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IT Strategy Divide:
Professional Practice
and Academic Debate

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The IT Strategy Divide: Professional Practice and Academic Debate

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Abstract
Information Technology (IT) strategy is a top-priority issue in practice. However, despite its practical relevance, research on IT strategy has been limited so far. With respect to the definition of an IT strategy and its scope, there are a number of ad hoc recommendations and a few conceptual models with little scientific backing. In particular, latest research indicates a gap between the academic discussion on IT strategy and how IT strategy is perceived in practice. Taking this as a motivation, our research sets out to uncover in more detail the concerns and the notions of IT strategy prevalent in practice.

This paper reports on the results of a qualitative research project which included interviews with IT strategy professionals from twelve mid-size to large companies in German speaking countries. It compares the experts' IT strategy practice with the concerns and perceptions that dominate research and the academic discussion.

Our study uncovers striking differences between the academic debate on IT strategy and the concerns IT strategy professional look upon as being important. First of all, we found that professionals are concerned with IT strategy on two different levels, the corporate level and the business unit level strategy. Academics, in contrast, look at IT strategy mostly from a business unit and departmental level. Irrespective of the differences in the level of IT strategy, the strategy concerns focused on in academia differ substantially from those that our professionals were most interested in. The focus of the academic discussion is on IT-based competitive advantages and stresses the role of information as strategic resources, while practitioners are most concerned with decisions on IT infrastructure, IT architecture and standards.

The paper at hand does not only analyse the differences but also takes a closer look at the reasoning of academics and professionals for looking upon certain IT issues as "strategic". Both, the IT strategy concerns raised by our professionals and the rationales used provide valuable input for future research and theory development.

Keywords

IT strategy, IT strategy concerns, IT strategy content, strategic IT decisions, strategic information systems planning (SISP), IT strategy practice

1   Introduction

Information Technology (IT) strategy1) is a top-priority topic in practice. As such, strategic planning of IT is among the highest-ranking issues on management agendas (Galliers et. al., 1994; Watson et al., 1997; McGee et al., 2005; Luftman et al., 2006; Luftman et al., 2009). Another indication is given by editorial columns in practitioner magazines and by practitioner conferences dedicated to the topic of IT strategy (examples are the column "IT Strategien" in Computerwoche, a weekly German IT magazine, and the annual practitioner conference "Strategisches IT-Management" hosted by Handelsblatt, a German daily business newspaper). Finally, it is not unusual to find managers holding positions such as "head of IT strategy" in practice, which underlines that this topic deserves management attention and requires additional resources.

In contrast to the prominence IT strategy enjoys in practice, research findings on the topic are limited and far from clear, as is indicated by an ambiguous use of terms in the field. One finds such various terms as "strategic information plan" (Lederer and Salmela, 1996), "information strategy" (Smits et al., 1997); "IS strategy" (Galliers, 1991), "IS/IT strategy" (Henderson and Venkatraman, 1993), and "IT strategy" (Gottschalk, 1999). This confusion is transferred to the content of IT strategy. It is still unclear which kind of IT-related concerns are included as contents of IT strategy (Teubner and Mocker 2009). Accordingly, Allen and Wilson (1996, p. 240) see the "proliferation of terminology and a great deal of ambiguity surrounding its use" as "one of the fundamental issues facing those wishing to develop an IT strategy".

A major reason for a lack of consensus on the concept of IT strategy is that academic research so far has focused on the process of strategy formation rather than on the outcome, the resulting IT strategy and its contents (Markides, 1999, p. 6). For example, Brown (2004) found that only 26% of articles are concerned with the content while 84% address the process of formation (multiple attribution possible). Teo and Ang (2000) confirm that "most research seems to focus on the IS planning process itself […] rather than on the output […]", i.e. the "strategic IT plan" or simply the "IT strategy".

It is perhaps because of too little research effort that the concept of IT strategy is still ambiguous in the academic debate. Lacking a better concept, Galliers (1991) defines "IT strategy in a broad sense to incorporate the range of issues associated with strategy formation and implementation with respect to information systems". Such a vague definition has resulted in setting up enumerative lists of topics to be included covering heterogeneous issues ranging from hardware and facilities plans to financial plans as well as to investment evaluation methodologies and mission statements (e.g. Conrath et al., 1992; Das et al., 1991; Lederer and Salmela, 1996).

Other authors propose structured models to delineate the content of IT strategies. It is striking that the proposals by Earl (Earl, 1989; Earl, 1996; Earl, 2000), which have perhaps been the most widely received in academic circles (see Brady et al., 1992; Flynn

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1)   In academia the terms "Information Systems (IS) Strategy" or "Information Strategy" are more prominent. As we set out to investigate practice, we prefer to use the term IT strategy which is more popular in practice. However, this is only a matter of terminology and does not indicate a narrow focus of on technology issues.

and Hepburn, 1994; Galliers, 1993 and 2004), are normative rather than based on empirical findings (Allen and Wilson 1996). This is not denied by the author who admits that many parts of his proposal are still "conjectural" (Earl, 1996, p. 491). Confirming this, research by Brady et al. (1992, p. 187) "reveals that delineating between the three [domains of the Earl model] is infrequently done by organizations".

The fact that research on IT strategy has not shown much coherence and convergence so far is exacerbated by the apparent disconnect from practice. The topics discussed under the label "IT strategy" at practitioner conferences and in trade journals have little in common with the focus of established IT strategy research. An analysis of articles published in the 2009 and 2010 volumes of two IT management magazines, the German Computerwoche and the American CIO Magazine, revealed that IT strategy is associated with several issues that deserve senior level management attention. More than two thirds of these issues are either technology developments (e.g. cloud computing, service oriented architecture, software as a service, Web 2.0) or new types of applications (customer relationship management, social software, business intelligence). Concerns in sourcing and governing the IT function make up another 10 per cent. The remaining issues relate to technology standards, IT process standards, IT security issues and other matters.

Furthermore, case study research confirms differences in the contents of IT strategies "within and between organizations, but particularly in comparison to the academic literature" (Brady et al., 1992, p. 183; also see Teubner 2007). In light of this evidence, we think that the gap between IT strategy research and practice is well worth investigating in more detail. On which issues exactly do research and practice disagree? Which topics occur regularly on practitioners' IT strategy agendas but go unnoticed in the academic debate? Where is the opposite true? Are there good reasons for these mutual omissions?

Though past research has indicated that academia and practice are not well connected, it has failed to elaborate on the gap in greater detail. Taking this as a motivation, our research seeks to provide a new and thorough account of the gap between academic debate and IT strategy thinking in practice. It is not our intention to debunk academic research, but we expect that a deeper understanding of practitioners' IT strategy concepts and concerns will further academic discussion at least in three ways: Firstly, it will, we hope, contribute to develop empirically more valid constructs and theories. Thereby, secondly, it will help bridge the gap between academic literature and practice. And, thirdly, research on the practice of IT strategy can potentially provide a fresh impetus for research to address IT strategy issues that have not been studied yet.

Investigating the gap requires not only a sound knowledge of IT strategy research, but also an in-depth understanding of IT strategy thinking in practice – something that we believe is still missing in research. Accordingly, the main aim of our research is to contribute to establishing a more thorough and comprehensive understanding of IT strategy in academia. We have decomposed this aim into three subordinate research questions:

- *Comprehension*: How is the term IT strategy used in practice? What are prevailing notions of and perspectives on IT strategy?

- *Concerns*: What are typical concerns included in practitioners' IT strategies and why? Which decisions are made and what is the content of IT strategy that results from these?

- *Patterns*: Are there common patterns of IT strategy content among companies? Are there striking differences? And if so, what are possible reasons for these differences? The issue of patterns will be the focus of this article.

Answering these three questions should eventually enable us to compare the IT strategy notions and the contents of IT strategies prevailing in practice with those of academic research. This ultimately allows us to analyse any gaps occurring, which is the second major aim of our research.

Broadly, we proceed as follows: Section 2 outlines our research approach in more detail. In Section 3, we give an account of the interview results by way of a comparative analysis. In Section 4, we discuss the findings reported in the previous sections vis-a-vis the academic debate. Here we finally contrast our findings of what we empirically found to be the content of IT strategy with what academia considers or recommends it to be. We try to make sense of the overlap as well as the differences. In the final Section 5, we conclude by highlighting the impact of our study on IT strategy research. We also make suggestions for future research required to further the study of IT strategy in practice and eventually improve IT strategy research.

2   Research approach and methodology

As we have outlined in the previous section, research on IT strategy suffers from a level of ambiguity in terminology and concepts as well as from a missing consensus on the contents of IT strategy. This situation does not lend itself to any "positivistic" or "confirmatory" empirical research as has already been acknowledged by other researchers in the field. For example, Brown (2004, p. 27) argues that "given the lack of theory in strategic information systems planning, it may be appropriate for more theory-generating research to be conducted, employing qualitative techniques […]."

In the case of our research, terminological and conceptual problems with positivistic research are additionally exacerbated by the presumed disconnect between academic research and practice. Rather than working with existing concepts from literature that we consider problematic, it might turn out that we must strive for new concepts that are well grounded in practice. Accordingly, we have chosen a qualitative research approach which is strictly theory-independent, explorative, and bottom-up.

2.1   Data sources and data collection methods

For data collection, we conducted semi-structured interviews, i.e. interviews loosely following a guideline yet allowing ample room for participants to freely express their opinions and ideas. We also arranged for open-ended interview time slots in order to rule out time constraints. We consider such conditions much more feasible for generating the deep and differentiated insight we seek. Participants can reveal their understanding, use, and reasoning of IT strategy in a face to face situation much better than in standardised questionnaires. Also, a standardised approach might induce practitioners to provide textbook answers in order to be compliant with what they think it is we are looking for.

As interview partners we have chosen IT strategy professionals. We initially considered IT management consultants as potential interviewees. But consultants might not fairly represent IT strategy thinking in practice because their job is somewhat removed from immediate practice (as academic work is also often said to be). However, if consulting has significant influence on managers' thinking in regard to IT strategy, this influence should be reflected in what managers say and do. This led us to consider senior executives who are involved in IT strategy-making as interviewees. But talking to executives in general might lead to insufficient or 'thin' data, since they might not spend enough time and thinking on IT strategy. As a consequence, we tried to combine the best of both worlds in our decision to select what we call "IT strategy professionals".

We call a person an "IT strategy professional" if the following conditions apply: firstly, formulating IT strategy within the organisation is a main part of their job description. Such people typically hold formal titles such as "Head of IT strategy". Secondly, they propagate IT strategy by either presenting their organisation's view on IT strategy to other practitioners at conferences, by publishing in practitioner magazines, or by taking part in launching industry-wide IT initiatives.

Our choice of interviewees certainly imposes limits on our study with the universe of IT strategy professionals being much smaller than that of CIO's or IT managers in general. But our choice of subjects has significant advantages. Professionally, our interviewees

can be expected to deal with IT strategy not only incidentally, but as one of their core tasks. Through their regular attendance of strategy conferences and publishing efforts, they have to continually devote a good deal of time and effort to developing, presenting, comparing, and discussing matters of IT strategy. As the experts go "on the record" with their IT strategies, these strategies can be expected to be serious products beyond the state of wishful thinking or idle speculation. Moreover, by presenting the strategy to business circles, these "ambassadors" are also likely to shape the understanding of other practitioners beyond the borders of their own organisation.

As Table 1 shows, we have selected professionals from companies acting in environments of high information intensity of both products and value chain activities because we can expect IT and also IT strategy to play a major role in such organisations (Porter and Millar, 1985). All companies have their headquarters in a German speaking country. Four companies are active only in their respective country; the others are engaged in Europe and globally. Apart from the geographic limitations and the intentional bias towards information intensive industries, we tried to balance our sample by including organisations from both the public and the private sector as well as from different industries.

No.	Industry	Empl.	Rev.♣⁾	Organisation including IT
1	Insurance	2,800	2 bn.	functional organization, CIO represents IT and organisation on the board; IT is a main department with three sub-departments including "IT Infrastructure"
2	Insurance	3,500	1 bn.	two regional headquarters, 500 sales offices, 1,500 partner institutions across the north-western part of Germany; IT organized in four separate departments reporting to board member
3	Health care	60,000	4 bn.	globally operating corporation, 3 business units; IT organized as corporate function
4	Public institution	1,400	NPO	functionally divided public institution, >10 functional departments, operating mainly in Europe; IT organized as functional department
5	Telecommunication	240,000	50 bn.	globally operating corporation, 3 business units including one for IT services; IT corporate staff unit
6	Investment Bank	700	24 bn.	small but globally operating private bank, legally independent subsidiary of a large corporation; IT organized as a functional department
7	Logistics	400,000	17 bn.	globally operating corporation with several subsidiaries; 5 business units, one of them including an IT Service Provider, IT is corporate staff unit in business unit s
8	Universal bank	20,000	320 bn.	globally operating company; 8 business units; IT organized as corporate staff unit + IT departments in every business unit
9	Public Transportation	250,000	30 bn.	globally operating corporation with >5 subsidiaries; 5 business units; IT organized as corporate staff unit + IT service provider as a subsidiary
10	Direct bank	25	48 mn.	functionally divided company; IT organized as functional department
11	Air Transportation	90,000	23 bn.	globally operating corporation, 3 subsidiaries; >5 business units; IT corporate staff unit + IT service provider as one business unit + IT departments in every business unit
12	Ceramics manufacturer	10,000	1 bn.	globally operating company; 3 business units; IT is organized as corporate function

Table 1: Organisational characteristics of the research sample

In total, we have conducted interviews with twelve IT strategy professionals, all persons male. Each interview took about two hours. All interviews except one phone interview were conducted at the respective company's site. Table 2 summarises the research

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♣⁾ Premium income for insurance, assets under management for investment banks, credit volume for banks. 2004 figures.

sample according to these characteristics. Additionally, we conducted two more interviews that are not included in this research, as they do not meet the quality standards defined above. The first was conducted with a slightly different interview guideline, the second could not be voice recorded due to the interviewee's refusal and hence did not allow for proper coding and analysis.

No.	Title of expert	Position within IT organisation
1	Director IT Strategy	Staff position to the head of department for "IT Infrastructure"
2	Director IT Development	Head of one department reporting to Board
3	CIO	Head of IT profit centre, represents IT on the corporate level
4	Director Information Systems	Head of IT department reporting to board member
5	VP Corporate-IT-Management	Deputy head of corporate IT staff unit
6	Director IT Department	Head of IT department reporting to board member
7	Global Head of IT Logistics	Head of one department reporting to SBU board member
8	Deputy Head of Corporate IT Strategy	Deputy head of corporate IT staff unit
9	Head of IT Corporate strategy	Head of corporate IT staff unit
10	Head of IT strategy	Head of IT department (fully outsourced)
11	Head of Corporate IT strategy	Head of corporate IT staff unit
12	CIO, Director of IT Department	Head of IT department reporting to Board member (CFO)

Table 2: Interviewees

The interviews were conducted in German as this was the native language of our interviewees. Our loose interview guideline gave the interviewees room for expressing themselves freely. This format allowed us to concentrate effectively on those aspects of IT strategy that the interviewees viewed as central. In fact, the interviews were more a discussion than merely questions followed by answers (for details on the interview guideline see Appendix A.1.1).

