DEFINING THE CONTENT OF INFORMATION STRATEGY:

LINKING THEORY AND PRACTICE

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Ich versichere an Eides statt, dass ich die eingereichte Dissertation “Defining the Content of Information Strategy: Linking Theory and Practice” selbständig verfasst habe. Anderer als der von mir angegebenen Quellen und Hilfsmittel habe ich mich nicht bedient. Alle wörtlich oder sinngemäß den Schriften anderer Autoren entnommenen Stellen habe ich kenntlich gemacht.

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LIST OF ABBREVIATIONS

BPR	Business Process Reengineering
CEO	Chief Executive Officer
CIO	Chief Information Officer
DCV	Dynamic Capabilities View
EUR	Euro
HR	Human Resources
IM	Information Management
IP	Information Processing
IS	Information System
IT	Information Technology
ITIL	IT Infrastructure Library
MBV	Market Based View
PRINCE2	Projects in Controlled Environments Version 2
R&D	Research and Development
RBV	Resource Based View
RDT	Resource Dependency Theory
RFID	Radio Frequency Identification
RUP	Rational Unified Process
SIP	Strategic Information Planning
SIS	Strategic Information System
SOA	Service-Oriented Architecture
UML	Unified Modeling Language

N.B.: Following the guidelines for "consumable research" (Robey and Markus 1998), the first person plural is used throughout this document.

1 INTRODUCTION AND MOTIVATION

Today, information technology (IT) permeates organizations: it supports key business processes and even forms part of many organizations' products. Without IT, many companies would not exist. Accounting for expenses of up to 10% of revenues, IT is a significant cost factor, too. However, beyond its criticality in operational processes and representing a cost burden, also IT's strategic role is recognized among companies according to numerous press reports. For example, even after the dot-com bubble burst, companies like Wal-Mart, Metro, and Procter & Gamble invest huge amounts of money to explore the impact of Radio-Frequency Identification (RFID) technology, with the intention of fundamentally changing the integration of supply-chains as well as the whole shopping process (Birchall 2007; Blau 2006). In the so-called Web 2.0 era, we find companies like Toyota and Adidas experimenting with Second-Life, the Internet-based virtual community platform, scrutinizing it as a potential new distribution channel (Harkin 2006). At the same time, HMV, the book and music retailer, is feeling the competitive pressure of online rivals who are selling music through digital channels (Braithwaite 2007). In addition, IT vendors do not cease to sell new concepts such as Service-Oriented Architecture (SOA) as the "new silver bullet" for increasing business flexibility while reducing IT complexity (Cane 2007). The list of recent news items on potentially strategic impacts of information technology could be extended much further. Management consulting companies, including such firms as McKinsey & Company, The Boston Consulting Group or A.T. Kearney, react to these strategic IT challenges by founding or strengthening practices dedicated to giving advice on strategic IT planning (Prehl 2005). This 'renaissance' is documented in recent publications on strategic IT planning by consultants (Buchta et al. 2004; Craig and Tinaikar 2006).

In fact, – and despite assertions that "IT doesn't matter [strategically]" (Carr 2003) – the strategic planning of IT is what it has been for many years: a top concern to managers. It has sustained its position beyond any technological hype so far. In brief, strategic IT planning (SIP) remains a "key issue" in practice.

Academics have researched strategic IT planning for more than 20 years now and continue to do so. Their efforts have dwelled on the strategic IT planning process (how to conduct strategic IT planning?) as well as on selected strategic impacts of IT, especially competitive advantage (how can IT contribute to these impacts?). They have dedicated much less energy to information strategy itself. Information strategy is the output of the strategic IT planning proc-

ess; its implementation is intended to create strategic impacts. Hence, it links the process and the impacts.

There is surprisingly little consensus on what information strategy is and what its constituting elements are (its content). In other words, we have limited insights on information strategy. A plethora of related terms is used and the information strategy construct is found in central frameworks such as the "Strategic Alignment Model" (Henderson and Venkatraman 1993). However, the diverse extant proposals for the content elements of information strategy – strategic IT decisions – often lack grounding in practice. In addition, although they might be intuitively appealing, they fall short of convincing reasoning. What is needed is a proposal for information strategy that is both reasoned and practically relevant.

A number of challenges arise from this deficit. First, the lack of clarity regarding the information strategy concept and content casts doubt on research results on the process; at least it hampers further research in this field. Second, missing out on an overall understanding of the concept hampers the development of theories that make use of information strategy. Research works on SIP today are difficult to compare and readers of these works have to reconstruct the meaning laboriously. Third, with a view towards the prominence of information strategy in practice, the current state of research is likely to hamper the transition of findings into practice. The result is an increased gap between research and practice. In order to avoid or counter such a gap, a better understanding of the information strategy seems warranted.

