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TOWARDS A FRAMEWORK TO STRUCTURE AND ASSESS STRATEGIC IT/IS MANAGEMENT

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Abstract

This paper proposes a reference framework for strategic IT/IS management (SITISM) that structures the fields of action and decision-making of senior IT managers. Since there have been approaches to do so in the past, we integrate models described in literature. We then use extensive field work to construct and evaluate our framework. We argue that structuring SITISM leads to comparability. Therefore we use our framework as a foundation to assess a corporate IT/IS department, thereby further evaluating our approach.

To prepare this assessment we have conducted a longitudinal study that uses a set of questionnaires derived from our proposed SITISM reference framework. The data gathered from 129 responses serves as a basis for the comparative assessment.

The suggested reference framework proves to be a viable approach to structure the domain of SITISM in various organizational settings, especially taking into account the market-oriented transition of IT/IS departments. We used an in-depth field study for evaluation purposes. It supports our suggestion that the framework allows for the comparability needed for assessment projects.

On these grounds, the research reported on in this paper contributes to the discipline of strategic IT/IS management by giving a new impulse to structure this complex and changing domain.

Keywords: Assessment, Design Research Methods & Methodologies, Frameworks & Models, Governance, IT Management, Strategic Management of IT and IS

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1 INTRODUCTION

The role of Information Technology (IT) and Information Systems (IS) departments in businesses has changed. While they formerly had a mainly internal service function within companies, they more and more adopt an active role in the IT/IS value chain by sourcing from suppliers and delivering to internal or external customers. This development becomes evident through the increase in IT/IS (out-)sourcing and off-shoring. The market-oriented transition of IT/IS departments, sometimes also termed as “industrialization of IT” (Zarnekow, Brenner and Pilgram, 2007), leads to a shift of focus from production to integration and from mastering technology to servicing customers.

This changing role and environment lead to new structures and requirements for strategic IT/IS management (SITISM). Today, understanding the business needs of the company and aligning the IT/IS-department’s efforts accordingly are central challenges for IT/IS managers. Together with the changing IT/IS value chain, this calls for new orientation: decision domains need to be adjusted and complemented, methods and solutions need to be restructured, and adapted governance needs to be implemented. While a lot of scientific attention was given to the strategic planning process in the past, structured approaches to investigate SITISM itself are still scarce (Brown, 2004; Teo and Ang, 2000).

One potential remedy is the use of reference frameworks. In various domains of IT/IS-management, e.g. project management with PMBOK by the PMI (Project Management Institute, 2004) or IT service management with ITIL by the OGC (Office of Government Commerce, 2007), the use of such standardized frameworks has led to a more professional approach in the discipline. A reference framework not only for special IT/IS disciplines but for strategic IT/IS management as a whole would allow businesses to structure their various related activities in order to make them measurable and comparable. This is important for two reasons: (1) IT/IS-departments have to prove to their internal or external customers that their offerings are competitive in terms of prices and quality and (2) both best practices and innovation potential have to be identified.

However, comparing always requires that the own, internal data is considered in relation with other organizations. The resulting relative measures are indicating whether an IT/IS-department is competitive. But such a comparison is difficult due to a complex environment characterised by constant transition, different industries, different business strategies, and different stages of development. Offering a standardized structure of the realm of IT/IS-departments from a senior management perspective, a reference framework for SITISM provides the basis for comparative studies in this field.

The objective of this paper is to propose such a reference framework for SITISM. It defines the core fields of action to be considered by senior IT/IS managers, e.g. in an IT/IS-strategy, and outlines their relationships. This framework can e.g. be used as (a) a guideline to measure the performance of SITISM, (b) a basis for developing SITISM action plans, (c) a structure for IT/IS management cockpits, and (d) a foundation for assessing SITISM in real-world settings including the comparison discussed above by using relative, generalized key performance indicators (KPIs).