2.2   Data analysis

Our analysis also followed the spirit of a qualitative and explorative research approach that is subjective and interpretive in nature. We did not look for objective truth but sought to understand social reality as a construction of the people interacting in it, while taking the specific situational context into account (Orlikowski and Baroudi, 1991, pp 4.). Generally speaking, in analysing the statements of our interviewees, we tried to obtain deeper, more general insights not based on numbers, i.e. statistical significance, but based on persuasiveness and conclusiveness of the interviewees' arguments. This posed the challenge to make sense of what the interviewees said in light of what they told us about their organisation, their role in it, and the way they perceived IT strategy. Hence, our analysis was guided by the statements of the interviewees without disregarding any of what they said based on what is 'textbook proper'. By this we tried to canvass an unalloyed, raw,

and unbiased perception of what IT strategy in practice means and includes (for details on the methodology see Appendix A.1.2).

In particular, our analysis consisted of two phases. The first phase was concerned with the isolated analysis of the individual interviews. We call this phase the intra-case analysis (for detailed information on our intra-case analysis see Appendices Intra-case analysis methodology and analysis).

In the second phase we analysed all our cases collectively to identify common IT strategy concerns among our professionals. We call this phase the inter-case analysis. The purpose of this phase was the development of overarching categories of similar IT strategy content that helped to meaningfully compare the perceptions of the professionals first with each other and, after that, with the concerns prevailing in academic discussion. Hence, to facilitate comparison, the challenge of this stage lay in integrating the IT strategy concerns of different interviewees into common categories neither too general nor particular, but on a level with academic concepts. We applied a cyclic methodology to meet this challenge, which is also outlined in the Methodology Appendix A.1. The inter-case analysis is presented in Section 3.

Having analysed the interviews, we finally compared academic and practical understandings of IT strategy. The outcomes of that are provided in Section 4. There, we start by outlining to the reader a rough overview of the current state of IT strategy research and the corresponding academic discussion. This overview is based on an extensive literature review. The methodology we applied for this review is documented in Appendix A.1.4. An overview of the results is given Appendix A.2.3. We finally reflect on our findings from the interviews in the light of the portrayed academic discussion.

3 Findings

While our case-wise analysis delivered good insight into what our IT strategy profession-als focused on strategically, it bore several problems for a rigorous analysis. First, each case had – to a lesser or greater extent – its own concerns supported by its own reason-ing. Indeed, a quick once-over of our interviews revealed that there was no one dominant understanding of IT strategy shared by all practitioner experts. Moreover, the identifica-tion of common concerns about IT strategy is further compounded by an inconsistent language use that makes a direct comparison of the intra-case results all but impossible. Therefore, and in order to maintain a palatable length, we confine the display of our find-ings to the inter-case analysis of the interviews, which has generated more general re-sults. We refer the reader interested in the details of the intra-case findings to the indi-vidual case presentations of our interviews in Appendix A.2.1.

This inter-case analysis looks for common categories of similar IT strategy concerns across the cases, thus making them more comparable. In the following, we present the common concerns identified and the reasons given for classifying them as strategic (Sec-tion 3.2). We start with a short introduction to practitioners' IT strategy thinking (Section 3.1).

3.1 Practitioners' approaches to IT strategy

Independent of the particular IT strategy concerns we have identified, it was striking to see how our experts conceptualised their strategic approach towards IT. We can broadly distinguish two different approaches. When asked about their IT strategy concerns, one group of our interviewees immediately thought in terms of different IT objects for which they had to make strategic decisions. This group identified strategic concerns with re-spect to different objects, for example IT infrastructure or application systems, and built up their IT strategies based on decisions on these objects. Accordingly, most of the stra-tegic IT decisions directly or indirectly related to these objects. Another group of inter-viewees followed certain dominant themes that, for them, had "strategic relevance". These themes typically had an impact on a number of decisions in different domains. For example, experts who looked upon IT standardisation as a strategic theme saw the pur-suit of standardisation across different domains (e.g. technical infrastructure, application landscape) as their primary strategic task. In fact, several of our interviewees, when asked about their IT strategy, immediately raised the question of standardisation of IT in-frastructure, architecture, processes, or rules as their primary concern. Standardisation was a driving theme in 8 of our 12 cases (cases 2, 4, 5, 7, 8, 9, 11, and 12). Some ex-amples for decisions driven by standardisation concerns are: the decision to reduce the number of parallel DBMS in use from seven to two company-wide (case 5); unification on one core DBMS and one core OS company-wide (case 4); using a "high-end" and "low-end" software development architecture company-wide (case 9); and using Linux as OS and SAP as ERP company-wide (case 12); Process-related standardisation contains de-cisions such as standardizing IT-related processes by introducing ITIL company-wide (case 9); unifying process standards and standardizing IT operations and process man-agement company-wide (case 11); standardising IT management processes company-wide (case 7); and rendering IT processes and control structures SOX 404 compliant company-wide (case 6).

The two different approaches to conceptualising IT strategy are not mutually exclusive. On the contrary, a strategy maker being driven by a dominant theme will make decisions that will overlap with those decisions focused by a strategy maker who approaches the field in terms of objects. For example, standardisation as a driving theme might lead to decisions on standardising the IT infrastructure, while a focus on IT infrastructure as the core content of IT strategy might also include decisions on standardisation. Moreover, none of our interview partners exclusively thought in terms of decision objects or running themes. Rather, those interviewees who approached IT strategy formulation from the object point of view tended to be less preoccupied with a certain theme and vice versa.

3.2 IT strategy concerns and considerations

Table 3 gives an overview of the common concerns in IT strategy across the cases. These concerns are coded according to eight all-encompassing categories that have been developed during the inter-case analysis (see Section 2 and Methodology Appendix A.1.3). In the following, we briefly introduce each of the eight categories that we were able to identify in turn by presenting a categorised summary of our professionals' major practical concerns supported by quotes from our interviews. We also provide the rationales for considering these concerns strategic. Table 3 gives a summary of the categories. The concerns are ordered by decreasing relevance. The relevance is determined by both the presence of the concerns throughout the interviews and their relative importance in the respective IT strategies (see column "Cases" in Table 3 and the table key).

	Definition	Cases♦			Why strategic? – Interview quote
IT architecture	Definition of rules to follow when designing the Information Infrastructure (IT applications, IT infrastructure) in support of business processes. Such rules may include the definition of design patterns as well as the stipulation of standards.	1, 2 4, 5 6, 7 8, 9 11, 12	-	3 10	"Architectures are absolutely strategic. They determine whether you can deliver or not. We always say that there are three dimensions: efficiency, effectiveness and sustainability. Sustainability is often not mentioned as the third dimension. Yet it is sustainability that ensures that efficiency and effectiveness are not exclusively short term phenomena but can be achieved over a prolonged period. Architectures ensure this kind of sustainability." (case 4)
IT organisation	Decisions on specialisation, hierarchical configuration and coordination of IT-related task fulfilment. Includes also IT governance issues, i.e. the allocation of rights and accountabilities for IT-related decisions.	2, 3 5, 6 8, 9 11 12	4 7	1 10	"For me, IT strategy is always linked to governance. For IT governance determines who is allowed to do what, how budgets are set, how investments are made. What can the CIO decide, what the business, what the local units? Who else do we have to ask? Thus it ultimately regulates the execution of the IT strategy. So you first tie up the responsibilities and the processes. And once that's done, the people responsible can start working on the processes defined." (case 8)
IT infrastructure	Decisions regarding the choice and integration of hardware and systems software components such as personal computers, data and communication network, middleware, operating systems, and database management systems.	1 2 3 6 7 12	4 8 10 11	5 9	"Fundamentally, there are two issues that one deals with or should deal with [strategically] regarding IT. That is a) [IT governance] and b) what is the right application landscape; how do we want to develop it, control it and what is the proper IT infrastructure, the platform it builds up on. And all of this with regard to the ultimate goal of being economically sustainable. Therefore, [IT infrastructure is so important] because we don't act for the moment but know that the life expectancy of all our [software] systems is more than 10 years, some even 20, even of those that are built today. And even for the hardware we know that it is used at least 4 years, often closer to 7 or 8 years. And as long as hardware has an impact on applications and architectural principles, the long term repercussions on our sustainability are even stronger." (case 2)
Application systems	Decisions on the reach and range of application systems in support of the business: which business functions (reach) are to be supported by which applications and functional features (range).	2 3 6 7 8 11 12	4	1 5 9 10	"So in our IT infrastructure strategy we define things such as the importance of Linux as an OS for us, how we want to equip the client, what is our office software strategy and so forth. This is business unit independent and set as a mandatory standard. The business units start joining in when it comes to business applications. What applications do we need: do we need a retail system, do we need a business warehouse solution, an e-shop and so on. We collect these requests and harmonize them via our central project roadmap. We mostly accommodate the requests, but sometimes we might also decide to just roll out a customized standard solution. By this we try to achieve economies of scale while at the same time answering the specific application needs of the business units." (case 12)

IT security	Decisions on measures to ensure reliable operations, to recover from disaster, and to protect systems and data against fraud and abuse.	4 10 11	2 6 7	1, 3 5, 8 9 12	"[IT security is strategic for us because] if we have a security breach somewhere, we have to close down the whole business." (case 10)
IT human resources	Decisions on manpower requirements and recruitment of IT personnel as well as on the development of IT personnel skills.	4 6 12	2 11	1, 3 5, 7 8, 9	"What can I say? Now if the IT employees with their qualifications were not strategic, then IT would completely lose its strategic relevance for the organization. For me, the employees and their qualifications really are the central issue. The better the qualification of our people, the easier we can turn our strategy around. Right, left – it doesn't matter." (case 6)
IT outsourcing	Decisions on whether an IT tasks is to be executed internally or handed over to external providers. Includes short term make-or-buy decisions as well as decisions on how to govern long-term outsourcing relationships.	4 10 12		1, 2 3, 5 6, 7 8, 9 11	"And for me strategic decisions are things that are stable over several years and provide a guideline for important subsequent decisions to be made in that context. Take, for example, our sourcing strategy. Two years ago, we decided based on a benchmarking that we would continue to operate our data centre in-house by ourselves for the next three years. And so we set a planning fixture for ourselves that we could and continue to orientate by." (case 12)

Table 3: Categories of IT strategy concerns

♦ **"Cases"**
 - **left column**: direct focus, major IT strategy concern
 - **middle column**: implicit or minor IT strategy concern
 - **right column**: no concern at all

3.2.1 IT architecture

IT architecture decisions proved a staple ingredient of many of our IT strategists' agendas. They were made in 10 of the 12 cases. All interview partners conceived of IT architecture in slightly different ways, which did not allow us to immediately identify a consolidated understanding of IT architecture. However, in looking at the cases critically, we define, in accordance with our principles, IT architecture decisions as a set of technical and functional rules that govern the design and interaction of IT application systems, IT infrastructure, and IT-related business processes. Case 2 illustrates the common purpose of architecture decisions. According to the interviewee, this purpose is to allow the coexistence of a broad menu of traditional legacy systems alongside sophisticated leading-edge applications. At the heart of the architecture considerations in this company sits a middleware platform which is supposed to enable the integration of almost any new application into the existing landscape. Because the company's business processes are largely IT-based, it was hoped by this measure to achieve excellent business flexibility ("whatever the business needs, we can integrate it") as well as a high responsiveness to business unit demands in between official planning cycles. It is the middleware layer which exactly demarcates the technical architecture from the applications architecture. The interviewee in case 2 differentiates between a technical "systems architecture" that deals with questions such as Oracle vs. DB2 on the one hand, and decisions on how to build the application systems on the other hand. The latter include decisions on fat vs. thin client or a two vs. three tier architecture. We found a similar distinction in case 4, where "technical architecture", "applications architecture", and "business process architecture" are distinguished.

Across all cases, IT architecture decisions chiefly belonged to the technical end of the continuum rather than the functional one. Such technical questions deal mainly with how many and which basic IT systems are needed (e.g. 2 instead of 7 different DBMS company-wide – case 5; two different CASE tools company-wide – case 7; unifying on one "enterprise platform", one DBMS, and one OS company-wide – case 6; unifying on one OS and one ERP company-wide – case 12 etc.).

Type of concern	Explanation and examples
Application systems standards	Application design patterns (e.g. 3 tier, thin client configuration) and standards (object orientation paradigm) to follow when building applications.
Technical architecture	Ground rules for IT infrastructure configuration (e.g. limitations in component heterogeneity) and standards (e.g. OSI model, TCP/IP communication) to be followed in building the technical infrastructure.
Business process standards	Domain models and procedures that business processes must obey when supported through IT.

Table 4: IT architecture concerns

IT architecture decisions were regarded strategic for several reasons. Firstly, IT architecture decisions "have a medium-term to long-term character, which means that they are stable over a longer period of time and that they are of high relevance and provide a certain reliability" (case 12). The interviewee of case 4 argues to the same effect: "Architectures decide whether or not you can deliver […]; they ensure sustainability." In addition, they are decisions that "bind us for at least the next five years. Consider for example the '2 ½ node concept' [an IT security architecture – authors' note], which is a long-term commitment" (case 4). This long-term nature and foundational characteristic was also stressed in cases 1, 2, 6, and 11. Secondly, IT architec-

tures were considered strategic because they helped ensure "optimal support of the business process" (case 9) and answered the question of "what do I need to do on the IT side to support our business requirements?" (case 5). This also included business continuity aspects such as developing fall-back scenarios in case of a catastrophe (e.g. case 6). Similar arguments were made in cases 1 and 2. Thirdly, the aspect of supporting the business in the best possible way was frequently complemented by the goal to save costs in the process. The interviewee of case 6, for example, explained that for him IT architecture was a strategic concern because it provided "quick and flexible support of the business requirements with only a marginal increase in maintenance and production costs." The same kind of emphasis on sustainability and efficiency considerations was also made in cases 1, 2, 5, and 9.

3.2.2 IT infrastructure

Just like IT architecture, IT infrastructure was also a strategic concern in 10 out of 12 our cases. Yet in contrast to IT architecture, it was explicitly mentioned as such only in 6 of these 10 cases. Whereas undoubtedly an important strategic concern for the remaining 4 practitioners as well, they referred to it only indirectly, and this sometimes even solely implicitly. The prime example is case 8, where decisions on the standardisation of such a broad array of IT infrastructure components as the hardware base, network technology, operating systems, and database management systems across the whole organisation was regarded a major strategic concern – without the interviewee mentioning the term "infrastructure" once during the whole interview.

Whether being addressed directly or indirectly, the notion of IT infrastructure varied from case to case. Nevertheless, we could identify two common patterns: IT infrastructure decisions were either about choices in the basic IT hardware and software components such as personal computers, telephones, network cables, operating systems, and database management systems. If not about this, they were about organisational network features. Both interpretations fit common textbook notions. A typical example for a strategic IT infrastructure decision gives case 2, where it was strategically decided "which platform [to] use for the next 10 years: do we run our Websphere environment on Unix or Windows or under Z/Linux on a host?" A very similar example is provided in case 10, where the question which document management system and groupware tool should be used companywide was a strategic decision. In case 7, a global service provider, it was strategically decided to implement a global intranet connecting all international subsidiaries. The network was also the focus in case 11. Here, the provision of a secure global network to easily integrate acquisitions and separate disinvestments without compromising the sensitive database of the airline was a strategic IT infrastructure decision.

Type of concern	Explanation and examples
Hardware and software product choices	Decisions on the acquisition of specific products from specific providers (e.g. IBM's Websphere).
IT infrastructure configuration	Decisions regarding the features, reach, linking and integration of the technical infrastructure.

