme

Neben dem Debitoren- und Kreditorenmanagement sind im Finanz- und Rechnungswesen an Flughäfen noch weitere Funktionen wie z.B. das Liquiditäts- und Forderungsmanagement, die Anlagenbuchhaltung sowie die Jahresabschlusserstellung durchzuführen. Im Vergleich zu den vier Projekten werden diese an den verschiedenen Flughäfen sehr unterschiedlich effizient durchgeführt.

Im Hinblick auf die Funktionen des Liquiditäts- und Forderungsmanagement lässt sich feststellen, dass diese an den untersuchten Flughäfen vorwiegend nicht systematisch durchgeführt werden. Bezogen auf das Liquiditätsmanagement wird in den meisten Fällen lediglich der tägliche bzw. wöchentliche Liquiditätsbedarf ermittelt und über Kreditlinien von Hausbanken abgerufen. An keinem der untersuchten Flughäfen wurde im Untersuchungszeitraum ein ganzheitliches Working Capital Management betrieben.

Die Anlagenbuchhaltung und die Jahresabschlusserstellung sind zudem vielfach sehr stark manuell geprägt. Zudem sind nur selten Checklisten oder wiederverwendbare Vorlagen für Zeitpläne vorhanden. Die Anlagenbuchhaltung wird zudem vielfach nicht unterjährig durchgeführt. So leisten die Mitarbeiter des Finanz- und Rechnungswesens am Ende des Geschäftsjahres meist viele Überstunden.

Bezogen auf das Rechnungswesen ist zudem festzustellen, dass vielfach eine nicht verursachungsgerechte Kostenrechnung in verschiedenen Bereichen und Abteilungen durchgeführt wird. In einem Projekt wurde die Einführung der Prozesskostenrechnung für ausgewählte Service-Support Prozesse zusammen mit dem IT-Controlling geprüft. Im Zuge der Berechnung von prozessspezifischen Kostensätzen für das IT-Auftragsmanagement sowie das Incident-Management wurde festgestellt, dass bei einer Erfassung der Kosten mit der Prozesskostenrechnung die Einzelumlagen deutlich von den Werten abweichen. Die Abweichungen im Vergleich zur der klassischen Zuschlagskalkulation betragen bis zu 169%. Insgesamt wurde festgestellt, dass die bisherigen Umlagen eher willkürlich gewählt wurden und dass die Prozesskostenrechnung es vor allem für standardisierte Prozesse erlaubt, die Kosten verursachungsgerechter zuzuordnen.

Zudem lassen sich im Finanz- und Rechnungswesen eine Reihe übergreifender Probleme erkennen. An vielen Flughäfen gibt es kein konsequentes Berechtigungskonzept, so dass das Anlegen von Stammsätzen und das Buchen nicht in allen Fällen konsequent voneinander getrennt sind. Hier kommt es zu erheblichen Compliance-Problemen durch Verletzung des Vieraugenprinzips. Weiter lässt sich feststellen, dass in den untersuchten Unternehmen vielfach ein stark abteilungs- bzw. bereichsbezogenes Denken stattfindet, weshalb keine abteilungsübergreifenden Workflows definiert und Zuarbeiten für andere Abteilungen meistens in geringer Qualität durchgeführt werden.

Wie bereits in Kapitel 2 beschrieben, existieren an deutschen Flughäfen vielfach wenige Anreizstrukturen für Mitarbeiter des Finanz- und Rechnungswesens. Auch wenn eine Entlohnung der Beschäftigten nach dem Tarifvertrag des Öffentlichen Dienstes einen nur geringen Spielraum für zusätzliche Anreize gibt, sollten Flughäfen dennoch versuchen diesen Spielraum auszuschöpfen. Bei einem süddeutschen Flughafen ließ sich z.B. erkennen, dass die Mitarbeiter durch Anreizstrukturen und eine entsprechende Unternehmenskultur bedeutend positiver gegenüber IT-Systemen eingestellt sind und auch bereit sind sich mit neuen Funktionen vertraut zu machen. Dies führt im Vergleich mit anderen Flughäfen zu einer gesteigerten Effizienz im Finanz- und Rechnungswesen