This thesis addresses the deficit by making a practically relevant and theoretically reasoned proposal for information strategy content. It does so by reconstructing the content of information strategy from literature and by eliciting information strategy content from practice. The results from literature are filtered according to their relevance in practice and the results from practice are filtered according to theoretical backing. On this basis, the thesis proposes reasoned content elements of information strategy (strategic IT decisions). The result of the thesis may be used by further research e.g. when operationalizing an information strategy construct in terms of a measurement instrument so that it can be used in theories on information strategy. Practitioners may find the result helpful for cautiously using it as checklist for building new or examining existing information strategies.

1.1 Strategy and Information Strategy

For the purpose of this thesis, it is certainly helpful to clarify what is meant by "strategy". To this end, we briefly refer to the nature of strategy in management studies, which serves as a basis for our understanding of information strategy.

1.1.1 Strategy in management studies

Questions such as 'What is strategy?' (e.g. Mintzberg 1987; Porter 1996; Whittington 2000) or 'What constitutes a strategy?' (e.g. Fahey and Christensen 1986; Hambrick and Fredrickson 2001) are actively discussed in strategic management literature. Researchers still criticize the lack of clarity surrounding the strategy concept and its content in this field of research. For example, Hambrick and Fredrickson (2001) bemoan that "We now have five-forces analysis, core competencies, hypercompetition, the resource-based view of the firm, value chains, and a host of other […] analysis tools. Missing, however, has been any guidance as to what the product of these tools should be – or what actually constitutes a strategy." Markides (1999, p. 6) also cites the dilemma that "despite the obvious importance of strategy and despite decades of academic research on the subject, there is surprisingly little agreement on what a strategy really is […]."

However, there are active discussions on these fundamental issues. Attempts to find answers to the questions "What differentiates strategic decisions from non-strategic ones?"[1] or "What are the characteristics of strategic decisions?" have been made since the advent of the strategy concept (e.g. Ansoff 1965) and are ongoing (Grant 2005). In the same vein, Hickson et al. (1990, pp. 27) pose the question "What makes strategic decisions strategic?" They answer it by stating that "a strategic decision is one in which those who are involved *believe* will play a bigger rather than a smaller part in shaping what happens for a long while afterwards" (emphasis added). Other authors have proposed additional characteristics of strategic decisions, including their expected impact on long-term firm performance, their irreversibility, their directional nature, which provides guidance vis-à-vis lesser decisions as well as their corporate-wide impact (Ackoff 1970, pp. 5; Ansoff 1965, pp.3, pp.9; Grant 2005, pp.14; Hickson et al. 1990, pp.27; Johnson et al. 2005, pp.6; Wheelen and Hunger 2006, p.20).

Other works relate strategy directly to organizational hierarchy. They give a number of examples for strategic decisions at the corporate, business unit, and functional levels. For example, on the corporate level, finding an answer to the question "What businesses should the corporation be in?" (Porter 1987, p.43) as well as determining the level of synergies between these businesses are seen as major concerns (Bowman and Helfat 2001, p. 1; Collis and Montgomery 1999, p. 1; Grant 2005, pp. 22; Hofer and Schendel 1978; Vancil and Lorange 1975). The central strategic decision on the business unit level is how to succeed in product-market seg-

[1] Different authors assign different names to non-strategic decisions. Johnson et al. (2005) distinguish between strategic and operational decisions, Ackoff (1970) between strategic and tactical decisions, and Ansoff (1965) between strategic, administrative, and operational decisions.

ments – especially by gaining a competitive advantage there (Bowman and Helfat 2001, p. 1; Grant 2005, pp. 22; Hofer and Schendel 1978, p. 28). Hence, it is also referred to as competitive strategy (Porter 1987, p. 43). Finally, functional strategy is said to be primarily concerned with the allocation of resources in order to achieve the "maximization of resource productivity" (Hofer and Schendel 1978, p.29; cf. also Wheelen and Hunger 1986).

A major debate has centered on whether such a strategy is construed ex-ante (i.e. through planning) or ex-post (i.e. in an emergent way). In this thesis, we assume the perspective of a deliberate strategy. We acknowledge that certain decisions might not be planned and still have a substantial impact on firm performance. But it does not follow from this that making decisions deliberately is not valuable. On the contrary, total adherence to the emergent view of strategy ultimately leads to an abdication of top management's role and puts the fate of the company into the hands of serendipity and geniuses. As long as we are in short supply of geniuses, we should try to concentrate on what can be influenced deliberately.