Table 5: IT infrastructure concerns

In contrast to IT architecture decisions, IT infrastructure decisions were about a particular product or are considered a statement about a confined element such as the physical network. IT architecture decisions dealt with general rules and principles independent of particular products. The two categories were similar, however, when considering the reasons why these decisions

were called strategic. Often the aim was "simply exploitation of synergies, […] efficiency increases" (case 5) by standardization or unification of IT infrastructure components. By maintaining fewer different operating systems concurrently or unifying features of their network, the organisations in our sample hoped to reduce maintenance costs or the need for experts from various backgrounds. Without facing IT infrastructure challenges strategically, a company would soon become a "very costly technology zoo" (case 8). Another important motive were the "medium- to long-term implications" (case 12) of decisions on an infrastructural component. Thus, IT infrastructure decisions were held to be strategic because they contribute to cost savings or entailed long-term consequences.

3.2.3 IT organisation

The concern of organising the IT function was one of the major strategic concerns of our interview partners. Decisions falling into this category were made in all our cases except 1 and 10. The decisions we subsume here were concerned with the processes and structures required to provide IT services to business. This includes the definition of which IT-related tasks were necessary to support business, which skills and roles were required, and how the roles and tasks could be co-ordinated towards common ends through regulatory structures. Of all strategic decisions on IT organisation, IT governance decisions made up the biggest part. In fact, many experts drew no clear distinction between the two terms and uniformly referred to all their strategic organisational decisions as IT governance decisions. According to this rather unspecific and inclusive way of labelling, the understanding of the concept of IT governance differed widely: only in cases 4, 5, 7, 8, and 9 was the label "IT governance" used to classify decisions in accordance with common textbook definitions. In these cases, IT governance was understood as the allocation of rights and accountabilities for IT-related decisions in the organization. The interviewee of case 8 captured this view perhaps most illustratively. For him, IT governance "determines who is allowed to do what, how budgets are set, how investments are made. What can the CIO decide, what the business, what the local units? Who else do we have to ask? Thus, it ultimately regulates the execution of the IT strategy."

It is noteworthy that a large group of interviewees (also) saw the internal organization of the IT department as a strategic IT governance concern (cases 3, 5, 6, 11, and 12) – thus providing an example for decisions of solely organisational nature referred to as IT governance. Besides defining the responsibilities of the IT function and its organisational structure, IT organisation concerns also included the definition of IT processes (e.g. processes for application design, processes for IT operations) in cases 1, 4, and 9.

A smaller, third strand of IT organisation concerns was evident in cases 3 and 4, where shaping the IT unit's self-perception and profile towards the rest of the organisation was also taken to be a strategic effort.

Type of concern	Explanation and examples
IT governance	Distribution of IT-related decision rights and accountabilities between IT and business within the organisation. Major IT decisions refer to IT needs, investment decisions, and decisions on standards to be obeyed.
Organisational structure	Formal composition and hierarchical structure of the IT function
Process structures	Procedures and rules for executing core IT processes such as application development (e.g. software lifecycle models, project management methodologies) or IT operations management (e.g. ITIL)
Profile of the IT function	Self-perception and external perception of (expectations towards) the IT unit

Table 6: IT organisation concerns

Our interviewees gave two main reasons for IT organisation concerns to be part of an IT strategy. The first reason is related to the mid to long-term perspective of these kinds of decisions. They "tie up for several years" (case 4), have "a mid-term perspective" (case 11), a "long-term character" (case 13) or binding effects "for three to five years" (case 10). Secondly, such decisions were seen as strategic because they were fundamental in setting a common playing field. In case 9, for example, defining an IT rights and accountabilities framework was considered an IT strategy issue because implementing such a framework "is the only chance in a company of this size if you do not want to rule with a weapon in your hands". In a similar manner, setting rights and responsibilities was also regarded part of IT strategy in case 3: "This is a very important aspect: I have an application landscape that I would like to introduce. How am I going to do that? What is my authority framework, what are my constraints?"

3.2.4 Application systems

IT strategy decisions regarding the IT applications were made in cases 2, 3, 4, 6, 7, 8, 11, and 12. In this category, we subsume decisions that refer to the development of the company's application systems in support of a particular business purpose. In cases 8, 11, and 12, these decisions focused on the prioritisation of application needs and investments in future applications. In these cases, separate business units regularly submitted application requests that were evaluated, prioritized and implemented if they met the centrally set requirements concerning, for example, resource limits and strategic fit considerations.

In the other cases, application system concerns took a broader perspective on the future structure of the application landscape and its integration with the current state. Case 2, an insurance company, provides a detailed example for this broader view. In this organisation, business units applied for new applications "at least once a year" and most of the requests were immediately implemented. To retain an element of cohesion and coherence in the application landscape, the IT department was in charge of evaluating, in regular intervals, global IT trends and likely long-term impacts on the present application landscape. This analysis was done from a strategic viewpoint and independent of business unit requests. It provided the basis for mid to long-term application replacement and development strategies. These strategies had to accomplish the feat of matching a strategic, long-term perspective with rather opportunistic and short-termed business demands. The IT infrastructure, conversely, was standardised across the board. The line between the two areas was drawn at the DBMS and OS level. Such elements were unified while the application landscape was broad and varied. We encountered a similar situation in case 3, where the IT application landscape was also a regular object of strategic refurbishments

in order to keep up with changing business needs. Here, too, the distinction to IT infrastructure was made at the level of DBMS and OS.

Type of concern	Explanation and examples
Application investment portfolio	Prioritisation of application needs and decisions on investments in application systems projects.
Future application landscape	Blueprint of the overall to-be application systems landscape including current and future application systems and their integration.

Table 7: Application systems concerns

On the whole, the reasons for considering decisions on application systems as strategic differed. In many cases, this happened because advancing the company's applications was seen as a crucial instrument to translate business needs into practice and allow an optimum of business flexibility (e.g. cases 2, 3, 8, 11, and 12). The interviewee in case 11 put it this way: "What is an IT strategy? That is the application portfolio mainly because it is naturally the closest interface between the business units and the IT departments. And it certainly is the highest expectation of an IT department […] to advance the business development by means of the application portfolio. That is the main question, actually." In other cases, mainly cases 7 and 12, efficiency and synergies were the central concerns. In these cases, the application landscape (by its standardisation) was seen as a strategic contributor to saving costs. Independent of these concerns, the time factor, i.e. the long-term resource tie-ups and usage ramifications, was also called upon as a factor making application landscape decisions strategic (cases 1, 2, 12).

3.2.5 IT security

Strategic decisions concerning IT security were present in cases 2, 4, 6, 7, 10, and 11. IT security in the eyes of our strategy professionals includes all concerns related to ensuring smooth operations of systems and protecting them against abuse. Looking at all cases, three major streams of IT security-related strategic decisions emerged. There were, firstly, decisions concerned with reliability of IT operations (i.e. absence of failure); secondly, decisions concerning catastrophe and breakdown recovery; and, thirdly, decisions about access control and data protection. For the direct bank in case 10, IT security was the second most important concern in IT strategy, second only to IT outsourcing. The importance of IT security for this organisation was indicated by the wide range of measures that the bank took in maintaining the security of their data. They used such diverse means as penetration tests, robot customers, data protection officers, international collaborations with private detectives specialised in data theft, on-site server inspections, failure risk based insurance contracts and certain security-related certificates that outsourcing partners needed to provide. Operational reliability up to disaster recovery was also an important motivator for calling IT risk a strategic concern in cases 2, 4, 6, and 7.

Concerns in IT security were not always stated as concerns of their own but sometimes appeared as a part of other concerns. For example in case 11, the protection of the corporation-wide network was an inherent part of network infrastructure planning. In case 2, the decision to maintain a broad landscape of independent applications also served the goal of operating reliability. In case 6, the decision to use the local asset managers as decentralized data storage united through a central web interface facilitated greater business flexibility, but also worked as a "fall back scenario in our business contingency planning in case of a catastrophe." A similar

logic applied in the "2½ node concept" in case 4, where data repositories that were essential to the company were mirrored in different places around the globe. In the multinational logistics corporation of case 7, where local business units could often make their own decisions for many IT-related operational questions, the decision on how local data centres are to be operated was a strategic concern of the corporate IT unit "in order for such things as disaster recovery to work. We cannot afford to lose too much time if something dramatic really happens. So essentially, issues that do not span multiple business units but are of crucial importance for single ones are also part of our IT strategy."

Type of concern	Explanation and examples
Infrastructure reliability	Decisions on introducing and implementing policies and mechanisms to ensure smooth IT operations and reliable IT services.
Disaster recovery	Decisions on how to act in the case of total breakdown.
Protection against fraud	Decisions on access control and mechanisms for the protection of systems, data and information.

Table 8: IT-security concerns

3.2.6 IT human resources

A minor IT strategy concern consists in IT personnel decisions. Such decisions were explicitly mentioned in cases 4, 6, and 12 and a very minor element in cases 2 and 11. In the latter two, they were acknowledged as "naturally" being a strategic concern but without further explanation and only on being asked. In the former three cases, on the other hand, IT personnel issues, mainly the question of employee development, were a dedicated focus of strategic attention. "The employees and their qualifications are core issues of our IT strategy", as the case 6 interviewee put it. In case 4, the employee qualification developments were moreover coordinated with development programs of other functions in order to avoid unnecessary friction and redundancies. Also in case 4, work contract duration was an issue to be decided strategically because a long term work contract impeded "phasing out the people if the performance turns out to be different from what we have imagined". It is remarkable that the strategic human resource considerations were restricted to personnel of the IT function, whereas the IT abilities of business staff were not a matter of strategic concern at all. Long term policies for educating business personnel in IT-related skills such as personal information management or computer literacy were missing completely.

Type of concern	Explanation and examples
Training and education of IT personnel	Decisions concerning the qualifications of IT personnel and on mutual business/IT understanding.
Hiring policies and contract design	Decisions on hiring policies (e.g. qualification or certificate requirements) and contract design (e.g. contract duration and development opportunities).

Table 9: IT-related human resource concerns

The long-term effects were also the crucial ingredient that made the employee development de-cisions strategic, for if "I develop staff in a particular direction, I cannot turn this direction around just like that. That's a long-term commitment." (case 4, similar case 12). However, the inter-viewee of case 6 also pointed out the flexibility gain that makes the qualification issue strategic for him: "The better the qualifications are, the easier we can adjust, no matter whether it's right or left."

3.2.7 IT outsourcing

IT outsourcing decisions are concerned with the extent to which the IT function – or parts there-of – is performed in-house or supplied by external providers. IT outsourcing played a strategic role in cases 4, 10, and 12, with case 10 being the key example for a case in which IT outsourc-ing decisions were a high strategic priority. Dedicating a paragraph here to IT outsourcing as an IT strategy concern might appear an overkill at first sight: IT outsourcing did not play a strategic role in 9 out of 12 cases; the term was not even used in a few interviews. Nevertheless, we consider the few instances in which IT outsourcing actually was a strategic issue important enough to mention it here explicitly. The prime example is case 10, where by far most strategic thought was dedicated to IT outsourcing. IT Outsourcing in this case was the single overriding issue on our practitioner's IT strategy agenda. Here, all facets of IT outsourcing down to the smallest details were treated with highest management attention and granted strategic im-portance. Taken as a whole, the IT outsourcing issues dealt with strategically in this case could be divided into issues of contract design in specifying potential and impending outsourcing part-nerships and issues related to the ongoing execution of these contracts. The first group includ-ed issues such as definition of interfaces between the bank and the outsourcing vendor, precise and comprehensive definition of SLAs, specification of separation provisos etc. The second group comprised issues surrounding complaint management, versioning management, and en-forcing permanent efficiency improvements of the outsourcing vendors.

Cases 4 and 12 are examples for a more traditional understanding of IT outsourcing as part of an IT strategy. In both cases, the decisions were "make-or-buy" decision for parts of the infor-mation function. In case 4, the author used the term "outtasking" instead of "outsourcing", for which he gave the reason that "we don't transfer the people but only the tasks and redistribute the people to other areas." The concrete strategic issue was to determine in which areas which tasks were outtasked to which extent. The same principle held true in case 12. There too the strategic decision was about which tasks to outsource to which extent. A concrete instance for a strategic IT outsourcing decision pending at the time of the interview was the decision whether to outsource the company's data centre operations to an external provider.

Type of concern	Explanation and examples
Make or buy	The fundamental question of whether to perform specific IT functions in-house or to hand them over to external providers.
Sourcing arrangements	Decision on how to govern the co-operation with external providers including governance mechanisms such as SLAs, contracts and partnership relations.

Table 10: IT outsourcing concerns

The reasons for IT outsourcing decisions to be called strategic could be ascribed to their fundamental importance for the existence of the company (case 10), their potential contribution to cost savings (cases 4 and 10), and their function as a landmark entailing long-term planning commitments (cases 4 and 12).

4   Discussion

Having subjected the different comprehensions of IT strategy in our 12 interviews to a cross-case analysis in order to identify common IT strategic concerns (see Section 3), we will now turn our attention to the second part of our research by contrasting the resulting overall picture of IT strategy in practice with research on IT strategy as well as the corresponding academic debate. We start by contrasting our empirical findings with the academic debate on IT strategy in Section 4.1, discovering a substantial gap between the two. In Section 4.2, we analyse the nature of, and reasons for, this gap.

4.1   Introducing the academic debate

In order to compare our IT professionals' concerns in IT strategy with those investigated in academia, we are faced with the challenge of introducing the academic debate in a brief yet thorough manner. We meet this challenge by way of a literature review (see Methodology Appendix A.1.4). The essence of this review is summarised in Table 11; for a more extensive version we refer the reader to the Findings Appendix A.2.3. In principle, we were able to relate the categories of IT strategy concerns that we extracted from our interviews to the topics discussed in the academic community. But it is noteworthy that our literature review revealed two additional topics of major academic relevance that were hardly of any relevance to our practitioners: "IT/IS and competitive advantage" and "information as a resource" (see the last two rows in Table 11). We will introduce the nine categories and the related discussion in the following.

| Category.	Key concerns	Debate
Application systems	business systems portfolio, application systems development plans	++
IT infrastructure	Dominant technologies to be used and the sources from which the firm obtains them, technology choices and integration	+
IT architecture	Adoption of standards, principles for integrating heterogeneous technical components and applications	+
IT sourcing	Vertical range of IT function, choice of and management of relations with external service providers	++
IT organisation	Role and distinctive competencies of the IT unit, size, structure, and processes, systems supporting the IT function, distribution of power	+
IT human resources	Staffing, education and training, leadership principles, performance measurement, compensation	+
IT security	Security policy in general	o

Table 11: IT strategy concerns in academia

Competitive IS	Roles of IT in achieving a defensible competitive position, competitive impacts of information systems	+++
Information resources	Core information requirements and information resources, corporate-wide data plans	++

Table 11: IT strategy concerns in academia (cont.)