This paper reports on our research efforts to develop, apply, and evaluate an instrument for structuring and assessing the domain of SITISM. Core of this will be a reference framework we are synthesizing both from an analysis of the literature in this field as well as from empirical observation and evaluation. By using this framework for assessments of real-world settings, we tested its applicability with a positive result. The main contribution of this paper thus lies in proposing our SITISM reference framework and describing its empirical evaluation.

Our paper is organized as follows. Section 2 introduces methodological foundations. Section 3 presents our reference framework for SITISM and provides an overview of the literature and the empirical observations we combined to initially construct it. Section 4 discusses the evaluation strategy we have chosen and shows which insights we gained by using our reference framework as a basis for assessing real-world SITISM. Section 5 serves to reflect the assessment capabilities of our suggested approach. Section 6 discusses limitations and provides an outlook on future research.

2 RESEARCH METHODOLOGY

Our research is based on the ideas of design science in IS research (March and Smith, 1995; Nunamaker, Chen and Purdin, 1990). More specifically, we developed a design approach for our reference framework following Hevner et al. (2004) and Hevner (2007).

First we conducted a *rigor cycle* (Hevner, 2007) by reviewing scientific literature (Fettke, 2006; Webster and Watson, 2002) about existing approaches to structure SITISM. The outcomes, together with input we received from subject-matter experts, served as a basis for the initial *design cycle* (Hevner, 2007), which is presented in section 3 together with more methodological details.

In section 4 we describe three approaches we took to evaluate our framework in the *relevance cycle* (Hevner, 2007): in the first iteration we conducted both a literature review and guided interviews, in the second iteration we did a benchmarking field study, while the third iteration was action research in the form of an assessment of a real-world SITISM. Further methodological details will, too, be presented in this section.

3 A FRAMEWORK FOR STRATEGIC IT/IS MANAGEMENT

The fundamental aim of our research is to better understand the challenges of strategic management of IT/IS departments within companies in the course of their transition to market-oriented structures, and, in a second step, to explore possible solutions to these challenges.

In order to govern, plan, steer, and control (or in brief, manage) the realm of IT/IS within organizations, a crucial prerequisite is the decision makers' shared perception of the relevant fields of action and decision making. This often (partly) implicit perception can be made explicit with the help of a framework for SITISM. Such a framework, if adequately designed, can lead to a mutually agreed and complete understanding of the necessary management tasks, can help to separate the different of concerns, and at the same time can offer an integrative perspective that shows all relevant fields of action as well as their interdependencies.

Applied to a larger number of organizations, the use of a shared framework for strategic IT/IS management facilitates the exchange of proven methods and best practices, improves the comparability of performance, and allows the repeatability of actions, as well as their measurement. It thus builds the foundation for an assessment and benchmarking of SITISM.

A reference framework can be regarded as a reference model on a high level of abstraction. In line with Thomas (2006), a reference model can be described as "a model used for supporting the construction of other models". The attribute of universality and the recommendation character, which are frequently mentioned in the literature, are critical regarding their general validity (Delfmann, 2006; vom Brocke, 2003). The two main advantages of using reference models are cost savings and quality improvements. These advantages are derived from the core idea of reusing model-inherent knowledge, due to the models being able to incorporate best practices and giving organizations an initial starting point (Fettke and Loos, 2003; Scheer and Nüttgens, 2000). Reference models and methods of reference modeling can be regarded as the results of the design science approach in information systems research (Winter and Schelp, 2006).

In order to build a point of reference and orientation for both scientists and practitioners and thereby achieve the above mentioned benefits, we deduced a set of requirements from the literature review and the practitioners' input on what a reference framework for SITISM needs to fulfill.