5. ZWÖLF LESSONS LEARNED ZUR OPTIMIERUNG DES FINANZ- UND RECHNUNGSWESENS AN DEUTSCHEN FLUGHÄFEN

In Table 29 werden die zwölf Lessons Learned zur Kostensenkung im Finanz- und Rechnungswesen aus der Fallstudie vorgestellt. Die Lessons Learned sind aus der Flughafenperspektive aufbereitet und können von der Abteilungs- bzw. Bereichsleitung Finanz- und Rechnungswesen sowie vom Flughafenmanagement angewandt werden, um den aktuellen Herausforderungen und insbesondere dem zunehmenden Kostendruck zu begegnen. Zur Vereinfachung der Anwendbarkeit werden die zwölf Lessons Learned den drei Handlungsfeldern Mitarbeiter, Governance und IT zugeordnet.

Nr.	Handlungsfeld	Lessons Learned	Erklärung
1	Mitarbeiter	Mitarbeiterschulungen zur Systemnutzung anbieten	Reduktion manueller Tätigkeiten durch konsequente Automatisierung von kaufmännischen Aktivitäten. Hierzu sollten Mitarbeiterschulungen angeboten werden, bei denen neben der Vermittlung verfügbarer Systemfunktionen auch der effiziente Umgang und die Integration der flughafenspezifischen IT-Systeme im Mittelpunkt stehen.
2	Mitarbeiter	Anreizstrukturen des TvöD ergänzen und Mitarbeiterqualifikation anbieten	Um ein nachhaltig effizientes Finanz- und Rechnungswesen zu ermöglichen, sollten Mitarbeiter durch die Einführung von „Fachkarrieren“ (in Kombination zu den Führungskarrieren) langfristig motiviert und an das Unternehmen gebunden werden. Dazu könnten die bestehenden Vergütungsmodelle z.B. durch außertarifliche Zulagen ergänzt und professionelle Mitarbeiterentwicklungsmaßnahmen (Job Enlargement und Job Enrichment) angeboten werden.
3	Mitarbeiter	Akzeptanz von IT-Systemen durch kontinuierlichen Verbesserungsprozess erhöhen	Eine hohe Effizienz des Finanz- und Rechnungswesen kann nur durch eine optimale IT-Unterstützung gewährleistet werden. Da Neuerungen im Tagesgeschäft vielfach Änderungen in der IT-Unterstützung erfordern, sollte ein kontinuierlicher Verbesserungsprozess für die IT-Systeme aufgesetzt werden. Vor allem sollten hier Verantwortlichkeiten für das Treiben von Innovationen definiert werden.
4	Governance	Gebühren- und Entgeltordnung standardisieren und Qualität erhöhen	Die Inhalte und Qualitäten der Gebühren- und Entgeltordnung sollten künftig stärker standardisiert und vereinheitlicht werden. So wäre z.B. mit der EASA (European Aviation Safety Agency) die Möglichkeit gegeben – ähnlich wie bei den Vorgaben zur Spezifikation der Flughafenorganisation, -sicherheit und –infrastruktur – ebenfalls europaweit einheitliche Regeln für die Ermittlung von Entgelten und Gebühren festzulegen. Die nationalen Luftfahrtbehörden könnten dann weiterhin eigenverantwortlich deren Höhe mit den Flughäfen und Airlines festlegen. Der Vorteil einer europaweit einheitlichen