1.1.2 Information strategy

Explicit discussions similar to those outlined above for business strategy are rarely found for information strategy. As a result, the information strategy concept is still characterized by a huge degree of obscurity. In the existing proposals, we often find implicit and differing views of information strategy. Hayward (1987, p. 100) noted this early on by stating that "Almost all publications dealing with information systems assume some form of [information] strategy yet rarely is this strategy […] explicitly stated" (Hayward 1987, p. 100). This scenario has not changed significantly since then. The plethora and use of various terms is one indication for this: "The problem of terminology is one of the fundamental issues facing those wishing to develop an information strategy. […] there is a proliferation of terminology and a great deal of ambiguity surrounding its use" (Allen and Wilson 1996, p. 240). Commonly found terms include "strategic information plan" (Lederer and Salmela 1996), "IT strategy" (Gottschalk 1999a), "IS strategy" (Galliers 1991), "IS/IT strategy" (Chan et al. 1998), and "information strategy" (Smits et al. 1997).

We opt for the latter term because the other terms imply a too narrow meaning: information technology encompasses all kinds of devices and equipment that can be used for handling information. This includes hardware (such as computers or printers) and basic software (such as operating systems or database management systems) as well as communication equipment (network cabling, routers, etc.). IT is independent from solving a specific business problem; rather it can be used to solve a range of business problems (Teubner 2003). IT has to be ap-

plied (in the form of an application) to solve a specific business problem or support the user in a specific task. The application together with the users of the application (the human factor) form a socio-technical system, the so called information system (IS) (Teubner 2003). In order to avoid using the acronyms IS/IT, we introduce the term information processing (IP)[2]. Besides IS and IT, the IP concept also includes the activities needed to provide IS and IT within a company (e.g. developing the application system or maintaining hardware components). Together with the people carrying out these activities, they are referred to as the information function (IF) (Teubner 2003). Wherever we use the acronym "IP", we could as well write IS/IT/IF. Hence, neither the term IT strategy, nor IS strategy adequately captures the whole picture. This led us to use the term information strategy as a short form of information processing (IP) strategy. We consider this in-line with the uses of 'information' in terms such as "information management" (Teubner 2003). Hence, the term information strategy is meant to encompass IS and IT strategy rather than to demarcate itself from them.

Based on the understanding of strategy outlined above, we view **information strategy** as a deliberate expression of intentions articulated through an integrated set of directional, difficult to reverse IP decisions that are expected to yield an impact on an organization's long-term performance, i.e. its overall success or failure. The constituent elements of an information strategy – in other words the **content of information strategy** – are strategic IP decisions. The content describes what kinds of decisions should be made as part of an information strategy: "The content describes the subject areas or 'issues' for which the strategy is meant to provide solutions and directions" (Smits et al. 1997, p. 136). Hereby, we adopt the view of other researchers in the business strategy realm who view strategy to consist of intentional decisions or "choices": "Strategy […] is about intentional, informed, and integrated *choices*" (Hambrick and Fredrickson 2001, p. 58; emphasis added), a set of "strategic *choices* […that] have critical influence on the *success or failure of the enterprise*" (Rumelt et al. 1994, p. 9; emphasis added) and that "strategy is not a random collection of […] building blocks but a *carefully constructed* system" of decisions (Collis and Montgomery 1999, p. 3; emphasis added). Rather than following the narrow and formal definition used in decision science, i.e. the selection among a given set of alternatives (e.g. Gäfgen 1974), we broadly refer to a decision as the formation of intentions for future action.

[2] The term 'information processing' should be understood similarly to the German notion of "Informationsverarbeitung"

Our view of information strategy excludes the notion of information strategy as an ex-post-only "pattern in the stream of decisions […] concerned with IT" (cf. e.g. the concept of 'realized IT strategy' found in Chan et al. 1997a; Chan et al. 1997b; Holland and Lockett 1992). Such a pattern is not necessarily intentional. Of course, organizations without an (intentional) information strategy also use IT and hence make decisions regarding IP. However, following our understanding, we cannot infer an information strategy from the mere existence of IP within a company. In addition, simply looking for a pattern in a set of past decisions makes information strategy an arbitrary concept. Furthermore, realized strategies might differ from intentional strategies for pragmatic reasons. (certain intended decisions might not get implemented). As we are interested in those decisions that are intended to influence action, looking at actually performed action alone would not be sufficient.