In terms of methodology, this first phase of our research process consisted of the aforementioned review of scientific literature. The results are summarized in section 3.1. We analyzed the frameworks we found with respect to their structural elements, the underlying requirements they address, and whether they have been empirically evaluated. In a second phase, one of the authors discussed the frameworks in a workshop, which was part of an IT-benchmarking initiative that we conducted (cp.

section 4.2). In this workshop with 16 senior IT managers and 8 experienced consultants in the field of SITISM, we asked the participants to assess the match between their experience regarding the required fields of action in SITISM and the elements provided by each of the frameworks. The result was that the participants found that all the frameworks contained valuable parts, but none of them was deemed to be complete and structurally fully adequate. In a next step, we asked the participants to list the requirements that a SITISM reference framework should fulfill, collected them, and determined the final list of requirements by voting on which requirements to maintain. The most important are:

- adequacy to and coverage of the considered realm of SITISM in a condensed way, to cope with the complexity,
- reflection of real-world organizational structures and established disciplines (e.g. IT/IS project management with distinct methodology, roles, organizational units, processes etc.),
- completeness of elements and at the same time ease of use and understanding, since the framework should support communication among its users,
- depiction of the fields action and decision-making as well as their interrelationships, to facilitate the identification of cause-effect chains in SITISM,
- reflection of the market-oriented transition of IT/IS departments,
- acceptance by senior IT/IS managers, and
- suitability to support the assessment and comparison of the SITISM across several companies as well as across time periods (e.g. fiscal years).

Keeping these requirements in mind, we now provide a brief overview of existing SITISM-related frameworks that we identified through our literature review.

3.1 Existing Frameworks

Since the academic literature mainly focuses on the process of strategic planning in IT/IS rather than on the content and structure of IT/IS strategies themselves (Brown, 2004; Teo and Ang, 2000), the works on actual models or frameworks for SITISM are as yet limited.

One of the most prominent suggestions was made by Earl (1989; 1996; 2000). He identifies three major domains that are covered by strategies in the domain of IT/IS: (1) *IS strategy*, which mainly deals with the management of the portfolio of applications and projects to satisfy a business's needs, (2) *IT strategy*, which essentially deals with the technology used to deliver the applications and projects characterized by the IS strategy, and (3) *information management (IM) strategy*, which implies the governance structure required to coordinate IS and IT strategy with each other and business in general.

In contrast to Earl's approach to identifying the domains of IT/IS strategy, other authors (e.g. Boddy, Boonstra and Kennedy, 2005; McLeod, 1998; Smits, van der Poel and Ribbers, 2003) deal with the role that IT/IS plays in a company's functional context. In this perception, IT/IS strategy is interpreted as being primarily a *functional, departmental strategy*. The central question here is how IT/IS strategy as one of a company's functional strategies can be properly aligned with others. A problem with this perception is that IT/IS often supports and is even integrated into multiple other functions and therefore cuts across traditional departmental boundaries. A clear functional delineation of the IT/IS strategy therefore often fails.

This view is shared by Mocker and Teubner (2005), who suggest an integration of the existing approaches. They identify two major domains in IT/IS strategy: (1) *information infrastructure strategy* and (2) *information function strategy*. The former includes a layered approach to combine IT infrastructure, IS, and information resource management to depict the essential offerings of an IT/IS entity. The latter entails the resources required to create these offerings.

A problem with the approaches discussed so far is that there is little or no empirical support for their findings. Their main arguments are based on a comparison of IT/IS strategy in the literature and comparison with the body of knowledge in the domain of business strategy. While Mocker and Teubner (2006; 2007) continue their work, they have not yet integrated their work into their framework.

Offering a more practical background, Weill and Ross (2004), in their work on IT governance, identify five interrelated decision-making fields that IT departments' top management need to master: *IT principles*, *IT architecture*, *IT infrastructure*, *business and application needs*, and *IT investment and prioritization* (Weill and Ross, 2004). Since the focus is on governance, important SITISM elements such as IT/IS processes and application development and maintenance are mainly omitted.

Österle, Brenner, and Hilbers (1993) provide a classification of areas of IS management concern. They identify *strategic guideline*, *IS framework*, *IS project portfolio*, *IS project*, and *IS support*. This approach concentrates on the IS level, while, for example, IT/IS processes, as well as governance and organizational issues are only partly covered or not at all.