			Vorgehensweise bestünde darüber hinaus darin, dass die Komplexität von flughafenspezifische IT-Abrechnungssysteme, basieren auf den Vorgaben der EASA, reduziert werden könnte.
5	Governance	Einheitliche Kontierungsrichtlinien und Checklisten vorgeben	Aufgrund der besseren Kenntnis über Geschäftsvorfälle kontieren bestellende Fachabteilungen vor. Durch Vorgabe einheitlicher Kontierungsrichtlinien und Checklisten kann der Abstimmungsaufwand zwischen Fachabteilungen und Kreditorenmanagement in der Beschaffung deutlich reduziert werden.
6	Governance	Einheitliche Rechnungsstandards vorgeben	Bei den meisten untersuchten Flughäfen existieren keine einheitlichen Rechnungsstandards. Zur effizienten Abwicklung von Ausgangs- und Eingangsrechnungen sollten Flughäfen Abrechnungszeitpunkte, Rechnungsaufbau und Rechnungsform bei allen Debitoren und Kreditoren vereinheitlichen.
7	Governance	Prozesskostenrechnung einführen	Das Controlling setzt eine möglichst detaillierte Aufschlüsselung von Kosten voraus. Eine Prozesskostenrechnung insbesondere bei repetitiven Prozessen ermöglicht eine verursachungsgerechte Kostenrechnung und eine gezielte Steuerung von Prozessen.
8	IT	Abteilungsübergreifende Workflows einführen	Ein Großteil der Tätigkeiten des Finanz- und Rechnungswesens erfordert die Interaktion mit anderen Fachabteilungen. Es sollten abteilungsübergreifende und von allen Fachabteilungen akzeptierte und gelebte Workflows eingeführt werden, um Prozesse des Debitoren- und Kreditorenmanagements effizient zu gestalten.
9	IT	Schnittstellen zu Systemen innerhalb und außerhalb der Finanzbuchhaltung optimieren	In der Finanz- und Rechnungslegung wird eine Vielzahl von Systemen verwendet. Um umständliches Kopieren und Mehrfacheingaben zu vermeiden, sollten Schnittstellen bzw. Import- und Exportfunktionen für alle genutzten Systeme eingerichtet werden. Auch sollten Systeme anderer Fachabteilungen bzw. Kunden zum einfachen Datenaustausch angebunden werden.

10	IT	Anteil digitaler Eingangs- und Ausgangsrechnungen erhöhen	Papierrechnungen führen zu manuellen und fehleranfälligen Prozessen. Durch Umstellung auf den digitalen Rechnungsempfang bzw. -versand entfallen Tätigkeiten der manuellen Rechnungsbearbeitung.
11	IT	Digitales Archivierungssystem einführen	Eine digitale Rechnungsarchivierung reduziert manuelle Archivierungstätigkeiten und bietet effiziente Suchmöglichkeiten. Beispielsweise in der Reklamationsbearbeitung können archivierte Rechnungen so deutlich schneller gefunden werden.
12	IT	Konsistenzfilter und automatische Qualitätsprüfungen einführen	Konsistenzfilter und automatische Qualitätskontrollen reduzieren manuelle Nacharbeit im Finanz- und Rechnungswesen. Beispielsweise falsche Eingabeformate, fehlerhafte Zuordnungen von Kontierungen oder fehlende Eingaben können so frühzeitig vom Nutzer erkannt und korrigiert werden.

Table 29: Handlungsfelder und Lessons Learned

6. FAZIT

Dieser Artikel beschreibt die Ergebnisse einer Fallstudie zur Kostensenkung im Finanz- und Rechnungswesen an vier deutschen Flughäfen. Zur einfacheren Anwendung werden die zwölf Lessons Learned den drei Handlungsfeldern Mitarbeiter, Governance und IT zugeordnet. Wesentliche Lessons Learned sind das Anbieten von Mitarbeiterschulungen zur effizienten Nutzung der flughafenspezifischen IT-Systemlandschaft, die Standardisierung bei der Gebühren- und Entgeltordnung und die Einführung von IT-gestützten abteilungsübergreifenden Workflows.

Diese Handlungsempfehlungen können von der Abteilungs- bzw. Bereichsleitung Finanz- und Rechnungswesen sowie vom Flughafenmanagement angewandt werden, um den aktuellen Herausforderungen und insbesondere dem zunehmenden Kostendruck zu begegnen

RELATED WORK – PUBLICATION 7**The Role of Individualization and Project Learning for Cloud Service Profitability⁷**

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ABSTRACT

This article describes how cloud computing has been one of the most important IT topics in recent years. In increasingly greater numbers, service providers have entered this dynamic market turning it into one of the most competitive markets in modern IT industry. As the market matures, many providers are struggling with profitability issues. Studies on cloud services have primarily approached the topic from a technical or customer's perspective, neglecting the provider's perspective. In this article, the authors address business aspects of cloud services from the provider's perspective. Based on an empirical study of 78 cloud service providers, they analyze the impact of service individualization and project learning on service delivery cost and profitability. The results indicate that while project learning merely helps to reduce service delivery costs, service individualization positively affects profitability.