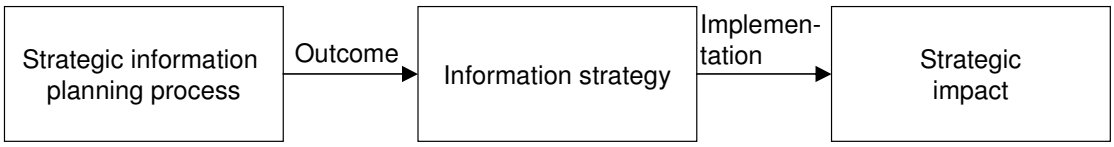


Figure 1: Information strategy put in context

To put information strategy into context, we distinguish it from the process of developing an information strategy as well as from the strategic impacts expected to arise from its implementation. While information strategy and information strategy content describe the "what", the information strategy planning process describes "how such decisions [the content] are reached in an organizational setting" (Fahey and Christensen 1986, p. 168). Following our definition, these decisions are ultimately intended to impact long-term firm performance. Figure 1 depicts the relations between these three distinct concepts.

The remainder of this chapter argues why research related to information strategy content is important (Section 1.2). It also outlines the challenge addressed in the thesis (its objective) and the thesis' contribution to addressing the challenge (Section 1.2.3). The structure of the rest of the document is derived from the approach taken to address the challenge. Both are presented in Section 1.3.

1.2 THE NEED FOR RESEARCH ON INFORMATION STRATEGY

On the first page, we illustrated the relevance of research on information strategy by providing recent real-world examples of companies using IT with a strategic intent and making a number of claims about the state of research on information strategy. The following argu-

ments substantiate these introductory statements and build a basis for formulating the research objectives underlying the research.

1.2.1 Relevance of information strategy in practice

Strategic IP decisions are important issues in practice; in fact, they have been among the top-ranked concerns of managers for many years now (e.g. Luftman 2005; Luftman et al. 2006; McGee et al. 2005; Watson et al. 1997). Looking at the surveys conducted regularly among IT executives since the early 1980s, we see that SIP has always been among the top issues (see Figure 2; based on (Ball and Harris 1982; Brancheau et al. 1996; Brancheau and Wetherbe 1987; Dickson et al. 1984; Hartog and Herbert 1986; Luftman 2005; Luftman et al. 2006; Luftman and McLean 2003; Niederman et al. 1991)).

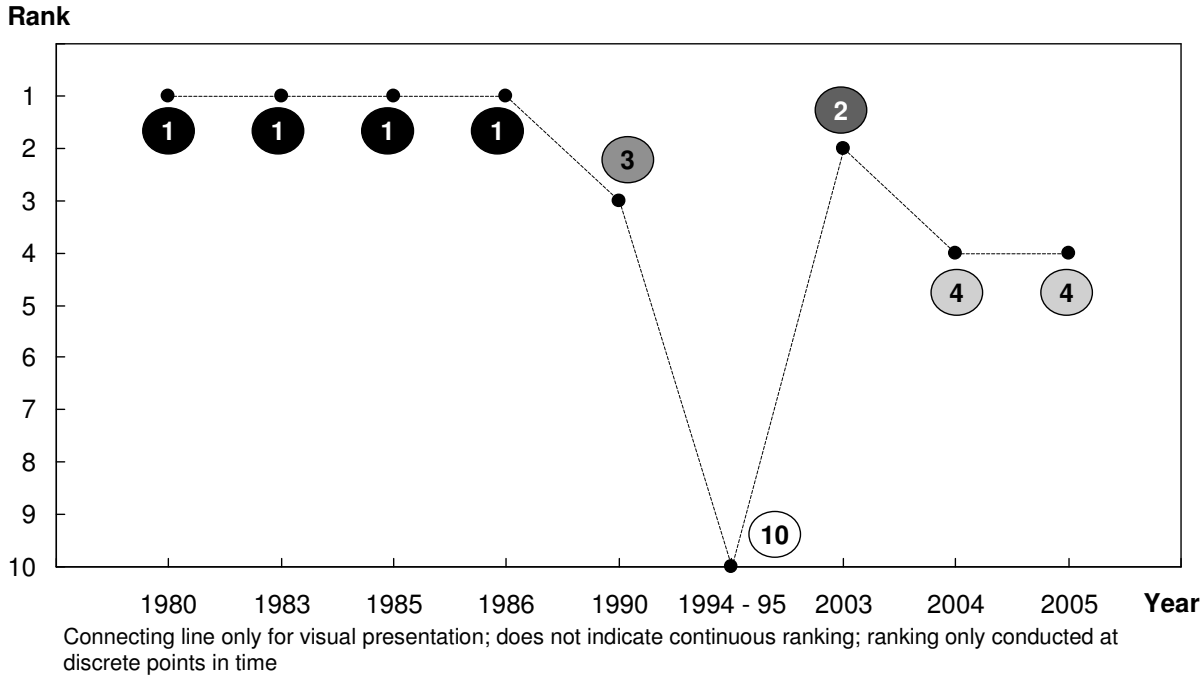


Figure 2: Rank of SIP among key issues of IT executives by year

Even in the one instance where SIP had dropped to the tenth most important issue, the authors of the study state that "interviews suggest that its drop in rank may be due more to the current focus on implementation and execution rather than to having 'solved' the problems relating to this issue [SIP]" (Brancheau et al. 1996, p. 233)