In their model of the IT/IS department as part of the IT value chain, Zarnekow et al. (2007) not only point out the importance of interfaces with IT/IS suppliers, but also with internal/external customers. They describe the main tasks of IT/IS departments in this context as having to change from “plan, build, run” to “source, make, deliver.”

All the above-mentioned approaches offer valuable structures and elements to describe the realm of SITISM. However, when assessed on the basis of the previously mentioned requirements, none of these approaches fulfils them in full. More precisely, we could not find the combination of a good fit with the requirements of a *reflection of real-world organizational structures*, *completeness*, and a *reflection of the market-oriented transition of IT/IS departments* in any of the frameworks/approaches.

On the basis of these findings, we started the development of a new reference framework for strategic IT/IS management by using the information about the domains of SITISM, their relations, and their interactions as a basis for the design of the framework we suggest.

3.2 Synthesis of a new Framework for SITISM

To build the new reference framework, we started with the framing environment of business strategy, customers, and suppliers which is e.g. also found in Zarnekow et al. (2007). We then filled in the elements that the practitioners in our workshop deemed to be important, which led to a first draft. By using input from IT/IS executives, we regard our integration of frameworks to be valuable in two ways: (1) an integration of separate models and concepts more clearly illustrates the current state-of-the-art in structuring SITISM and (2) using empirical material in the construction phase ensures both validity, acceptance and viability of our framework when being applied to real organizations in the field.

Parallel to this, we mapped out the elements found in the existing scientific approaches, aggregated similar elements and thus formed a pool of elements to be considered. We then compared the first draft with this pool and took over those elements that were missing in the first draft, leading to a second draft. We presented this second draft to the group of practitioners in a further workshop, evaluated their feedback and refined the framework to a first version presented in figure 1.

This reference framework builds on the fundamental logic that contemporary IT/IS departments have three main interfaces (letters in brackets refer to the ID of the respective questionnaire):

- to the surrounding organisation with its *business strategy*, with which *strategic IT/IS directions* and *governance* (A) have to align with (this refers to business–IT alignment as described by e.g. Henderson and Venkatraman, 1992). To implement the strategic directions, IT executives have to manage the *financials* and implement *steering* mechanisms.
- to the internal and/or external *customers* (G) which order and consume the *delivered products and services*. These products and services are specified in quality, quantity, and price with the help of

delivery-side *service level agreements (SLAs)*, which the IT/IS department and its customers negotiate and agree upon.

- to the *suppliers (B)* which the IT/IS department is *sourcing products and services* from, which are defined in quality, quantity, and prize by supplier-side *SLAs*.