A discussion that is very influential to research on IT strategy is that on the competitive impacts of IT use. In our literature sample, publications on competitive effects of IT make up approximately four times the amount of research that focuses more narrowly on the content of IT strategy. Research on IT and competitive advantage originated in the 1980s with publications on so-called "strategic information systems" (SIS), i.e., information systems that give organisations a competitive edge (Senn 1992, p. 7, Wiseman 1985, p. 7; for a list of case examples see Kettinger et al., 1994). Later research departed from the immediate focus on the SIS itself and turned to the rationales underlying strategic information systems, resulting in the two distinct but complementary perspectives of Market Based View (MBV) and Resource Based View (RBV). The MBV is grounded in theories such as Porter's extension of industrial organization theory (e.g. Porter and Millar, 1985; Porter, 2001) and considers creating competitive advantage through a superior positioning in, and influencing of, the market environment. The RBV holds that the source of competitive advantage lies in nurturing and exploiting uniquely valuable company resources and competencies (for an overview see Wade and Hulland, 2004; Piccoly and Ives, 2005). Applied to IT, both perspectives suggest in essence that the application of IT (and related resources) for a competitive advantage is at the heart of IT strategy. If the long-standing engagement with this issue is indicative of its pre-eminence in IT strategy research, it is reasonable to assume that academics consider the competitive effects of IT a core element of IT strategies.

Besides the interest in the competitive use of IT, there is broad consensus in the literature that the application systems portfolio is part of IT strategy. As Earl (2003, 59) puts it: "It is conventional wisdom and practice" to see the core contents of information strategy as "an application development portfolio". Indeed, a huge number of articles suggest this interpretation (e.g. Lederer and Salmela 1996, Lederer and Sethi 1992, 1996; Gottschalk, 1999; Salmela, Lederer and Reponen, 2000; Ang, Shaw and Pavri, 1995, Lehner 1993). According to this literature, the primary strategic decisions to be made in IT strategy are on the application systems to be developed in the future. Accordingly, research has put great emphasis on rationales underlying and frameworks supporting SIS decision making (see Ward and Peppard, 2002, chapter 7 for an overview).

The idea of information systems – competitive or otherwise – being a core part of IT strategy is also supported by the different IT strategy models proposed in literature. Earl, for example, builds his widely perceived model on three questions for the "what", the "how", and the "wherefore" thus distinguishing between an Information Systems, an Information Technology and an Information Management strategy in his widely perceived model. His original model is depicted in Figure 1.
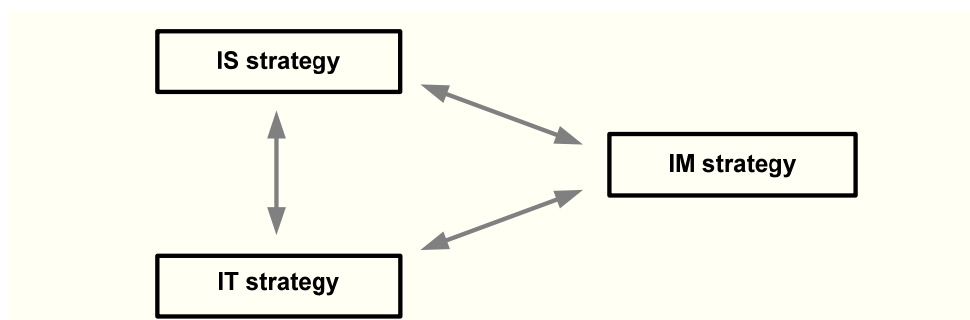
Figure 1: Domains of information strategy according to Earl (1989)

According to the Earl model, the IT strategy concentrates on technology and associated special-ised skills which provide the technical basis upon which information systems are based. It also defines vendor policies and takes account of emerging standards and risks. The idea of infor-mation technology decisions being part of the IT strategy finds much support in the broader lit-erature on IT strategy (see Table 18 in the Findings Appendix A.2.3). However, while it is com-mon to look upon technology decisions as strategic concerns, only little research has been done on what these concerns are or should be, and why. In other words, a lot of authors acknowledge that, for example, hardware plans should be part of IT strategy but only few au-thors analyse related decisions in more detail or propose frameworks to support them.

The Information Management (IM) strategy in Earl's model provides the management frame-work which defines how and to which ends the organisation will engage in IT-related activities. Since the term "wherefore" did not characterise IM strategy adequately, Earl later changed the question to "who" (Earl, 1996). Accordingly, one core concern in the IM domain of IT strategy is the IT organisation which includes considerations on the structure, roles, and processes of the IT function. A second concern is in human resources, which includes issues such as IT person-nel requirements, IT skills and IT personnel development. Apart from manifesting on some issue lists (see Table 18 in Appendix A.2.3), however, these two concerns have received little atten-tion in IT strategy research and in the broader field of IS research in general. This is especially true for the last decade, where the few publications on these topics are mostly conceptual and supported by nothing but some anecdotal evidence (e.g. Agarwal and Sambamurthy, 2002).

An updated version of Earl's model might consider IM strategy to also include IT outsourcing decisions. These also relate to the question of "who" is to carry out the tasks of the IT function with the internal organisation and external providers as fundamental alternatives. Outsourcing became an important issue for organisations in the 1990s and has only recently been revived by technology innovations which allow for new outsourcing forms such as utility computing or cloud computing. Hence, IT outsourcing has attracted considerably more attention in academia over the last two decades than the internal IT organisation or and human resources. Moreover, even though not usually a dedicated element of the academic IT strategy debate, research on IT out-sourcing is somehow strategic by nature. This is for instance indicated by the use of the term "IT outsourcing strategy" (e.g. Lacity et al., 2009). In addition, IT outsourcing studies analyse stra-tegic impacts by making extensive use of strategic management theories (e.g. Cheon et al., 1995; Gottschalk and Solli-Saether, 2005).

Furthermore, the latest discussion on IT strategy also suggests making information itself a con-cern of its own in IT strategy. This trend is also reflected in the latest version of Earl's strategy model which explicitly includes information as a planning concern (e.g. Earl, 2000). However,

this idea is not entirely new. The strategic role of information has been acknowledged in work on IT strategy very early on by taking account of business information requirements and corporate data planning. Moreover, the resource-based view on IT-based competitive advantage has been highlighting the role of information as a foundation for building organisational capabilities and (intellectual) core competencies for a long time. Recent support for exposing the role of information to the debate on IT strategy comes from authors that criticise the traditional focus on technology and its application. An example is given by Davenport (2000), who vigorously postulates to put the 'I' back into the debate on IT management. Maybe as a result, dedicated work has been done on "information strategy" more recently (e.g. Truijens 2004).

4.2 Contrasting academic debate and professional practice

Having given a short introduction to the academic debate, we will now turn our attention to the comparison with professional practice. To simplify the comparison, we have rated both the intensity of the academic debate and the practical relevance regarding our concerns on a "o" to "+++" scale (for details on the rating procedure see Methodology Appendix A.1.5).

We have noted earlier that our literature review is based on publications that are explicitly concerned with IT strategy and its contents (see Methodology Appendix A.1.4 for criteria on source selection). This qualification of our literature base is essential for a correct interpretation of the ratings: A low rating does not necessarily mean that a topic is ignored in the IS debate in general. In fact, we found far reaching discussions in the IS field that were somehow related to the IT strategy concerns we identified in our research (e.g. on IT infrastructure or IT planning in divisional organisations). However, our literature survey only included those publications that immediately addressed the "what" of IT strategy, i.e. its contents and related decisions.

Our comparison of what academics and professionals are concerned with revealed a mismatch, which is highlighted in a Kiviatt-style graph in Figure 2: The upper, darker area depicts strategy that are in the focus of the academic debate, while the lower, lighter part depicts those concerns that our IT strategy professionals' thinking centres on. The non-overlapping areas visualise gaps between academia and practice which we will discuss in the following.

Looking at the gaps from the viewpoint of academia, the most striking difference to professional practice is the attention paid to competitive information systems. The competitive potential of IT and its applications clearly dominates the academic discussion, whereas it was hardly a concern in the diverse companies we interviewed. Rather than thinking about how to employ IT proactively to move the business ahead strategically, the IT strategy agendas in our sample were largely developed in the spirit of providing optimal support to existing business strategies, and often our interviewees were completely caught up in that mind-set.

There is more agreement in regard to application systems which were a matter of concern in 8 out of our 12 interviews. Business applications are also a widely acknowledged concern in the academic debate on IT strategy, which focuses on the portfolio of development projects. In fact, five interviewees also highlighted the role of the application portfolio as an interface to the business. This is not to say that applications were not planned at all in the other cases, but they were planned on a project-by-project basis. In these cases, the decisions were made without an overall investment portfolio for information systems development, but relied on simple supply and demand mechanisms between business units and IT. One of our interviewees (case 3) explained his confidence in such mechanisms as follows: "I agree with Adam Smith in saying that

through the logic of the market this will take care of itself." Overall, our professionals' interest was primarily in the application landscape, i.e. the reach and range of the applications in support of business. The portfolio of development projects was only a secondary concern.
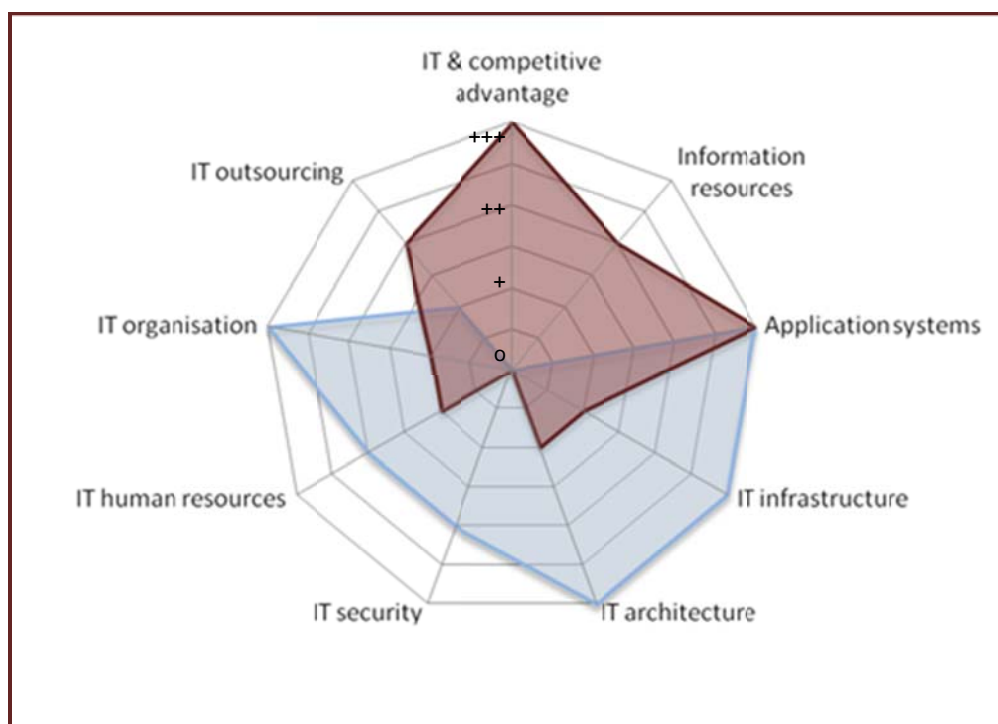
Figure 2: IT strategy concerns in academia vs. professional practice

As for the perspective of our professionals, we find that the concerns of most interest to them, IT infrastructure, IT architecture, and the IT organisation have not been really addressed by IT strategy research. This is not to say that these topics are underexplored in IS research in general. In fact, there is dedicated research on IT architecture (Aerts et al., 2004; Ross, 2003; Tamm et al. 2011) and on the characteristics of effective IT infrastructures (Weill and Broadbent, 1998; Kayworth et al., 2001). This research loosely refers to IT strategy (see for example Hay and Munoz, 1997; Weill et al. (2002)), but is not well integrated into the academic IT strategy debate. Accordingly, neither the status of IT architecture and infrastructure within IT strategies nor their relation to other planning areas such as strategic information systems or strategic information resources have been satisfyingly resolved so far.

This situation is similar with respect to IT security. Though security was only a concern in half of our cases, it was a dominant one in at least three of them. Nevertheless, IT security is largely excluded from the IT strategy debate (cf. Doherty and Fulford 2006). In fact, there is is dedicated research on IT risks and on the means available to provide IT security, but this research is mostly technical and often operational in focus.

4.3   Analysing and interpreting the gap

How can we account for the apparent gap between academia and practice? Taking a broad look, one can identify a range of potential explanations for this gap. We have, for example, found that only three interviewees from our sample used academic literature on the topic of IT strategy at all. The small selection of literature they actually had read (Carr, 2003; Weill and

Ross, 2004; Bernhard et al., 2003) is hardly representative of the academic debate on IT strategy. We might attribute this finding to practitioners' ignorance of the academic debate and the recommendations made there, eventually resulting in a deficient IT strategy practice. This explanation sees the major problem in a lack of awareness of academic sources in practice. Given that this is true, a better transfer of academic knowledge into practice should help closing the gap. However, there further explanations for the gap, some of which directly jumped out of the interviews, which put more challenges on academia.

One of these explanations is the perceived lack of relevance of concepts used in academia in practical contexts. Our professionals regarded concepts as not applicable in the concrete situations in which they found themselves. "Our situation is too special here" (case 3) or "I have to think it through myself anyway" (case 4) are typical examples of the statements we heard. Another explanation refers to the credibility of academic research in practice – irrespective of its relevance. One interviewee (case 4) explicitly pointed out that advice from academic literature neither seemed to be reliable to him nor could it be used to gain credibility in the boardroom. To gain credibility, the professionals in our cases used reports by analysts and consultants, which seemed to have much more weight than academic publications. Indeed, in some cases IT strategy formation was perceived more as a question of convincing top management than as having a sophisticated vision for the future of IS/IT. The following statement illustrates this point: "Typically you get consultants in to develop the IT strategy document. Then you use it and extend it for the next three years until you realise: okay, now we need a fundamental change, at which point you get the consultants back in. Thus, you systematically do not need any literature, because the crucial point for people dealing with IT strategy […] is to have an aid for convincing others why you want to do the stuff you do the way you do. And the best aid for convincing is of course you have McKinsey or Cap Gemini or Accenture in the company or something. Then you do not need to do a lot of convincing any more. Put in simple words, this is what's behind it" (case 11).

It is likely that a part of the lack of credibility and relevance our interviewees complain about is due to the limited size and quality of the empirical base of IT strategy research to date. The few investigations into IT strategy and its contents that have taken place have hardly established an empirically well-grounded body of knowledge. While some collections of strategic IT issues build on sources from (consulting) practice, the more theoretical approaches to model IT strategy often do without any empirical input (see Appendix A.2.3).

Another problem seems to lie in the currency of the academic literature and the topics it addresses. The bulk of research on IT strategy was done in the late 1980s and the 1990s. One of the dominating topics at the time was IT and competitive advantage, firstly addressed in form of "strategic information systems". This concern has by far not turned out to be as relevant in practice as it is in academia. Instead of focusing on the use of IT for competitive advantage, our interviewees highlighted the challenge of effectively and flexibly supporting business at affordable costs. This is furthermore evidenced by the frequent adoption of practitioner frameworks and standards such as the Information Technology Infrastructure Library (ITIL) in our study. It is also in accordance with the strong interest in corporate synergies we have found in divisional firms, often expressing itself in corporate IT strategies that commonly include such concerns as building reliable and flexible corporate IT infrastructures, enforcing standards and defining accountabilities–topics that have been addressed in current research (Tanriverdi, 2006) but that has not yet developed a strong connection to the IT strategy debate. In fact, our research indicates that

some of the discrepancy in IT strategy between practice and academia seems to be attributable to a difference in perspective in framing IT strategy. These differences are depicted in Table 12.