Another indication of the importance of SIP is the existence of columns in practitioner magazines as well as of practitioner conferences dedicated to SIP (e.g. the column "IT Strategien" in Computerwoche, a weekly German computer magazine, or "Strategisches IT-Management", an annual conference hosted by Handelsblatt, a German daily business newspaper). Finally, it is not unusual to find position titles such as "Head of IT Strategy" in prac-

tice (e.g. Heinz Kreuzer, Head of IT strategy/CIO of Preussag AG (TUI-website 2001), Jeff Temple-Heald, Divisional Director IT Strategy of United Insurance Brokers Ltd (UIB-website 2005), Mike Hampson, Global Head of IT Strategy, Projects and Development at ABN Amro (Edginton 2001, p. 4), Thomas Becker, "Leiter IT Strategie" of German broadcasting company ZDF (ZDF-website 2005), Bob Fuller, former Director of IT Strategy at Dresdner Kleinwort (Equiduct-website 2007)).

There are also good reasons for practitioners' interest in SIP, especially in information strategy and its content. Several authors[3] argue that it is critical to have an understanding of which decisions are strategic and hence should be included in a strategy. For example, (Cash Jr et al. 1992, p. 626) emphasize the difference in the "amount of senior management thinking to be devoted" to strategic issues vs. to non-strategic issues. They claim that strategic issues require more attention than non-strategic issues. In addition, Ansoff (1965, pp. 9) argues that strategic decisions are "not self regenerative." This means that they do not automatically occur on the management's agenda: "Unless actively pursued, they may remain hidden behind operations problems." From this, Ansoff concludes that "Since strategic problems are harder to pinpoint, they require special attention." One argument supporting this is given by Angell (1990, p. 171). He states that strategic decisions have an "influence that has a lasting effect on the disposition of a system." Accordingly, the failure to recognize a strategic decision may result in locking the "business system" into long-lasting if not irreversible problems. Consequently, managers might want to think more carefully about – i.e. pay more attention to – strategic issues. Hambrick and Fredrickson (2001, p. 49) and similarly Kay (1998) note that "Strategy has become a catchall term used to mean whatever one wants it to mean." However, "When executives call everything strategy [...] they create confusion and undermine their own credibility."

The question for information strategy then is: what are these strategic IP decisions, i.e. what is the content of information strategy? The next section looks at the state of answers to this question proposed by research to date.

1.2.2 State of information strategy research

Perhaps due to the importance of SIP in practice, several research efforts have been devoted to its study. However, compared to business strategy discussions outlined in section 1.1.1, there is almost no academic investigation of information strategy itself, especially not on its

[3] We partially rely on general strategy discussions here.

content. Alluding to the concepts introduced in Figure 1, most articles focus on the process of developing an information strategy or the strategic IP impact. In a study of 137 research articles published between 1991 and 2004, Brown (2004) found that only 26% of the articles concerned the content. In contrast, 84% of the articles addressed the process of formation and 48% concerned the impact[4] (see Figure 3). For example, three recent MIS Quarterly review articles (which are meant to conduct comprehensive reviews of extant literature) looked at the relationship between IT and competitive advantage as only one instance of strategic impact (Melville et al. 2004; Piccoli and Ives 2005; Wade and Hulland 2004). 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 plan."

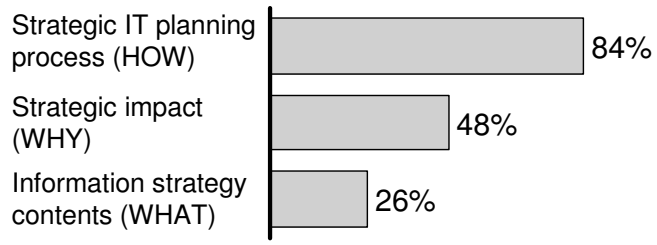


Figure 3: Topics of SIP articles published between 1991-2004 in academic journals

As a result, there are few proposals on what an information strategy should contain. The existing ones are characterized by a lack of consensus on basic terminology and concepts (see Section 1.1.2). Besides providing diffuse views on information strategy, the existing proposals are rarely based on sound reasoning. Furthermore, few of them are based on empirical findings but rather on the authors' own understanding. This might explain why practitioners seem to be dealing with different strategic IP decisions as part of their information strategies than researchers. Practitioners responsible for developing an information strategy – one of the responsibilities of CIOs according to (Stephens et al. 1992) – must find it very difficult to obtain guidance from research in this respect. In fact, an analysis of the topics discussed under the label of information strategy (the term "IT strategy" seems to be more common in practice) at practitioner conferences and in magazines reveals a gulf between research and practice. The most frequent "IT strategy" topics in Computerwoche in 2005 included technology standards (37 articles), IT cost reduction (16 articles), IT security issues (9 articles), and IT provider management (11 articles). None of those topics has regularly been ascribed as having strategic