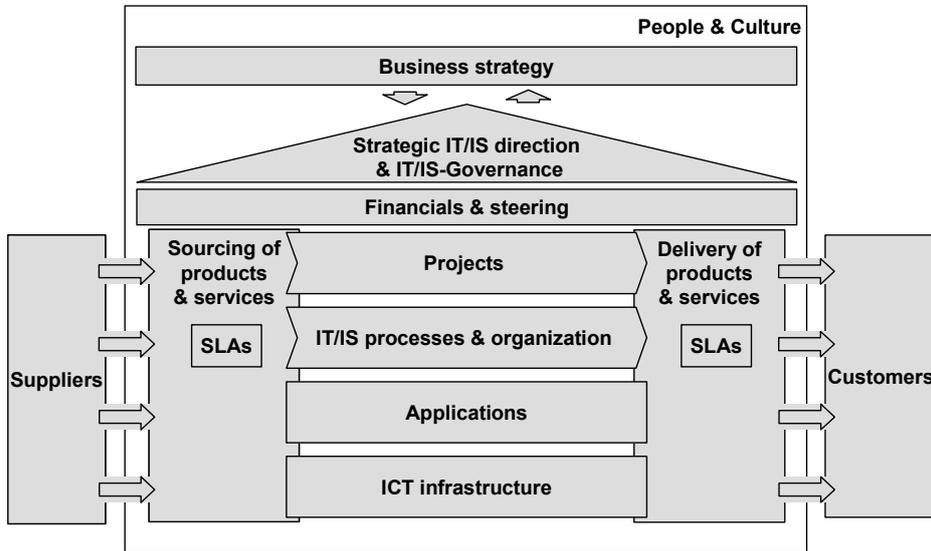


Figure 1 Proposed Reference Framework for SITISM

Surrounded by these three interfaces, senior IT managers have four central fields of action and decision-making, in which they can transform the sourced products and services into those they deliver, and by which they can implement the strategic IT/IS directions:

- managing the *project portfolio* (Project Management Institute, 2004), which includes program management and individual project management (F).
- defining and managing the *IT/IS processes* (e.g. according to the ITIL standard, compare Hochstein, Zarnekow and Brenner, 2005) and the *IT/IS organization* (E).
- managing the *application portfolio* (as for example described in Riempp and Gieffers-Ankel, 2007), which includes, among others, the planning of the enterprise architecture, application integration, and application development and maintenance (C).
- managing the *ICT infrastructure* with networks, data centres, servers, client hardware, printers, telephony, etc. (D).

It was of special importance to the practitioners that the implementation of the strategic IT/IS directions in all other elements of the framework is strongly influenced by the *people and culture* of the overall organization. This is why this element surrounds all parts of the framework which belong to the IT/IS department.

After the first version of our SITISM reference framework was completed, we discussed it with experts from science and practice to collect ideas for further applications of the framework which build on its ability to structure the SITISM domain. Some of these ideas and suggestions led us to the design of the further evaluation process that is described in the following section.

4 EVALUATION APPROACH TO THE FRAMEWORK

With this framework at hand, the next stage of our research project was the further evaluation and refinement of the reference framework by applying it in three different SITISM contexts. By doing so,

we differentiate our approach to structure SITISM and go beyond earlier scientific works. According to the research methodology outlined previously (see section 2), we used the findings of these relevance cycles to further refine and improve the framework in three subsequent evaluation/design cycles as displayed in table 1. The following sections outline these three cycles in further detail.

<i>Evaluation Cycle</i>	Cycle 1	Cycle 2	Cycle 3
<i>Methodological Approach</i>	Literature Research, Guided Interviews	Field Study	Action Research
<i>SITISM Domain</i>	SITISM Performance Measurement	SITISM Benchmarking	SITISM Assessment
<i>Dimensions of Evaluation</i>	<ul style="list-style-type: none"> • Acceptance by subject matter experts • Completeness • Operationalizability • Applicability to SITISM performance measurement 	<ul style="list-style-type: none"> • Acceptance by medium-level management • Comprehensibility • Applicability to Benchmarking • Applicability to SITISM 	<ul style="list-style-type: none"> • Acceptance by senior management • Completeness • Applicability to SITISM Assessments and in-depth analysis

Table 1: Evaluation Phases

4.1 Performance Measurement: Development of a Performance Measurement Instrument

In the first cycle, we operationalized the reference framework by developing a performance measurement instrument according to the structure of the framework. We started with such an instrument construction, since a discussion of an abstract reference framework is difficult, especially with senior management, and a framework can only prove its usefulness when it can really facilitate and accelerate management tasks like planning, controlling, and coordination.

A performance measurement instrument for SITISM has to consist of a set of key performance indicators and additional measures suitable for describing and comparing IT organizations. The structure of the measurement instrument was directly derived from the reference framework. We developed a questionnaire for each of the framework's elements to capture the state of the respective decision field. The elements *Strategic IT/IS Directions & Governance* as well as *Financials & Steering* are represented by a single integrated questionnaire so that the overall instrument comprises seven questionnaires.