Strategy Level	Relevance in practice	Academic interest
Corporate level	++	o
Business (unit) level	++	+++
Functional level	+	++

Table 12: IT strategy perspectives in academia and professional practice

The dominating perspective on IT strategy taken in academic research is that of a single-entity firm or that of an isolated business unit in a divisional organisation. Accordingly, IT strategies are formulated either in support of a single firm-wide business strategy (in single-entity firms) or in support of a business unit strategy (in divisional organisations). A distinction between corporate and business (unit) level strategies is hardly ever made. This is in stark contrast to our findings, where the perspective of a corporate level IT strategy was taken in 5 of the 12 cases (cases 5, 7, 8, 9, 11). A notable exception is a paper by Wexelblatt and Srinivasan (1999) which proposes a procedure for carrying out IT planning in federated organisations. This procedure distinguishes between a corporate and a business unit level of planning and acknowledges the role of corporate infrastructures and services. However, when it comes to the contents of the respective IT strategies the authors hold that "sub-division plans will be similar in form and content to corporate plans" (Wexelblatt and Srinivasan, 1999, p. 270). This is in direct contradiction to our findings.

Moreover, literature repeatedly suggests IT strategy to be a "functional strategy" (e.g. Lehner, 1993; Smits and van der Poel, 1996; Smits et al., 2003; Adler et al. 1992). The authors do not define what exactly they mean by a functional IT strategy. If we apply the well-known concept of functional strategies from traditional management literature (Newman et al., 1989; Vancil and Lorange, 1975), we would expect departmental concerns to be addressed in the functional strategy. Such concerns would comprise the definition of departmental objectives, tasks and responsibilities as well as the allocation of resources to the IT department. Indeed, the notion of a departmental IT strategy was also present in our interviews (cases 3 and 4), but this pattern was not as dominant in our sample as might have been expected from literature.

5   Conclusions and implications for future research

In summary, our research supports the initial hypothesis that there is a gap between IT strategy research and practice. The results indicate that the academic debate is somewhat detached from professional practice and is in danger of becoming bogged down in issues that are of little interest for IT strategy professionals. However, this must be said with the necessary caution as concerns the limitation of our study.

5.1   Limitations of our study

As our research is exploratory by nature, our findings are subject to certain limitations with respect to validity and reliability. First and foremost, our results must not be looked upon as representative for IT strategy practice in general for a number of reasons. Firstly, we deliberately decided to choose IT strategy professionals as interviewees rather than a broader cross-section of IT managers or consultants. Besides the good reasons for this choice (cf. Section 2), we must be aware of the risk that some of the IT professionals we have talked to might be outliers – e.g. gurus – in their field that do not faithfully represent typical IT strategy thinking in practice. But the regular interactions of our professionals with IT managers from other organisations somewhat allay this risk.

Secondly, by limiting our research to organisations headquartered in German-speaking countries, we are at risk of having a national bias. Though most of the organisations our professionals work for do business on an international scale, we cannot discard the possibility of having captured a specific "German-type" culture of strategic IT planning. In fact, the Booz-Allen-Hamilton "orgDNA survey" (Bussmann et al., 2008) found evidence for a German-type mentality in IT management during the period of our own study including a strong service and execution mentality. If it were true that our findings are biased, we had to dilute related findings of our study.

Thirdly, our sample size is restricted by both our qualitative research approach and the choice of IT strategy professionals as subjects. Our interview base, though respectable in size for a qualitative study, is of limited statistical value – as any other selection of 10-20 interviewees would be. Notwithstanding its small size, we have tried to hedge for outliers or special circumstances regarding interviewee and organization in our collection of interview partners as well as possible in a small sample qualitative survey.

Most of the limitations so far do not only apply to this specific study but to qualitative research in general. Qualitative research seeks for a deeper understanding of a phenomenon in a particular sample, rather than generalising from the sample to the population. In order to improve the transferability of our results we have analysed the interviews in the light of their specific contexts according to the "principle of contextualisation" introduced in the Methodology Appendix A. This analysis helped us account for the similarities and differences in IT strategy concerns and concepts. Hence, we provide the reader with the results of this analysis in the Findings Appendix (Contextualisation).

Besides our efforts to ensure a certain transferability of results we have tried to improve the reliability by triangulation. First of all, we have triangulated the interview data with strategy documents from the respective firms. Secondly, the interview tapes and transcripts have been analysed from at least two different researchers autonomously in order to ensure inter-subjectivity

of the findings. In the case of disagreement, another researcher conducted a third independent analysis of the interview data in order to resolve these disagreements.

5.2 Conclusions

Our research has provided an overview of IT strategy concerns of expert practitioners. We have been able to identify some similarities among the IT strategy concerns of our interviewees, which, however, were too weak to be perceived as dominant patterns or recurring perceptions of IT strategy. Rather than being able to conclude consistent concepts of IT strategy from our interviews, we have to accept a certain amount of diversity in the issues that were perceived to be relevant to IT strategy. But more striking than any diversity we found in practice are the differences between practitioners' and academics' concerns in IT strategy (Figure 2). On the one hand, popular topics in academia such as IT and competitive advantage were hardly considered at all in practice. On the other hand, most concerns or major interest to our professionals play only a minor role in the academic debate. These include IT architecture, IT infrastructure, and the IT organisation as well as specific interests in application landscaping and in some cases IT in security.

Practice also frames IT strategy from a different perspective than academia. Academics discuss IT strategies predominantly from a business (unit) level perspective. Hence, they neglect concerns relevant from a corporate level view, such as the realisation of synergies by standardising IT infrastructures or streamlining the corporate IT architecture. But these concerns were of greatest interest to organisations of a certain size and to a number of our interviewees, especially to those in corporate level positions.

Why does this gap exist? Apart from national particularities that we cannot completely exclude our research suggests three possible explanations: The first explanation is a lack of awareness of academic recommendations in practice, even if these recommendations were well reasoned and applicable. This explanation points to deficiencies in the knowledge transfer between academia and practice, so that better accessibility to, and imparting of, the results of IT strategy research might soothe the problem. The second explanation is a lack of relevance of academic research in practice. The problem of academic recommendations not being fully applicable and useful in the eyes of professionals might be rooted in the fact that research is not always properly grounded in, and related to, contemporary practice. We have pointed out deficiencies in the size and quality of the empirical knowledge base of IT strategy research as well as in the currency and topics addressed by IT strategy research in general. The majority of research was done in the late 1980s and the 1990s and most of its efforts were spent on IT and competitive advantage. Our interviewees, in contrast, perceived IT in a supportive role to business, focusing on ensuring a reliable IT service supply with trouble-free IT operations and lowering IT costs. The third explanation is a lack of credibility. Academic recommendations do not seem to be compelling in the eyes of senior executives as they do not help bolster a case or gain credibility in the boardroom.

5.3 Implications for future research

Given the indications for a mismatch between research and professional practice (at least in the German speaking countries) and given that the Information Systems discipline accepts the challenge of offering practical help to managers, it is tempting to call for an adjustment of IT strategy

research in order to better accommodate the concerns of practitioners. However, we are aware of the risk that lies in directing research towards whatever practitioners demand (Galliers, 1995). Moreover, in the light of the limitations of our study, we look upon our conclusions as being preliminary. But though having to undergo further verification they might well serve as input for future research.

Input for an adjustment of IT strategy research can be drawn from the IT strategy concerns that have simultaneously been raised by our professionals as crucial and been neglected or ignored by academia so far. This input, however, can only be valuable if the underlying rationales practitioners give for considering specific IT concerns as strategic hold up to academic standards of research. Looking at the rationales given in our study, we have to conclude that not all of them are acceptable from a research perspective. This is primarily the case when practitioners superficially adopt strategic business terminology or simply point to the crucial significance that specific IT concerns have for business operations. In contrast, valid arguments are those that refer to significant effects on success and future prospects of the organisation. Among these are such effects as the irreversibility of decisions, their range (local vs. company-wide), the long-lasting impact on business strategy, the contribution to firm success as well as innovation and change for the foreseeable future. More research on IT strategy concerns and supporting rationales would take future theory development an important step further.

Nevertheless, with appropriate caution, our study suggests that academics have to be careful when working on IT strategy. As long as the suggested disconnect between practice and academia has not been resolved, research is in danger of focusing on issues wide of the practitioner's mark whose concerns are totally different. Equally problematic, traditional confirmative questionnaire research will yield misleading results in such situations. Respondents, when interviewed about IT strategy with standardised questionnaires, might answer questions with completely different interpretations in mind.

This danger is even greater as IT strategy research appears to be in a pre-mature and outdated state at the same time. It suffers from concepts and issues that are not well elaborated and agreed upon, whose successful application to topical IT planning problems has hardly been demonstrated. With the speed of IT development undiminished and environmental conditions continuing to change at a rapid pace, this unfortunate condition is not likely to change anytime soon. Hence, rather than trying to cure the side issues, IT strategy might well require a new approach in times when the information economy increasingly gains ground.

The dynamics of recent development in technology continue to drive more IT based virtual forms of organisation. Similarly, the development of IT also gives rise to interconnected and increasingly finer chased business networks and "business ecologies" (Moore, 1993) that are growing in number as well as size. Unfortunately, research so far has not yielded a clear picture of how IT strategy should be conceptualised under such conditions and what new approaches might actually look like.

There are reasons to assume that contemporary IT strategies are more strongly integrated into business in order to better accommodate new kinds of business strategies – business strategies that themselves need to be more readily adaptable, and precisely tailored to, an increasingly quicker changing competitive environment. IT is at the heart of virtual and networked forms of "Information Age" organisations so that we can expect it to be embedded into business planning. Given these conditions, we might explain the often narrow, mostly technical scope of our

professionals' focus with changed responsibilities for IT strategy: application systems planning might no longer be an exclusive concern of IT professionals. Rather, it might be done in close cooperation and even under the mandate of the business units. This assumption is supported by our professionals concerns in IT organisation which includes questions of defining the IT units profile as well as concerns in aligning IT rights and responsibilities with those of the business units. Further support is given by our observation that business units increasingly include IT-savvy personnel called "business system architect", "business IT analyst" or "requirements engineer". Similarly, since the notion of "core competences" relying on crucial capabilities and resources has been among the foremost of top management concerns for quite some time now, we might also hypothesise that information as business-critical resources are to some extent an inherent part of business strategy.

If this is the situation we face, the perceived technical focus of our IT professionals is less surprising. The technical infrastructure and its underlying architecture is stable enough for meaningful strategic decisions to be made on technologies, vendors, and standards as well as on the safeguards and security measures to protect it against breakdown and abuse. The applications, in contrast, change quickly with the strategic moves made on the business strategy level. The focus on technical infrastructure does not mean that business application needs are neglected. On the contrary, a strategically planned technical infrastructure enables both stability and reliability on the technical level as well as flexible responses to changing information needs and business requirements on the application level.

New research will reveal whether our suppositions on changes in IT strategy practice hold. But whether we turn out to be wrong about this or not, our research gives rise to the question whether the old ways that academia has conceptualised and theorised IT strategy have outlived their usefulness. To answer this question, we recommend that significantly more exploratory research in close touch with practitioners should be done. This research should not be afraid of discarding overcome ideas and concepts wherever they threaten to hamper progress. Such efforts might eventually result in a comprehensive and empirically valid IT strategy theory and thus eventually broaden our understanding of IT strategy making in the 21st century.

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Appendix

A.1 Methodology Appendix

A.1.1 Interview guideline details

For data collection, we used a semi-structured interview cautiously structured along a noncommittal interview guideline. This gave the interviewees room for expressing themselves freely and thus provided us with a broad and rich pool of information for our analysis. In general the interviews proceeded as follows:

- We opened the interview by collecting data on the interviewee's organisation and his role in the organisation.

- We then asked the interviewee to give a brief overview of the company's situation and business strategy with a focus on the role of IT in the organisation.

- This led over to questions about the firm's IT strategy. If the interviewee did not start talking about IT strategy concerns of his own accord, we asked him about the IT decisions that were considered strategic within his company. We also asked for the content of previous IT strategies, whether it had changed over time and if so – why it had done so.

- We went on by asking for reasons for viewing specific concerns as strategic. We also cross-checked the verbal information given by the interviewee with IT strategy documents at the site, if such documents were available. This helped us to control for what Argyris (1976) calls "espoused theories", which might include "wishful thinking", in contrast to the "theories-in-use".

In order to permit a diligent (qualitative) analysis we transcribed the interviews. For each interview we made annotations referring to the firm's situation including the role of IT, the position of the interviewee, the content of IT strategy, the reasons for seeing specific concerns as strategic, and any general ideas surrounding the notion of IT strategy.

A.1.2 Intra-case analysis methodology

We applied hermeneutics for analysing the interview transcripts. In doing so we followed the principles for conducting and evaluating interpretive field studies in information systems put forth by Klein and Myers (1999, pp. 71). The methodology aims at producing reflected, inter-subjectively comprehensible, 'thick' results, which are well aware of their limitations. According to the "fundamental principle of the hermeneutic circle", our analysis of the interviews moved from an understanding of individual statements on IT strategy contents to the expert's overall understanding of an IT strategy. Following the "principle of contextualization", the analysis was always fronted by taking account of the expert's context (e.g. his position in the organization, the organization's business strategy, the organization's size etc.), which would help us to better understand and frame the expert's statements. While analyzing the data we scrutinized such statements particularly critically as might have been induced by a leading question in order to meet the "principle of interaction between the researchers and the subject". We also adopted a critical attitude when analyzing the explanations of the interviewees and tried to detect and al-

low for biases or distortions in their remarks ("principle of suspicion"). Furthermore, the "principle of dialogical reasoning" informed us about the danger that our personal preconceptions and biases may subconsciously corrupt our analytical clarity. In order to better meet the last two principles we had the interviews annotated ("coded") and analysed by two different researchers independently, with the two researchers challenging their findings and looking for a third interpretation in cases of disagreement. This is to say that, last but not least, we exposed our conclusions to each other's critical scrutiny, following the "principle of multiple interpretations".

A.1.3 Inter-case analysis methodology

The main challenge of inter-case analysis lies in the development of overarching categories for the different IT strategy concerns mentioned by the interviewees. The process we applied to meet this challenge goes through a series of outward moving cycles. First, one case is taken and IT strategy contents for that case identified. The procedure is then repeated with a second case. Some of the IT strategy contents will be new, but others will resemble those of the first case. These like elements of the two cases are now conciliated into integrative categories that accommodate the findings of both cases. In the same fashion, the procedure is repeated for each remaining case. The challenge lies in integrating all IT strategy contents into common categories neither too general nor particular, but on a level with academic concepts to facilitate comparison. In doing this, we started by continuing our strict clean slate bottom-up approach, hoping that similar issues would be similarly understood and designated by our interviewees. For a couple of categories however, the homonymic and synonymic ways in which our practitioners used certain terminology (e.g. "IT governance") prohibited a purely bottom-up way of identifying similarity-based IT strategy categories. In these cases, we chose to apply terms and categorisations that are both, commonly understood in the academic discussion and grounded in practitioners' parlance. This means that in cases where essentially different decisions would end up being jumbled together under the same label due to varying concepts in the minds of our interviewees, we chose categorizations in line with academic literature. If, on the other hand, our interviewees used a common designator for a class of essentially common concerns, we adopted that designator.