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RELATED WORK – PUBLICATION 8**The Role of Value Facilitation Regarding Cloud Service Provider Profitability in the Cloud Ecosystem⁸**

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ABSTRACT

With the increasing maturity of cloud technologies and the growing demand from customers, the cloud computing ecosystem has been expanding continuously with both incumbents and new entrants, whereby it has become more distributed and less transparent. For cloud service providers previously focusing on growth strategies, it is now necessary to shift the attention to providing service efficiently, as well as profitably. Based on 14 explorative interviews with cloud service experts, the relationship between cloud service provider profitability and value facilitation, which stands for the capability to build up resources in advance of future customer engagements, is investigated. The results indicate a positive relationship between cloud service profitability and value facilitation and deliver valuable insights for both researchers and practitioners. In particular, guidelines on how to design profitable cloud service offerings are discussed.

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Appendix

The following tables provide additional details on the characteristics and the process of the literature review. Table A1 shows the taxonomy of the literature review based on six characteristics according to Cooper (1988).

Characteristic	Categories			
(1) Focus	Research findings	Research methods	Theories	Practices or applications
(2) Goal	Integration		Criticism	Identification of central issues
(3) Organization	Historical		Conceptual	Methodical
(4) Perspective	Neutral representation		Espousal of position	
(5) Audience	Specialized scholars	General scholars	Practitioners or policymakers	General public
(6) Coverage	Exhaustive	Exhaustive with selective citation	Representative	Central or pivotal

Table A1: Taxonomy of literature reviews (adapted from Cooper 1988)

The literature review considers the following journals: Accounting, Auditing & Accountability Journal (AAAJ), Abacus, Accounting Horizons (AH), Accounting Organizations and Society (AOS), Accounting Review (AR), British Accounting Review (BAR), Contemporary Accounting Research (CAR), Critical Perspectives on Accounting (CPA), European Accounting Review (EAR), International Journal of Public Sector Management (IJPSM), Journal of Accounting and Economics (JAE), Journal of Accounting Research (JAR), Journal of Management Accounting Research (JMAR) and Management Accounting Research (MAR), Measuring Business Excellence (MBR), Management Decision (MD), Public Management Review (PMR), Information Polity (IP), Government Information Quarterly (GIQ), Transforming Government: People, Process and Policy (TGPPP) and International Journal of Electronic Government Research (IJEGR).

Table A2 shows the number of found articles ('hits') in the different journals, in total 514. The column 'Relevance' indicates the number of articles that are considered for further analysis according the exclusion process of the literature review.

Journal	Database	Search term	Search fields	Hits	Relevance
Accounting, Auditing & Accountability Journal	Emerald Insight	'organizational change'	Title Abstract Keywords	31	1
Abacus	EBSCOhost			1	0
Accounting Horizons	EBSCOhost			0	0
Accounting Organizations and Society	Science Direct			57	8
Accounting Review	EBSCOhost			4	0
British Accounting Review	Science Direct			16	0
Contemporary Accounting Research	EBSCOhost			0	0
Critical Perspectives on Accounting	Science Direct			29	0
European Accounting Review	EBSCOhost			7	1
International Journal of Public Sector Management	Emerald Insight			83	0
Journal of Accounting and Economics	Science Direct			4	0
Journal of Accounting Research	Wiley Online Library			2	0
Journal of Management Accounting Research	AAA Digital Library			0	0
Management Accounting Research	Science Direct			58	4
Measuring Business Excellence	Emerald Insight			22	2
Management Decision	Emerald Insight			147	3
Public Management Review	EBSCOhost			18	0
Information Polity	EBSCOhost			3	0
Government Information Quarterly	EBSCOhost			20	0
Transforming Government: PPP	Emerald Insight			5	0
International Journal of e-Government Research	InfoSci-On Demand	7	0		
Total				514	19

Table A2: Summary of the literature review