The questionnaires' contents are based on the idea that executive managers will better accept an instrument if it is based on well-known and already accepted measures. Consequently, our approach was to explore the spectrum of measures and metrics that are commonly used for IT/IS management in practice. We analyzed those measures and derived the required items for a questionnaire by using a four-step approach:

1. In a first step, we used existing knowledge from the literature (e.g. Kütz, 2006a; 2006b) and previous case studies we conducted. We collected IT/IS management measures encountered in those sources and also incorporated our experience from previous research and practice projects.
2. We discussed the list of measures with four different subject-matter experts in the form of guided interviews. These experts were identified using a convenience sample. The objective of the interviews was to check the completeness of the measures, extend, and prioritize them.
3. Afterwards we constructed a first version of the questionnaires by analyzing the computation formulas for the measures, determining the required items, and translating them into questions for the questionnaires.
4. In order to determine the quality of the instrument, we organized a pre-test with four companies, which initiated the necessary data collection and filled out the questionnaires. We then obtained feedback on the quality of the items and the resulting measures.

5. This feedback was the basis of a subsequent improvement and refinement of the questionnaire.

The process of developing the instrument was concluded successfully based on the participants' feedback. The process took us six months and led to questionnaires of approximately 40 pages in total.

4.2 Benchmarking: Applying the Performance Measurement Instrument to IT Organizations

After we had concluded the development of the questionnaires, we wanted to determine whether the reference framework and the corresponding performance measurement instrument could be applied efficiently and effectively. We decided to use the questionnaires we had designed based on our suggested framework in a field study. In this context, we mailed the questionnaires to companies that were participating in an IT benchmarking initiative that we were conducting in cooperation with a consulting company. The questionnaires were addressed to IT departments within companies or group enterprises. The participants are medium to large German and Austrian companies, covering various industries. Their turnover ranges from approximately EUR 15 million to EUR 3.4 billion and they employ between 200 and 15,000 FTEs. The typical participant is present in 5, mainly European countries. Around 75% of the participating IT entities are departments within a legal entity; the others are separate legal entities, but still belong to a group enterprise and serve the group exclusively.

Out of the 107 companies that are member companies of the benchmarking initiative, a total of 35 companies participated in our survey, 7 of these participated in the survey in both years that we conducted it. As the questionnaires are very comprehensive, we decided to allow the participants to select the SITISM domains for which they wanted to provide data. Only questionnaire A was mandatory since it contains the basic indicators of the financial and quantitative information required to characterize the IT entity.

The questionnaires were sent in two consecutive years, 2006 and 2007, covering the participants' information for the preceding fiscal year. This longitudinal and cross-sectional study provided us with a dataset of 129 individual questionnaires. The distribution of the answers is shown in table 2.

<i>Year</i> \ <i>Questionnaire</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>
2006	21	11	7	2	10	9	3
2007	21	14	8	5	7	8	3
Total	42	25	15	7	17	17	6

Table 2 *Distribution of responses*

The purpose of this part of our research was to populate the various questionnaires with data from peer companies to determine whether IT managers are able to work with the framework and the measurement instrument. Moreover, the data collected was intended for subsequent use in an assessment context (see section 3.3). Based on the responses, we calculated a set of statistical measures to characterize the mean, distribution, and dispersion of data and stored the results in a database.

We conducted two workshops with the participants during which we presented the results. Furthermore, we collected feedback on the framework and the questionnaires. The participating IT managers regarded both as adequately reflecting the overall fields of decision-making as well as the respective structures within them. While this initial data set is limited in size, we realize that the chosen approach provides us with valuable insights that could lead to an improvement of our framework and methodology. This iterative evaluation process is essential to design science (Hevner, 2007; Hevner et al., 2004).