A.1.4 Literature review methodology

Following Webster and Watson (2002), we started our literature review with a keyword search from several literature databases, giving access to a broad spectrum of international IS and business journals . The extent to which leading journals according to the ISWorld ranking (AIS 2007) are covered is depicted in Table 13.

Journal	Starting Year	Starting Volume	Source Used
MIS Quarterly	1977	1	EBSCO
Information Systems Research	1990	1	EBSCO
Communications of the ACM	1965	8	EBSCO
Management Science	1954	1	EBSCO
Journal of Management IS	1984	1	EBSCO
Decision Sciences	1970	1	EBSCO
Harvard Business Review	1922	1	EBSCO
European Journal of IS	1993	2	Proquest
Decision Support Systems	1997	19	EBSCO
Information & Management	1977	1	Science Direct

Table 13: Coverage of international top journals by database search

We searched EBSCO/Business Source Complete, Proquest/ABI Inform and Science Direct for the string "(Info* OR IT OR IS) AND strategy*" in title, abstract and keywords. This search resulted in 1235 articles. (The large number of results must be attributed to the fact that the EBSCO database does not allow for case sensitive searches. As we had to include "IS" and "IT" in our search string, this resulted in including many articles containing the verb "is" or the word "it".)

Some relevant articles are invariably overlooked in such a search while a large amount of irrelevant articles are found. In order to overcome these shortcomings we also conducted a manual scan of the titles and abstracts of all volumes (starting 1970, before that, information strategy has not been discussed) and issues of leading relevant IS and business journals listed in the ISWorld ranking (AIS 2007). Relevant for our purposes are high ranking journals that are most likely to cover strategic topics (e.g., by having strategy/strategic management in their title, or explicitly mentioned in their mission statement/as core topics). Table 14 summarizes the journals covered in this manual scan adding another 419 further articles.

Journal	Starting Year	Starting Volume	Primary Field
MIS Quarterly	1977	1	IS
Information Systems Research	1990	1	IS
Journal of Information Technology	1998	13	IS
Journal of Management IS	1984	1	IS
IEEE Transaction on Engineering Management	1994	41	IS / IT
Information & Management	1977	1	IS
European Journal of Information Systems	1993	2	IS
Journal of the Association for IS	2000	1	IS
Communications of the Association for IS	1999	1	IS
Journal of Strategic Information Systems	1991/92	1	IS
Management Science	1970	16	Business
Harvard Business Review	1970	48	Business
Academy of Management Journal	1970	13	Business
Academy of Management Review	1976	1	Business
Strategic Management Journal	1980	1	Business

Table 14: Journals included in manual search

We then reviewed the abstracts of all articles of our literature base for relevance. This led us to exclude 1253 articles (984 from the database and 269 from the manual search) from the relevant literature base. The excluded articles were either not related to strategy as defined in the working definition or were not related to IS/IT in any way.

Hence, this review left us with 401 articles that were somehow related to IS/IT and strategy. Our focus is on IS strategy and its content which is distinct from the process and the impact. Categorizing the 401 articles into these categories, resulted in only 43 articles covering the content of IS strategy (i.e., 358 articles were covering either the process or the impact). When reading these 43 articles in depth, we discovered references to 5 other articles covering the content of IS strategy, finally resulting in 48 relevant articles for this study.

A.1.5 Rating methodology

The rating of the practical relevance of the IT strategy concerns refers to the number of cases in which a concern has turned out to be explicit, implicit, or absent in our interviews as summarised in Table 3.

Rating Criteria for Professional Practice

o	Has been an independent concern in less than three cases.
+	Has been an independent concern in at least three cases
++	Has been an independent concern in three cases but also an implicit concern in other cases OR has been in independent concern in the 4-7 seven cases
+++	Has been an independent concern in more than 7 cases and an implicit concern in other cases

Table 15: Rating the relevance in professional practice

Table 16 summarises the rules for rating the prominence of IT strategy concerns in the academic discussion. It is important to note that the fact that academic research acknowledges a certain concern to be relevant to IT strategy does not justify a high rating by itself, but it is rather a necessary precondition for the academic debate to be vivid. However, a top rating requires thorough research being done on related issues and on the rationales for making decisions.

Rating Criteria for Academic Discussion

o	Related issues attract marginal interest and research efforts
+	Related issues are only sometime mentioned in the academic debate OR they are partly acknowledged but are not given much research interest
++	Related issues are partly acknowledged in the academic debate and some research efforts are devoted to them
+++	Related issues are often discussed in the academic debate and considerable research efforts have been devoted to these issues

Table 16: Ratings the relevance in the academic discussion

A.2   Findings Appendix

A.2.1 Intra-case analysis results

This section presents what we have learned about IT strategy from each of the interviews by shortly outlining each of our twelve cases individually. In order to maintain reasonable brevity, we have confined the display of our findings to a limited selection of the contents uncovered. Therefore, we primarily focus on those IT strategy contents that we have distinguished as our professionals' primary concerns. In our presentation, we first mention the respective organizational key data with regards to the expert and his unit before presenting the major IT strategy concerns. We conclude with a short assessment of these concerns in light of the respective case's particularities.

Overall, the experts were very open to sharing their thinking on IT strategy content with us. Many of those who documented their strategies additionally provided us with, or gave us temporary access to, their official IT strategy documents and presentations, at least on the level of the table of contents.

Case 1: Insurance – national company

The two experts interviewed in case 1 work for an insurance company in Western Germany with attached independent sales agents across most of the country. The two experts hold staff positions in the IT Infrastructure department and report to its head. The head of IT infrastructure himself reports to the CIO, who is part of the board of directors. One of the experts holds the title of "Director IT Strategy". The core responsibility of both experts lies in dealing with the IT strategy of the insurance company. Hence, they devote most of their working time to planning, developing, realizing and monitoring the IT strategy. During the interview, both experts named a series of current and past IT strategy decisions: the decision to use only standardized software instead of (in-house) developments, the focus on Linux as a "strategic OS", the realization of a concept of thin-client computers in combination with central data hosting and their linkage through a voice- and data-integrated network, the decision to use dynamic functionality in the web-browser (e.g. ActiveX or Java Applets), the implementation of Lotus Notes as the central document management system (DMS), and the decision to provide failure-free workplaces. IT strategy decision making is prepared by the two interviewees and then discussed and decided on at "IT strategy workshops", which roughly take place every two to three years. The workshop participants, besides our interviewees, are the heads of the company's functional departments and the CIO. All IT strategy decisions are documented in IT strategy handbooks, which are regularly updated and distributed to the staff.

The IT strategy decisions mentioned by the two experts have a clear technological focus. Apart from the somewhat particular decision to provide failure-free workplaces, they mainly deal with the basic hardware and software infrastructure of the company. The main tendency is to standardise or unify components.

Case 2: Insurance – federal company

Similarly, the expert in case 2 also works for an insurance company with attached local sales agents. He is the manager in charge of IT development and reports directly to the board of directors. The first IT strategy decision the interviewee mentions is the decision to establish a close cooperation between the IT departments of his company and a sister company in order to realise synergies. Shortly after this cooperation was started, the two companies merged and the two IT departments were fused into one large IT department. As a result, the manager decided to supplant a so called "evaluation committee". Its main task was to deal with the budgeting of the IT application portfolio-related project requests, which were submitted by the functional departments. The aim was to increase cost awareness and develop a feeling for which applications were really needed. From then on, the functional departments had a much greater influence on the shape of the company's IT application portfolio. Consequently, the application portfolio increasingly featured a wide variety of different software applications. As a result, necessity was turned into a virtue and it was strategically decided to turn the capability of integrating and running a great variety of applications into a core IT competence. The interviewee speaks of one of the "widest application landscapes in Germany, perhaps Europe" and says that "whatever application comes along, completely irrelevant if purchased or developed in-house and which architecture the developer would like to have – we integrate it!" Whilst the application landscape is fluid and flexible, it is the strategy to keep the IT infrastructure rather stable. The reason why decisions concerning network topology, DBMS, OS, etc. are seen as strategic is that "many of our systems have a life expectancy of 10 years, some even 20 years." IT strategy decisions are

made as part of a regular process, usually once a year, by evaluating business strategic decisions from which new IT strategy decisions are derived.

Case 3: Health care

In this case the expert holds two parallel positions. He is the CIO of the whole corporation as well as managing director of the corporate IT function. The corporation acts in the health care market worldwide and has three subsidiaries, which carry out the different operations of the company. During the interview period, the company was aiming for massive growth and hence restructuring parts of the business and the IT organization. The interviewee names a couple of IT strategy decisions that were made during this time of growth. The first one is the complete replacement of the current business applications at that time with SAP R/3. "The old IT simply could not cope any more. It was designed for a company with 150 million euro revenue max. And it was supposed to support a business that, by that time, had already 2 billion euro in revenue! […] So we needed to take it to the next technological level. We needed higher transaction volume and higher flexibility at the same time in order to support the newest business demands". The second decision named was to restructure the IT department into an internal service provider offering its services to the other subsidiaries. Thirdly, it was strategically decided to use Sun Solaris as the basic OS and Informix as the central DBMS. The turbulent phase the corporation lived through at that time is reflected in a couple of extraordinary IT strategy decisions the interviewee mentions. First, there was the strategic decision to spin off the corporate IT function as an independent IT company in order to be able to offer software applications developed in-house to the open market. As part of a second major IT strategy decision, however, the first move was reversed soon thereafter and the newly created company was dissolved and reintegrated back into the parent corporation because it had to refocus on providing services for the other parts of the corporation.

Case 4: Finance – public institution

The expert of this case is the "Director Information Systems" in a large European public financial institution. Since the department he leads is responsible for all matters concerning IT in the organization. The expert's view on IT strategy in this case is highly structured and systematic. He looks upon IT strategy as being composed of eight interrelated layers: Mission and Vision, Culture, Market, Product Architecture, Delivery Organization, Staff and Skills, Sourcing, and Performance Management. Strategic IT strategy decisions are made on every layer, e.g.: How do we see ourselves and where are we now and where do we want to be ten years from now (Vision and Mission)? Which attitude and behaviour towards IT do we expect from our employees (Culture)? To whom do we provide our services? What does our product portfolio comprise (Market)? What is the design of our application architecture, our technical architecture, and our security architecture (Product Architecture)? How are we (the IT department) organized and what do our processes look like (Delivery Organization)? Which capabilities do our employees need and how can we train and promote them (Staff and Skills)? Which part of our operations do we want to run in-house and where do we (not) have the economies of scale (Sourcing)? How do we monitor our operations and how can we determine our success (Performance Management)?

A set of examples might illustrate how this highly systematized IT strategy translates into practice. One concrete IT strategy decision was that of implementing a security architecture, named

"2½ node concept". This implied that every piece of IT hardware and all the digital databases of the company were triplicated so that in addition to the live system there were two backup systems in different locations of the globe, both of them ready for an immediate hot-swap in case of a breakdown or catastrophe. A second example was the decision to set up dedicated IT service portfolios for each customer (business unit), the portfolios themselves being subdivided into application services, infrastructure services and three types of transaction services. This was meant to simplify operations and communication with other departments. A last example concerning staff and skills was the decision to limit the duration of all newly signed work contracts to a few years (depending on the position) in order to make hiring and firing of unsatisfactory or no longer needed employees more flexible.

Accordingly, these above mentioned and numerous other decisions paint the picture of a highly systematized, thoroughly reflected IT strategy in which nothing is left to chance. All decision areas are clearly defined, individual decisions are coordinated, build upon one another, and refer to one another. Besides organizing the content, the eight layers also provide chronological orientation. An IT strategy decision cycle (and thus thinking about the IT strategy and its planning) begins with vision and mission and eventually ends in measuring its success, which sparks the next cycle.

Case 5: Telecommunications

The interviewee of case 5 holds the position of "Vice President Corporate IT Management" and leads a corporate IT staff unit in a large international telecommunication company. Next to the corporate IT staff unit there are local IT departments in most of the numerous business units of the company and one IT service provider that is a corporate subsidiary. The expert describes his job as this: "I work for the CIO of our corporation. It is my job to look for potential competitive advantage through IT for the corporation as a whole and to look where IT is critical for individual business units." The IT strategy agenda of the expert and his staff is dominated by four major decision areas. Firstly, he has to decide strategically about IT application architecture guidelines that regulate development and procurement of all application systems for the business units of the company. Secondly, similar decisions are made regarding the shape of the IT infrastructure. Regarding this, the expert and his staff unit decide about the number of different basic technologies and application platforms (e.g. DBMS) that are operated simultaneously in the company without restricting any precise manufacturer or model. Thus, while there is an upper limit on diversity, the systems to use are not prescribed top-down but left to business unit agreement. Aim of this standardization effort is to achieve a higher degree of homogeneity and controllability of the corporation-wide IT infrastructure. This same aim is, thirdly, also followed by the IT strategy decision to expand the IT responsibilities of the corporate IT staff unit at the expense of the local IT departments in the business units. The fourth decision area in the purview of the corporate staff unit relates to how the IT as service provider to the corporation is strategically organized and controlled (e.g. whether it is managed in a profit centre or a cost centre structure).

As described above, the IT strategy decisions in this case deal with very fundamental issues. On the one hand, they provide architectural and infrastructural guidelines without going into detail, e.g. as to what concrete DBMS to procure. On the other hand, they set the playing field for IT in the company. They regulate competencies, responsibilities and interplay of all IT units of the corporation including the IT subsidiary, for which they also lay the organizational cornerstones. Again, attention is not paid to the detail, but to fundamental issues such as the question of profit vs. cost centre structure.

Case 6: Finance – investment bank

In case 6, the interviewee is the "Director IT Department" of a small private Swiss investment bank. The bank is a legally independent subsidiary of a bigger banking conglomerate that operates worldwide. At the time of the interview, the bank had been experiencing a prolonged period of massive growth in terms of employees, revenue and profit. This special circumstance is reflected in most of the strategy decisions identified by the interviewee. Rather than talking about IT strategy in any systematic way, the expert names a number of mainly technological decisions that try to support and enable the aforementioned growth in the best possible way. A first example is the decision not to adopt the banking platform of the parent banking company, but to use a different, independent platform based on a set of simple standard applications such as Solaris and Oracle. The aim of this was to gain a higher degree of independence from the parent bank as well as flexibility to support the latest business requirements. The expert explains: "through this independence, particularly in IT, we can respond to new situations very fast. If the bank decides to expand its range of structured products, we are able to put the IT related requirements in effect very quickly". If the bank decides to open a new branch anywhere on the globe, "we can support that in no time." A second example is the decision to make web-based access available to relevant bank applications for external asset managers who are legally independent but work with information provided by the bank. This would make the company more independent from technical failures or breakdowns at the many small asset managers' offices as well as rendering it able to quickly scale up or down the number of asset managers under contract. A third example is the decision to institutionalize a so called "Project Portfolio Board" in order to bring together people from the business and the IT as participants in the IT strategy decision process in order to make both sides more aware of each other's capabilities and limitations. A special problem to be remedied here was the frequent misjudgement on the part of the business of just how quickly the IT could respond (or not respond) to ever changing requirements resulting from massive business growth. A last example is the decision to not develop any applications in-house, but to solely work with standard software from external suppliers. This decision developed over time: At the beginning, developing applications in-house had not been an option due to lack of personnel. After several years, it was eventually officially declared a strategic orientation and became an explicit part of the IT strategy.