[4] Several articles were classified as covering process, content and impact at the same time; hence, the percentages add up to more than 100%.

relevance so far in research (cf. Doherty and Fulford 2006 on the neglect of strategic security issues in research). This fact is confirmed by earlier research reporting "differences within and between organizations, but particularly in comparison to the academic literature" with regard to "strategic IT issues" (Brady et al. 1992, p. 183).

1.2.3 Research desiderata and objective of the thesis

When we combine the messages from the previous sections, we see a discrepancy between the level of understanding of information strategy in research and its relevance in practice. Improving this state of research is desirable for both research and practice.

For research, the lack of clarity on the information strategy compromises the research on the process and the strategic IP impact: as long as there is no proper reflection on information strategy and its content, the discussion on the process and the impact necessarily remains vague. In support of this, Maritan and Schendel pose the question in the domain of business strategy "How can we really understand the process of making strategic decisions without explicitly considering the strategy content of the decisions and how it links to outcome?" (Maritan and Schendel 1997, p. 262). Hambrick and Fredrickson (2001) allude to the danger of "narrow, piecemeal conceptions of strategy" inherent in the approach of simply following a certain process without understanding the strategy content itself. Thus, an analysis of the process should be preceded by a substantiation of the (expected) output, i.e. the content. In addition, the content of information strategy (i.e. strategic IP decisions) may drive the research agenda similarly to the research agenda on business strategy: the assumption that decisions on business scope have a strategic impact has fueled research on diversification and industry attractiveness. The assumption that differentiation from competitors within an industry is strategically beneficial drove the development of theories of competitive advantage (Bourgeois 1980).

As long as we do not have a clearer understanding of the information strategy itself, building theories using information strategy (whether they have information strategy as a dependent or independent variable) will necessarily remain few and vague. This shortcoming is analogous to earlier state of business strategy research that have argued that the lack of "uniform treatment of the concept [of strategy …] has hindered theoretical and empirical development of the concept" (Bourgeois 1980, p. 27)

And unless this information strategy understanding in research is practically relevant, there will be little advancement of the practice of SIP through research. In conclusion: working on information strategy and its content is key to advance the understanding in one of the prime

areas of concern for practitioners. Thus, practitioners would benefit from a better understanding of information strategy, too. A better understanding of information strategy will hopefully lead to more and more relevant theories on information strategy. Understanding and applying these theories would help practitioners to eventually develop more appropriate information strategies.

Consequently, the thesis' objective is to improve the understanding of information strategy with a special focus on its content (what are the strategic IP decisions). As outlined above, this should contribute to research as well as to practice. The contribution will take the form of reasoned and practically relevant proposals for strategic IP decisions, i.e. for the information strategy content. Practitioners might use the proposal as a tool for examining their information strategy agendas. Managers responsible for information strategy can use this work to ask themselves whether they have good reasons to not include the proposed elements of information strategy within their own strategy or why they potentially pay attention to others not included in the proposal. These objectives conform to those of Information Systems research as expressed by the "Wissenschaftliche Kommission Wirtschaftsinformatik", namely to add to the understanding of research as well as to provide support to the practitioner (König 1994).

The objective of this research is to make a reasoned and relevant proposal for the content of information strategy. This proposal shall be based on current academic discussion, but shall also be practically relevant. Hence, we want the proposal to be theoretically reasoned but also practically relevant. We have defined the content elements of information strategy as strategic IP decisions. Hence, the thesis answers the questions "which IP decisions can be argued to form the content of information strategy?" This involves to identify the IP decisions as well as to give reasons for why they form part of information strategy. These reasons should not only be theoretically backed, but also practically relevant.

1.3 Conduct of Research and Structure of the Thesis

The principal approach to achieve the research objective involves four steps (see Figure 4): in a first step (Chapter 2), we take the academic perspective; we seek to identify the content elements of information strategy from the academic literature on information strategy. This entails reviewing the literature for proposals of information strategy content and ascertaining the reasoning behind the proposals. As stated above, we cannot expect academic literature to be fully satisfactory in this respect. Furthermore, also with a view towards the aforementioned disconnect between research and practice, we argued for grounding our proposal in practice, as well. Consequently, the study is not based solely on research literature but also entails a

practitioner perspective[5]: in a second step (Chapter 3), we conduct a practical empirical investigation. Here, we look at the content and reasoning of information strategy in practice. Looking at information strategy content from this angle should help us to come to a more practically valid proposal for information strategy content. Both steps provide independent sets of content elements for information strategy. In a third step (Chapter 4), we analyze the two sets: for academic proposals, we have to check their practical relevance; for content argued to be part of information strategy in practice, we have to check their theoretical backing. Finally, we integrate the practically relevant proposals for the content of information strategy from research with the theoretically reasoned proposals from practice (Chapter 5).