4.3 SITISM Assessment: Analyzing the Efficiency and Effectiveness of IT Organizations

With the questionnaire and a populated database at hand, we conducted a pilot study to determine whether our SITISM reference framework can actually be used for a comparative assessment of IT/IS

strategy. For the purpose of this study, we partnered with a real-estate service company's IT department. The company currently serves a large group enterprise and has started to serve external customers, i.e. non-group companies, as well. With an annual turnover of about EUR 950 million and with about 7,000 FTE employees, the company is one of the largest real-estate managers in Europe. The company's IT department currently administers a budget of around EUR 44.2 million and has 33 FTEs. The department is characterized by a high sourcing ratio: 92% of products and services in terms of the department's total annual budget are sourced from external providers. The presence of a specialized IT provider in the group enterprise creates a particular situation. About 25% of the total volume of products and services outsourced is delivered by this IT provider. A few years ago, this ratio was even higher, but the IT department has implemented a multi-vendor strategy since.

The pilot study was initiated in Jul. 2007 and concluded at the beginning of Nov. 2007. In the first weeks, the project team of the IT department was briefed on the usage of the questionnaire. All terms used were explained and the explanations provided were codified in an appendix to the questionnaire.

Together with the partner company we jointly developed a multi-stage approach to completing the questionnaires. After the briefing of the project team, the questionnaires were mailed to subject-matter experts. For example, questionnaire "C" covering applications and the application portfolio was sent to the responsible application manager. The experts completed the questionnaires individually, after which the project leader of the company consolidated the responses. This consolidated set of questionnaires was assessed in terms of the internal consistency of the data and mailed back to the project team. The identified consistency problems were resolved in moderated conference calls with the experts involved. Afterwards, the complete set of questionnaires was sent to all the experts individually. Feedback provided during this phase formed the basis for an on-site workshop with the project team and one of the authors. After clarifying contradictory data and assessing the data quality, the revised questionnaires were signed-off during a workshop with all of the experts involved. One of the authors supported the entire process. Problems encountered, clarifications, and other issues were documented. Parallel to the completion of the questionnaires, the project team as a whole, as well as all the experts individually were asked to comment extensively on the data. This did not only help to identify problems, but also made data sources, calculation schemes, and definitions more transparent.

Besides the information from the questionnaires, the workshops, and conversations, the company's project team provided documents that helped us to gain further insights. The documents comprised strategy definition, organizational structure, project descriptions, accounting schema, etc.

During the project, we documented all this information. While the data provided in the questionnaires was analyzed by means of the database described in section 3.2, the comments, documents, and conversations were analyzed systematically by means of qualitative data analysis methods following Schmidt (1997). This resulted in a series of quantitative questionnaires with data that was either scaled metrically or nominally, and an extensive set of qualitative data (documents, conversations, comments) that was either applicable to one particular question or provided general context.

After gathering and analyzing the data, we used the information provided to develop a complete picture of the IT department's situation. Contextual information also included the company as a whole, as well as the group. Data from the questionnaires was interpreted by means of a comparison with the data gathered in our longitudinal study. General performance metrics were derived from this first step. The assessment of the data in light of the departmental and corporate strategy was done in a second step: we carefully analyzed each of the seven domains of the proposed reference framework for SIT-ISM. In each of the domains, various indicators collected in the questionnaires showed noticeable deviations from the distribution of responses that we had collected in our database. These deviations were then compared to the data in the database in more detail and interpreted by means of the qualitative data that we had gathered. The data was made meaningful through the association of qualitative aspects that we extracted from the additional materials.

The results of the data analysis were compiled into a set of documents. These documents were then presented to the company's project team during a workshop. The purpose of this workshop was to (1)

introduce the project partner to our analysis and findings and (2) to gain feedback on the accuracy of our analysis as well as the correctness of the conclusion and diagnosis of the organization. Furthermore, we also gathered feedback on the project team's general perception of the assessment project in terms of methods, instruments, and approach.

5 EVALUATION OF ASSESSMENT-CAPABILITIES

During the final workshop, the company's project team expressed its approval of our approach to assess the department's IT/IS strategy. This explicitly contained the following aspects: (1) the usability of our SITISM reference framework in structuring and analyzing the department's decision domains, (2) the ability of the organization to provide the data needed, (3) the accuracy of the analysis, and (4) the correctness of the diagnosis built thereon. This result confirms our approach.