Case 7: Logistics

The expert in this case holds the position of "Global Head IT Logistics" as head of an IT unit located in the business unit responsible for international logistics of a global logistics corporation. The corporation also features an IT service provider subsidiary with a staff of over 5,000 people. The interviewee and his unit are responsible for what he calls the "demand" side (as opposed to the "supply" side) of the IT issues of his business unit. He reports to one of the board members. While the supply side actually engages in the 'shop-floor' work, e.g. in implementing applications and providing maintenance (and is usually carried out by the internal IT service provider), the demand side is responsible for providing a more strategic outlook on IT that tries to gauge business interests and meet them with IT capabilities. The IT strategy decisions he has to make are mainly about coordinating the many international branches of the BU. One major example mentioned in the interview is the continual re-alignment of the application portfolio. The repeated concern here is to decide whether it would be preferable for a particular task to have one application for all branches or individual applications at each branch. Usually, the more likely it is that a certain functionality will also be needed in other parts of the world, the more likely a

common application is developed. The situation is similar when it comes to the network connections between two or more branches: "If you have an external service provider and you take one of your branches and both of them are in the USA, and they want to exchange information, the network question is not that important. They simply have to work it out and can decide it there. But as soon as we want to connect all of our US branches with our US headquarters, then I regard it as a strategic decision as to how we are going to do that". Another major strategic IT strategy issue is the allocation of the IT-related rights and responsibilities between the "local IT princes" and the interviewee's IT unit. The higher the need for international coordination, the more likely the strategic decision is made towards centralized control. The main goals behind all the decisions are to reap the synergies where they can be realised, and the facilitation of future IT endeavours that are of paramount importance. The expert puts it this way: "if there is a decision in one branch that I can see will also be important for other branches in the future, then I would like to make the decision such that I can extend the results to other branches."

Case 8: Finance – universal bank

The interviewee of case 8 is the "Deputy Head of Corporate IT Strategy" and heads a corporate IT staff unit in a globally active universal bank structured into eight business units. Apart from the corporate IT staff unit, there is an IT department in each business unit. The interviewee and his staff unit focus on topics in their IT strategy dealing mainly with IT architectural and infrastructural deliberations of standardisation and prescription vs. diversity and independence. This mainly involves strategic decisions on the levels of IT infrastructure, basic software (e.g. operating systems), and business applications (e.g. ERP) on where and how to regulate centrally and where to allow business unit independence. Whereas local applications can be designed and implemented locally in the business units (as long as they adhere to the central standards), applications that have a (potential) corporate-wide effect need the approval of the central IT unit. Furthermore, the recurring approval process constitutes another major IT strategy decision area. The strategic tasks here are to evaluate the applications for adherence to the central standards and approve and prioritize their funding. Moreover, the same pattern applies to the third IT strategy decision that the interviewee brought up during the interview, the decision regarding the distribution of IT rights and responsibilities between the corporate IT unit and the respective business units' IT departments.

In general, the main factor behind the IT strategy decisions in this case is the aim for maximum cost efficiency. The agreement on infrastructural IT standards aims at economies of scale, e.g. when buying licenses or regarding running costs. As the interviewee puts it: "If I have a homogeneous landscape in my computer centre, I do not need too many IT specialists; I can run a different shift work; and I need fewer people than if I really had a zoo." The compliance to the standards and rules set is strictly controlled by the corporate staff unit. While the business units have the right to develop and implement certain software applications on their own, they cannot override any standards set by the central staff unit.

Case 9: Public transportation

The interviewee in case 9 holds the title "Head of IT Corporate Strategy" and leads a corporate IT staff unit in a globally active logistics corporation which is structured into 5 business units and owns 5 subsidiaries. One of the subsidiaries is an IT service provider. Additionally, every subsidiary and business unit has its own IT department. During the interview, the expert named

several IT strategy decisions. They consist of infrastructure, application as well as rights and re-
sponsibilities-related topics. Across all areas, the setting of frameworks and guidelines is the
main concern. Strategic decisions are, for example, the number of basic applications and the
number of development tools such as process models or CASE-tools in the corporation. The
main goals here are to create comparability and translatability between the IT efforts of the dif-
ferent business units and subsidiaries, and to limit costs by standardization. In terms of IT rights
and responsibilities, the corporate staff unit's IT strategy deals with allocating the IT-related
rights and responsibilities among the business units and subsidiaries. One example here is the
newly implemented "cascade organization", which regulates where the rights and responsibili-
ties defined in the new "IT security directive" are allocated within the corporation. A dedicated
"CIO-Board" that includes the CIOs of the subsidiaries and the corporate IT staff unit monitors
and discusses all IT strategy-related efforts on a monthly basis.

Case 10: Finance – direct bank

This case's expert is the "Head of IT Strategy" and is one of two people responsible for IT in a
small direct bank that came into existence in 1999. By statute, the bank was not allowed to em-
ploy more than 25 people at the same time. Due to this limit, almost all operations of the bank
(not only IT-related) are outsourced, including all IT operations and some IT management tasks.
As a result, the IT strategy topics dealt with in this case revolve almost entirely around IT securi-
ty and sourcing. One of the many strategic sourcing decisions the interviewee makes regards
the meticulous design of the contracts with possible outsourcing partners. All processes have to
be described in detail and underpinned with costs in order to make them transparent and com-
parable. All services rendered by the partner are equally meticulously described in service level
agreements. In addition, the partner has to adhere to certain security regulations, submit to
constant process optimisation requirements (he must become more efficient over time) and
consent to codified precaution agreements in case of a later separation. Then, the content of
the complaint management, versioning management and innovation management that concern
the active cooperation with a partner is considered an IT strategy decision. With regard to IT se-
curity, IT strategy decisions comprise the manner in which current partners are monitored and
controlled (exemplary tools are robot customers testing functionality, server attacks through
hired hackers, on site control of the servers at the outsourcing location through data security
specialists, etc.) and the cooperation with international private detectives in order to effectively
pursue IT criminals. The overriding goal looming largely over all of these painstakingly managed
outsourcing and security issues is to prevent anything unforeseen from happening and, thus,
ensure the ongoing existence of the bank. For direct banks, the inaccessibility of the website, an
outage of one of the central servers, or a large scale phishing attack can entail an immediate
shutdown of the whole business. As the interviewee put it: "If we have a security breach some-
where, we have to close down our whole business." Second only to the survival issue is the aim
of cost-efficiency. The business model of the bank as a young and relatively unknown direct
bank is predicated on the idea that it can offer its services cheaper than traditional brick and
mortar banks with established images and brands. Says the expert: "A discounter, that's what
we are. We don't have a broad product range. We are cheap – a bit like, say, Aldi. Yes, Aldi [an
internationally operating discount grocery retailer]." Hence, the very detailed IT outsourcing
management also serves the purpose of "creating clarity of processes, costs, and services for
the management from day one. Because every board member wants to know: 'What are the
costs of our loans and what do they fetch?' And they want to know that for every single one.

They don't want to offer anything that makes no profit. And the same goes for our accounts [and all other products]."

Case 11: Air transportation

The expert in case 11 is the "Head of Corporate IT strategy" and presides over a corporate IT staff unit in an international transportation corporation structured into more than five business units and three subsidiaries. One subsidiary is an IT service provider, each business unit and subsidiary has its own IT department. The major IT strategy concerns of the interviewee and his staff unit are to realise economies of scale and allow reusability.

The interviewee here presents a very sophisticated understanding of an IT strategy. He differentiates very subtly between different perspectives on IT strategy within the organization depending on who is concerned: "If we are talking about IT strategy, then we are talking about at least one IT strategy for each business unit and one for the corporation on the whole." He further differentiates between an IT strategy of a business unit and a "business" strategy of an IT department. He and his staff unit are responsible for the IT strategy on the corporate level. One major concern on his IT strategy agenda is the prioritization and coordination of IT projects spanning across or having an impact on large parts of the corporation. In contrast, IT projects that are not of major importance can be approved and carried out in the local IT departments of the business units. Such projects are not his concern. They may, therefore, be IT strategy projects for the respective business unit, but not from a corporate perspective. A business unit might well need a "strategy in the sense of when and how to introduce, e.g. Netweaver, because this takes a mid to long-term perspective. In terms of the product, this is naturally an important strategic question, but from the corporate viewpoint it is of course completely irrelevant." On the third level, the business strategy of an IT department, the interviewee sees questions answered strategically that affect the operational quality of the respective department. Examples would be how SLAs are structured, how contracts with partners are designed and which products are offered. He recognizes that due to the different purposes of these IT strategies, whether a decision is regarded as strategic or not, depends on the viewpoint.

This complex interplay of IT strategy on different levels with different scopes and contents is largely driven by the "decentralized philosophy", as the interviewee puts it, of the corporation. Every business unit is given as much independence and local decision-making power as possible. The executives of the business units have a relatively broad authority over their business and IT decisions. Therefore, only IT issues that are strategically important on a corporate scale are in the scope of the interviewee and his unit. For the most part, these issues are concerned with the prioritization of corporation-wide application demands; establishing the organizational prerequisites for carrying out such application projects; and setting standards in the areas of IT infrastructure, basic applications as well as IT operations (e.g. process standards, process management standards). The main point in which an IT strategy decision on the corporate level differs from those on lower levels is that they enable significant economies of scale through organisation-wide unification and multiple system usage.

Case 12: Industry

The interviewee in this case holds the title of CIO and leads the corporate IT function of an international ceramics manufacturer, organized in three business units. Major IT strategy deci-

sions named by the interviewee are: the standardisation of the company's business software across its international locations through so called "harmonisation guidelines"; the decision concerning which IT infrastructure to use company-wide (e.g. Linux as OS); the prioritisation of applications to develop company-wide; the sourcing of IT operations-related tasks (e.g. network management or data centre operations); and the arrangement of the cooperation between the business units and the IT department. Specially, the last decision was the current one at the time of the interview. The expert had just strategically decided to organize the central IT as a "shared service centre" and introduce a "key account organisation" that determined that every business unit should delegate one dedicated person to the newly created service centre. In turn, this key account manager should collaborate with the IT department on IT issues including questions of strategic rank, while representing the interests of their respective business unit. The overall aim of the IT strategy here is to strike the balance between optimal cost efficiency and the support of business needs as well as possible.

A.2.2 Contextualisation

Contextualisation is based on the assumption that differences in the context of the phenomenon under investigation account for idiosyncrasies (also see the "principle of contextualisation" explained in Methodology Appendix A.1.3). Our research allowed us to identify some context factors which might explain part of the diversity in IT strategy contents.

According to our interview design (see Section 2), we see the most important context setting in internal and external organisational factors surrounding the formulation of an IT strategy. Our analysis strongly confirmed this assumption. We could identify the size of the organisation, the size and responsibility of the IT unit(s), the business strategy pursued, the general attitude towards and the role attributed to IT and organisational history (path dependencies) as important situational aspects which have an effect on the concepts and contents of IT strategies. The only non-organisational factor we found to have influence on the IT strategy perception was the strategist's personality. However, the influences of this personal factor strongly varied with the different personal profiles (e.g. leader vs. guru) and educational backgrounds (e.g. business management vs. computer science or engineering) of our interviewees. So our focus in this section will be on the organisational factors.

IT strategy level: corporate vs. business

The perhaps most striking situational factor is related to the organisational level of the IT strategy expert and the organisational anchoring of his unit. In a number of cases (cases 3, 5, 7, 8, 9, 11, and 12) the interviewee was responsible for making IT strategy decisions on corporate or group level, e.g. in a corporate IT staff unit. The resulting strategies address the whole corporation comprising potentially many different business units or subsidiaries. In the other cases (cases 1, 2 4, 6, and 10) our interviewee was of a single-entity company.

In the corporate cases great emphasis was laid on centralisation vs. localisation issues across all decision areas. IT standardisation, architecture and governance were the dominating concerns. Issues such as setting corporate-wide IT infrastructure standards or prioritising locally submitted applications in a corporate-wide application portfolio were typical items on the IT strategy agendas. The underlying rationale usually was to balance individual business needs with the realisation of synergies. For the expert in case 5 the main question is: "In which busi-

ness areas is IT so critical that it makes no sense to consolidate IT systems across divisions, and where is just achieving synergies the main goal?" This view is supported by many other interviewees (cases 5, 7, 8, 9, 11, 12), an example being the one of case 9, who states that "part of IT strategy is deciding where there could be a benefit in not doing it five times, but only once". Regarding IT rights and responsibilities, the motive of setting corporation-wide regulatory frameworks is even more explicitly pronounced. Setting such frameworks is seen as implementing "tamers for the autonomous and diverging agents" (case 8).

Business strategy

A second important influencing factor is the organisation's overall business strategy. In many cases, the influence of the business strategy happens through the IT strategy makers' taking business strategy decisions as a starting point for IT strategies. For the interviewee of case 8, for example, the IT strategy is "the result of an as we hope logically thought out reduction from an as we also hope logical and explicit business strategy. Because this is the origin of all IT strategy: first of all, I need a business strategy." In cases 3 and 6, the respective business growth strategy has a decisive influence on the IT strategy. In case 6, the business pursued a massive growth strategy while being a relatively small bank and therefore starting from a rather small level. IT was expected to play a big part in making this growth possible, which subsequently shaped the IT strategy a great deal. All the IT strategic decisions raised by the interviewee in this case aimed at enabling and ensuring the flexibility and independence needed to realise the business growth strategy. This is also tellingly reflected in the official label "business driven IT strategy" which is given to the IT strategy in this case. In case 2, the strategic business decision to merge two hitherto independent companies led to an IT strategy focusing on the fusion of the IT departments and on setting up a common IT and middleware infrastructure which support easy integration of different applications.

Organisational legacies

We identified organisational legacies and idiosyncrasies as another relevant influencing factor. A good example for this influence is case 12, where the newly appointed CIO's first duty was to restore the reputation of the IT department. This reputation had been blamed for wasting money in the past. Two have been informed by the problematic history of the IT department: The decision to introduce a complex shared service centre and the introduction of sophisticated "harmonisation guidelines" to standardise applications across business units. Interviewee explained that when he began his job as CIO, "the IT came very close to being completely outsourced. […] It costs were nearly twice as high as today so that IT had a very difficult standing". Only by means of a "brutal cost management" had he been able to regain acceptance by laying a foundation for a more cost-efficient and customer-oriented IT strategy. "With an IT that costs too much you can make as much strategy as you want – nobody is going to take you seriously."

Attitude towards IT

The role IT plays in and for the organisation is another factor we need to mention. This factor refers to what the business expects IT to be and to do for the organisation. Looking at case 10, for example, IT is absolutely vital for the survival of the company, seeing that it is a direct bank. Accordingly, it comes as no surprise that IT security and IT outsourcing management were the primary – and almost exclusive – IT strategy concerns in the company (cf. case 10). More gen-

erally, may interviewees expressed the business belief that IT exists to fulfil business needs. An illustrative example gives case 12: "[the CEO] doesn't care whatsoever if I've got little green mice on wheels which spin the disks in our hard drives. He doesn't ask which providers I use and which brands I procure. […] But our application roadmap has to meet his expectations to 100%". Consequently, in terms of IT as support vs. IT as enabler, we find that IT is almost exclusively just regarded as a mere "tool" (case 9) or as a "production factor" that has to serve the business needs as efficient and effective as possible but "does not have to follow the latest hype" (case 12). The expert of case 11 brings it to the point: "Ultimately, the question that it comes down to is what the role of an IT organisation in such an environment [as ours] really is. And this role is that we see to it that the projects coming from the business are implemented eventually and that the applications keep running. That is a clear, understandable duty. But nobody really expects that that we help think about what the right projects are."