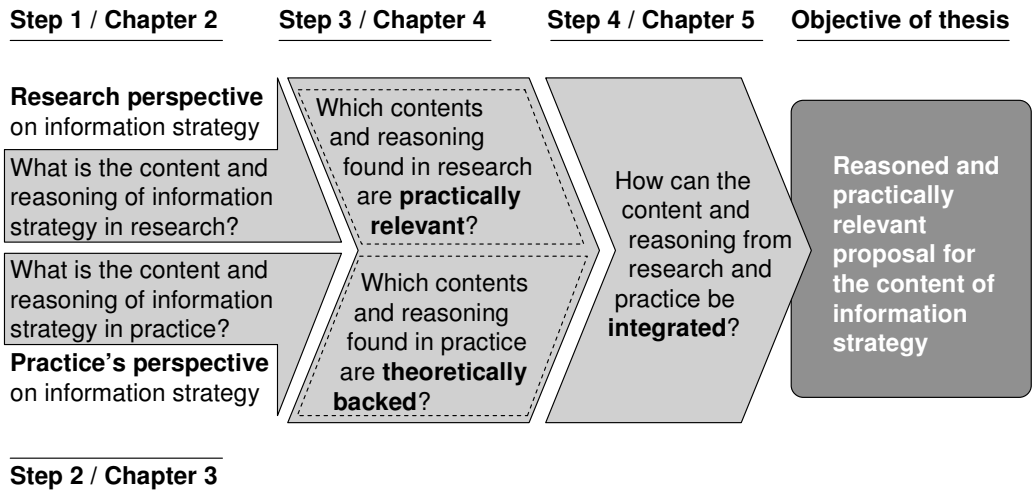


Figure 4: Research approach and structure of the thesis

[5] The fact that the need for strategic thinking in the field of business was first articulated by top executives (i.e. practitioners) such as Alfred Sloan of GM, Chester Barnard of AT&T or Peter Drucker of GM (cf. Ghemawat 1997, p. 2), might serve as another argument for looking into practice to obtain insights into information strategy.

2 RESEARCH PERSPECTIVE ON INFORMATION STRATEGY

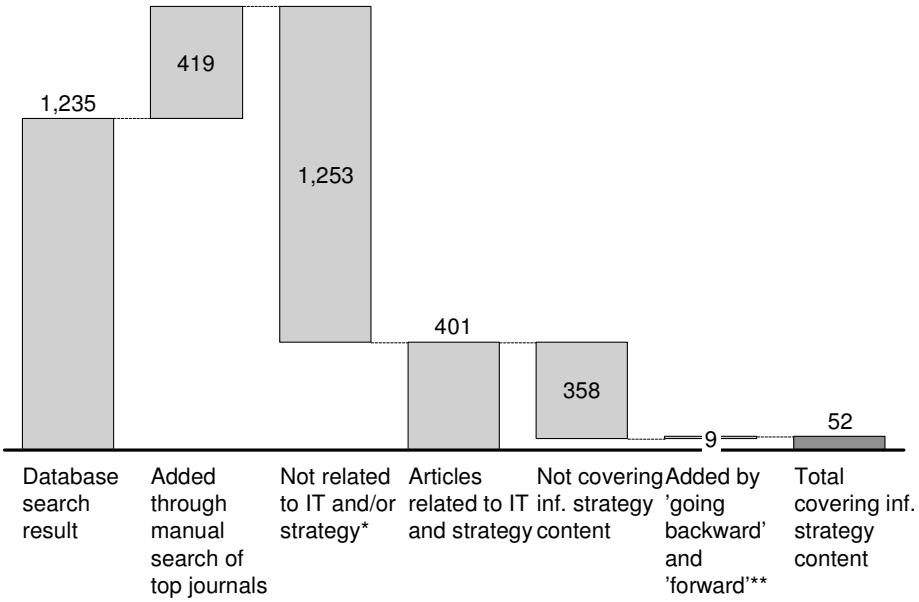
The aim of the first step of the study is to identify the elements of the content of information strategy from the academic research literature on information strategy. Synthesizing the current state is important for two reasons: first, the deficits in the existing literature are a major impetus for this work. The claims made in the previous chapter regarding the lack of clarity on information strategy require substantiation. Second, prior works on information strategy might contain some valid proposals and should therefore not be disregarded out of hand.