While a generalization of our findings is not yet possible on this basis, there are some lessons learnt from our empirical work. Of these, the fact that all the participating companies and people fully understood the framework within a few minutes is perhaps the most interesting. Not only the elements of the framework, but also the relationships and the depicted interfaces were intuitively accessible. This is true for both senior IT/IS management and line-function personnel.

In our empirical studies we also observed the qualities of our approach from a researcher's perspective. We could identify four major domains in which the framework helped us communicate in the complex domain of SITISM:

1. *data collection*: structuring the domain of IT/IS management and operations made it easy for our participants to locate the data needed, both in the benchmarking and the assessment study. This refers to an organization's ability to identify the data or information needed, and to capturing them according to the scheme suggested by the framework. Hence, the framework helped us to generate data and to have that data in a format that is comparable across entities.
2. *presenting analysis results*: during the final workshop of the assessment study, we found that the structure of the framework enabled us to easily communicate the results of our analysis. This observation is also true in the context of the workshops that we had with the participants of the benchmarking study at the end of each round. Approximately 20 of the 35 companies that participated attended these workshops and the framework was fully accepted by this audience, too.
3. *structuring the discourse with subject-matter experts*: we find that our approach is able to support discussion with subject-matter experts. Beyond this, the framework enabled the members of the assessed organization to discuss issues with one another. The advantage of this was witnessed during the consolidation workshops within the company: indicators that should have had the same value were measured differently by different experts. Through the usage of our structured approach, the organization was able to uncover these different interpretations and resolve the misunderstandings.
4. *the development of a strategic action plan*: the structure of the data and analysis allowed us to develop a strategic action plan for the assessed company. Whilst the final workshop suggested that the diagnosis and approach are suitable, the framework also allowed us to determine the interdependencies of various initiatives. This factor is particularly important since it illustrates that the framework can also be used to connect to a company's normal strategic planning.

6 CONCLUSIONS AND FURTHER RESEARCH

In this paper we proposed a reference framework for SITISM. We used existing literature from this field and empirical work as a basis for an initial design. This design was refined by means of three iterative evaluation and design cycles. The evaluation of our framework showed that it is considered to be valuable for the organizations that participated in the projects and that the requirements defined in section 3 are met by the framework.

Although the evaluation suggests that the approach we have chosen has potential to not only assess the strategic fit between the observable behavior and operations of an IS/IT department, but also between its aims and goals as explicated in its strategy, we recognize that substantial work remains to be done. With the work presented in this paper being work in progress, the results we present are limited in two ways. Firstly, the empirical work on which we base our analysis is not broad enough yet. Particularly cycle 3 of our evaluation approach, the in-depth assessment, is just a single case so far. Secondly, we recognize that the domain of SITISM contains complex technical, decisional and social processes that are often elusive and unpredictable, also in the presence of reassuring reference models. However, we hope that our approach to structure this domain will contribute to better research and understand the phenomena of this domain.

A first field that we want to address in the near future is the refinement of the questionnaires. As explained in section 4.1, the questionnaires were developed to measure KPIs that are relevant to practitioners and that are actually used to steer IT/IS departments. While we consider this approach valuable to support the relevance of our proposed assessment, we will increase the instrument's scientific foundations. To do so, we are currently refining the constructs at which the KPIs are aiming. Again, we work with subject-matter experts to ensure that we are minimizing any potential loss of relevance.

A further step that we are currently planning is the repetition of the IT assessment-based evaluation with the same company in 2008. This repeated evaluation consists of two aspects: (1) we want to further refine our instruments and methods by evaluating the changes that we made this year and (2) we want to determine whether the diagnosis of the organization in the 2007 assessment and the suggested actions based on this were correct and proved to be valuable for the organization. While the evaluation of the improvement of some aspects might be difficult, the questionnaires along with the additional information that we have gathered will allow us to gain insight into the evaluation of the partner organization itself. The repetition of the SITISM assessment will also be replicated by using the same framework to assess different companies.

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