A.2.3 Literature survey results

We suggest grouping literature into two streams. The first stream is does not investigate the contents of IT strategy directly but it is influential to thinking about it. This stream concerned with competitive uses of IT (for a recent review cf. Piccoli and Ives, 2005). Grounded in theories such as Porter's extension of industrial organization theory (a.k.a. the Market-Based View; e.g. Porter and Millar, 1985; Porter, 2001) or the Resource-Based View (for an overview see Wade and Hulland, 2004; Piccoly and Ives, 2005) literature in this stream suggests that the application of IT (and related resources) for a competitive advantage is at the heart of IT strategy.

The second stream is the one our literature review focuses on, since it is directly concerned with IT strategy contents. Our review provided us with 48 academic articles which are summarised in Table 17.

Journal	Ref.	Authors
American Review of Public Administration	28 (1998) 1	Bajjaly, S.T.
Behaviour & Information Technology	19 (2000) 4	Teo, T.S. H., and Ang, J. S. K.
Decision Sciences	22 (1991) 5	Das, S.R., Zahra, S.A., and Warkentin, M.E.
European Journal of Information Systems	10 (2001) 1	Duhan, S., Levy, M., and Powell, P.
European Journal of Information Systems	8 (1999) 2	Gottschalk, P.
European Journal of Information Systems	9 (2000) 3	Tai, L.A., and Phelps, R.
European Journal of Information Systems	3 (1994) 3	Flynn, D.J., and Hepburn, P.A.
European Journal of Information Systems	1 (1991) 1	Galliers, R.D.
Harvard Business Review	83 (2005) 10	Nolan, R., and McFarlan, F. W.
IBM Systems Journal	38 (1999) 2	Henderson, J.C., and Venkatraman, N.
INFOR	30 (1992) 4	Conrath, D.W., Ang, J..K., and Mattay, S. J.
Information & Management	36 (1999) 2	Gottschalk, P.
Information & Management	20 (1991) 1	Wilkes, R.B.
Information & Management	35 (1999) 5	Wexelblat, R. L., Srinivasan, N.
Information Systems Journal	4 (1994) 1	Reponen, T.
Information Systems Research	8 (1997) 2	Chan, Y.E., Huff, S.L., Donald W., and Copeland, D.G.
Int. Journal of Information Management	9 (1989) 4	Wilson, T.D.
Int. Journal of Information Management	14 (1994) 3	Codington, S., and Wilson, T.D.
Int. Journal of Information Management	16 (1991) 4	Allen, D.K., Wilson, T.D.
Int. Journal of Information Management	17 (1997) 1	Abdul-Gader, A.H.
Int. Review of Law, Computers & Technology	12 (1998) 1	Hoey, A.
Journal of Information Technology	3 (1988) 1	Sutherland, E., and Morieux, Y.
Journal of Information Technology	5 (1990) 3	Angell, I. O.
Journal of Information Technology	6 (1991) 2	Bacon, N.
Journal of Management Information Systems	2 (1985) 3	Venkatraman, N.
Journal of Management Information Systems	8 (1991) 2	Mason, R. M.
Long Range Planning	32 (1999) 3	Gottschalk, P.
Long Range Planning	30 (1997) 2	Hatten, M.L., Hatten, K.J.
Long Range Planning	20 (1987) 2	Hayward, R.G.
Long Range Planning	20 (1987) 3	Ward, J.M.
Management Science	24 (1978) 15	Ein-Dor, P., and Segev, E.
MIS Quarterly	2 (1978) 1	King, W.R.
MIS Quarterly	7 (1983) 2	Pyburn, P. J.
Sloan Management Review	23 (1982) 3	Lucas, H.C., and Turner, J.A.

Sloan Management Review	33 (1992) 2	Adler, S., McDonald, D., and William; M. F.
Technology Analysis & Strategic Management	7 (1995) 4	Brady, T., and Targett, D.
The Journal of Strategic Information Systems	10 (2001) 3	Hidding, G.J.
The Journal of Strategic Information Systems	3 (1994) 2	Atkins, M.H.
The Journal of Strategic Information Systems	6 (1997) 4	Chan, Y.E., Huff, S. L., and Copeland, D.G.
The Journal of Strategic Information Systems	1 (1992) 3	Holland, C., and Lockett, G.
The Journal of Strategic Information Systems	1 (1992) 4	Chan, Y.E., and Huff, S.L.
The Journal of Strategic Information Systems	13 (2004) 2	Peppard J. and Ward J.
The Journal of Strategic Information Systems	10 (2001) 4	Ragu-Nathan, B., Ragu-Nathan, T.S., Tu, Q., and Shi, Z.
The Journal of Strategic Information Systems	6 (1997) 2	Smits, M.T., van der Poel, K. G., and Ribbers, P. M. A.
The Journal of Strategic Information Systems	5 (1996) 3	Lederer, A.L., and Salmela, H.
The Journal of Strategic Information Systems	5 (1996) 2	Smits, M. T., and van der Poel, K.G.
The Journal of Strategic Information Systems	1 (1992) 4	Brady, T., Cameron, R., Targett, D., and Beaumont, C.
The Journal of Strategic Information Systems	10 (2001) 1	Kanungo, S., Sadavarti, S., and Srinivas, Y.

Table 17: List of articles on IT strategy concepts and concerns

The literature on IT strategy content has tried to overcome the ambiguity of the IT strategy concept in two ways. The first way is to set up lists of topics to be included in an IT strategy. Such issue lists cover heterogeneous issues ranging from facilities and hardware plans to the application portfolio and strategic information systems to information resources and finally to financial plans for IT (Table 18). Issues lists are typically identified either through literature reviews (e.g., Das, Zahra and Warkentin 1991; Flynn and Goleniewska 1993, pp. 297), through surveys among planners (e.g., Conrath, Ang and Mattay 1992), or by building on experience of planning experts, consultants and tool designers (e.g., Lederer and Salmela 1996, Wexelblat and Srinivasan 1999).

Ref.	Proposed content	Evidence
Pyburn, 1983	A general hardware and software architecture A technology assessment program to identify new opportunities made feasible by new technology A prioritization and evaluation methodology to allocate scarce development resources to the highest payoff areas An agreed upon relationship between business strategy and IS strategy to ensure that systems requirements that are most critical to the success of the firm are met	Presented as summary of participating managers statements
Das, Zahra et al., 1991	Distinctive competence emphasized in strategic MIS planning (cost of information, information differentiation for different applications, specialized information for specific market niches) Dominant information processing technology Level of computerization of the MIS function Sources from which the firm obtains its IS technology Contribution of MIS department to systems design and development Medium, by which MIS contributes Technical processes through which MIS are managed and controlled Organizational structure of the MIS unit Administrative policies used to motivate and manage employees in MIS department	Derived from literature review including overall IS plans (not necessarily strategic)
Conrath, Ang, et al., 1992	Statement of objectives for the MIS function, Hardware plan Projection of the future MIS technology Recommended implementation plan Systems development plan including potential project descriptions with associated priority rankings Financial, Personnel and Facilities plan Projection of possible future user environment Organization and Education plan Projection of possible future industry environment Summary of strengths and weaknesses of staff Comparison of past IS performance vs. plan Alternate strategies	With reference to McLean and Soden (1977). The items get ranked empirically through a survey. McLean and Soden (1977) collect the issues on the list normatively and have them ranked through a survey.
Reponen, 1994	External opportunities for using IT as a competitive weapon Internal opportunities for supporting competitiveness by means of IT Other application areas of IT Organizing the IM function Rough architecture of IT Estimation of the IT capacity needs Estimation of the benefits of strategy realization	Normative proposal

Lederer and Salmela, 1996	Summary of organisation's IT strategy Data and application plan (initial data entities, high-level specification of apps, requirements for data management, security and training, tools for system development and maintenance, cost, benefits, risks, and resource requirements resulting from the plan) Change management plan: actions that will facilitate adoption of IS plan HR plan: newly required IS skills, new roles/ responsibilities Technical architecture of hardware, supporting databases and system software Migration plan: overall approach, key projects, their order of implementation with cost, benefits, risks of each project Process description: annually updating the plan	The list is provided with a reference to Lederer and Gardiner (1992). Their list relies on a planning method used by a consulting company (Method/1)
Wexelblat and Srinivasan, 1999	Foundational definitions for the organization's computing, networking, and telecommunications: policies, practices, methods, initiatives, operational and maintenance concepts, guidelines, and so forth Proposals or even decisions on retiring older systems. Guidance on what shall be done internally, what by contract and what does not need to be done at all	Normative proposal; partially based on one case
Tai and Phelps, 2000	Three dimensions: IT vision: the main organizational impact that IT systems are intended to have / role of IT (automate, informate up and down, transform) Technological IT issues: choice and management of HW, SW, networks, data systems IT support for knowledge management: ability to store and retrieve information relevant to tasks and decision processes	Referencing Pervan (1998) where a ranked list of CEO's IT issues is provided

Table 18: Articles organising IT strategy as an issue list

The other way to delineate the content of IT strategies has been to develop structured models of IT strategy content (Table 19). In contrast to enumerative lists, IT strategy models (e.g., Earl 1989, Henderson and Venkatraman 1993, Peppard 1999, Ward and Peppard 2002, p. 41 et sqq., McNurlin and Sprague 2006, p. 134 et sqq.) represent comprehensible domains to be addressed by IT strategy, thus suggesting a structure that might be followed in strategy documents. The reasoning behind these models is often based on simple common sense (third column in Table 19). It is striking that the proposals (see Earl, 1989; Earl, 1996; Earl, 2000) most widely received in academic circles (see Brady et al., 1992; Flynn and Hepburn, 1994; Galliers, 1993 and 2004), are normative rather than based on empirical findings (Allen and Wilson 1996). This is not denied by their authors. Earl, for example, admits that many parts of his proposal are still "conjectural" (Earl, 1996, p. 491). In line with this, research by Brady et al. (1992, p. 187) "reveals that delineating between the three [domains of the Earl model] is infrequently done by organizations".

Ref.	IT strategy model components	Underlying reasoning
Lucas and Turner, 1982	Selection of application areas/types of apps Operations needs Implications for staff and equipment Structure of IS function (central vs. decentralised) Charging	Sequential structure (processual)
Hayward, 1987	Strategic Requirements Plan: organizational objectives and strategies, IS mission related to business strategies; assessment of environment, IS policies, objectives & strategies (use CSF or MIS strategy set, Nolan assessment) Management Strategy: policies, objectives and strategies for management of the IS function (Reporting & Control structure; degree of decentralization; standards, security, education) Application strategy: (Information requirement of the enterprise, resource/priority allocation, project planning) Information architecture Technology strategy: (Data Strategy, Communications Strategy, Distribution Strategy, SW Strategy, Supplier)	Applications are argued to be mainly inward oriented while technology is argued to be mainly outward oriented, i.e. dependent on the IT market. No logic provided for separating the other two sub-domains.
Galliers, 1991	Claims to extend (Earl 1989) Information strategy: required information to support business strategy formulation and business processes Information management strategy Information technology strategy Change management strategy Human resource (IS-related) strategy	Change management and HR strategy are added because information systems (we would have to talk about the IS domain here to be in line with Gallier's terminology) are socio-technical systems. Hence, human aspects are as important as the technological aspects.
Brady, Cameron et al., 1992	"triangle model" (Earl 1989) with the strategy domains "IS", "IT", and "IM"	Builds on Earl (1989)
Flynn and Hepburn, 1994	Business IS Strategy: IS strategy/policies (standards for data sharing); application portfolio; information architecture IT strategy: Information resource management (definitions of central IT unit role); management issues; technical means IS/IT management strategy: IS/IT organization (IT sub-unit committee created); investment policies; IS accounting	Builds on Earl (1989)

Smits, Poel et al., 1997 Smits and van der Poel, 1996	Scope: "types of IT covered" Objectives: "targets set for the information function, and the linkages between these targets and the business objectives" Architectures: "applications, […] hardware elements that support the [applications …] in the form of an infrastructure [… and] the distribution of tasks and responsibilities for IT and IS" Rules: "guidelines and standards (or policies) […] such as a hurdle rate for investments [or] rules concerning make-or-buy decisions" Plans: "normally limited to priorities and budgets and do not include detailed designed and project plans"	Cite (Earl 1989), but use "scope, objectives, architectures, rules and plans" The authors themselves do not provide reasoning; Earl(1989) provides a different structure (see below)
Henderson and Venkatraman, 1999	How the firm is positioned in the I/T marketplace (external) IT scope: technologies (e.g. LAN/WAN) that support current/shape new business strategy initiatives Systemic competences: attributes of I/T strategy (system reliability, flexibility, interconnectivity) can contribute positively to/shape business strategy I/T governance: mechanisms for obtaining the I/T competencies How the I/S infrastructure should be deployed (internal) I/S architecture: choices defining the app portfolio, configuration of HW/SW, communication, data I/S processes: work processes central to the ops of I/S infrastructure I/S skills: choices regarding the acquisition, training of the knowledge required to manage and operate I/S infrastructure	Analogy to business strategy: business strategy is claimed to consist of scope, competences and governance. Hence, and IT strategy should be built in compliance with this structure. .

Table 19: Articles proposing or assessing IT strategy models

Working Papers, ERCIS

No. 1 Becker, J.; Backhaus, K.; Grob, H. L.; Hoeren, T.; Klein, S.; Kuchen, H.; Müller-Funk, U.; Thonemann, U. W.; Vossen, G.: European Research Center for Information Systems (ERCIS). Gründungsveranstaltung, Münster, 12. Oktober 2004. Oktober 2004.

No. 2 Teubner, R. A.: The IT21 Checkup for IT Fitness: Experiences and Empirical Evidence from 4 Years of Evaluation Practice. March 2005.

No. 3 Teubner, R. A.; Mocker, M.: Strategic Information Planning – Insights from an Action Research Project in the Financial Services Industry. June 2005.

No. 4 Vossen, G.; Hagemann, S.: From Version 1.0 to Version 2.0: A Brief History Of the Web. January 2007.

Nr. 5 Hagemann, S.; Letz, C.; Vossen, G.: Web Service Discovery – Reality Check 2.0. July 2007.

Nr. 6 Teubner, R. A., Mocker, M.: A Literature Overview on Strategic Information Systems Planning. December 2008.

Nr. 7 Ciechanowicz, P.; Poldner, M.; Kuchen, H.: The Münster Skeleton Library Muesli – A Comprehensive Overview. January 2009.

Nr. 8 Hagemann, S.; Vossen G.: Web-Wide Application Customization: The Case of Mashups. April 2010.

Nr. 9 Majchrzak, T. A.; Jakubiec, A.; Lablans, M.; Ückert, F.: Evaluating Mobile Ambient Assisted Living Devices and Web 2.0 Technology for a Better Social Integration. January 2011.

Nr. 10 Majchrzak, T. A.; Kuchen, H.: Muggl: The Muenster Generator of Glass-box Test Cases. February 2011.

Nr. 11 Becker, J.; Beverungen, D.; Delfmann, P.; Räckers, M.: Network e-Volution. November 2011.

Nr. 12 Teubner, R. A.; Pellengahr, A. R.; Mocker, M.: The IT Strategy Divide: Professional Practice and Academic Debate. February 2012.

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