Answering the question "What is the content of information strategy proposed in research" entails a search for proposals as to which IP-related decisions ought to be included in an information strategy and why.

The basis for finding answers to these questions in the research literature is a comprehensive literature review. The methodology of this review is presented in the next section, followed by the findings.

2.1 METHOD

The literature review follows the general guidelines for conducting comprehensive literature reviews (Webster and Watson 2002): in summary, we started with a literature database search, but also went through the titles and abstracts of leading relevant IS and business journals manually. We filtered the resulting articles according to their relevance for the research objective. In addition, we "went backward" by looking up the references from selected articles. We also went "forward" by identifying works that referenced the identified articles. In this way, we found 52 articles covering information strategy content. The following paragraphs explain how we arrived at this number in more detail (cf. also Figure 5).



* Includes 984 from the database search result

** In total, 26 articles were identified by 'going backward' and 'going forward', but only 9 were really related to inf. strategy content (of the 26, 3 were not related to IT and/or strategy at all)

Figure 5: Number of articles identified in literature review

We began building our literature base by conducting a keyword search in several literature databases, which provided access to a broad spectrum of international IS and business journals[6] (the leading journals covered are listed according to their ISWorld ranking (AIS 2007) in Table 1. A full list of journals covered in the databases can be found on the corresponding database websites (Ebsco-title-list 2007; Proquest-title-list 2007)). We searched EBSCO/Business Source Complete, Proquest/ABI Inform, and Science Direct for the string "(Info* OR IT OR IS) AND strateg*" in title, abstract, and keywords. This search resulted in 1235 articles.

[6] Since our focus is on the academic discussion, we excluded practitioner magazines, trade journals, etc. from our review. For the most part, we also excluded non-scholarly contributions, such as editorials or book reviews; these were only included if referenced by any of the articles included in the review.

Number	Journal Name	Starting year	Starting volume	Starting issue	Source used
1	MIS Quarterly	1977	1	1	EBSCO
2	Information Systems Research	1990	1	1	EBSCO
3	Communications of the ACM	1965	8[7]	1	EBSCO
4	Management Science	1954	1	1	EBSCO
5	Journal of MIS	1984	1	1	EBSCO
6	Decision Sciences	1970	1	1	EBSCO
7	Harvard Business Review	1922	1	1	EBSCO
8	European Journal of Information Systems	1993	2	1	Proquest
9	Decision Support Systems	1997	19	1	EBSCO
10	Information & Management	1977	1	1	Science Direct

Table 1: International top journals covered by database search (selection)

However, a simple keyword search is a rather imprecise method of scanning the content of documents for relevant contributions. Some relevant articles necessarily slip through the meshes of such a search, while a large number of irrelevant articles surface. In order to address the first shortcoming to some extent, we manually scanned the titles and abstracts of all the volumes (starting in 1970; information strategy has not been discussed earlier) 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 specifically address strategic topics (e.g. publications with "strategy" or "strategic [management]" in their titles, or whose mission statements explicitly cite the subject as a core topic). Table 2 lists the IS and business journals selected for our manual scan, with the corresponding starting year, volume, and issue number as well as the primary field (IS or business). The manual scan added 419 more articles to our literature base, bringing the total to 1654 when added to the 1235 articles from the database search.

[7] We considered starting with volume 8 of this publication appropriate given the fact that this volume is from 1965. We expect hardly any information strategy-related publications prior to 1970.

Journal name	Starting year	Starting volume	Starting issue	Primary field
MIS Quarterly	1977	1	1	IS
Information Systems Research	1990	1	1	IS
Journal of MIS	1984	1	1	IS
Information & Management	1977	1	1	IS
European Journal of Information Systems	1992	1	1	IS
Journal of the Association of Information Systems (AIS)	2000	1	1	IS
Communications of the AIS	1999	1	1	IS
Journal of Strategic Information Systems	1991/92	1	1	IS
Management Science	1970	16	5	Business
Harvard Business Review	1970	48	1	Business
Academy of Management Journal	1970	13	1	Business
Academy of Management Review	1976	1	1	Business
Strategic Management Journal	1980	1	1	Business

Table 2: Journals included in manual search

To counteract the second shortcoming of the database search, the profusion of irrelevant articles, we screened the abstracts of all the articles in our literature base for relevance. This led us to exclude 1253 articles (984 from the database and 269 from the manual search[8]) from the relevant literature base. The excluded articles were either not related to strategy as defined in the working definition (e.g. articles using "strategy" to denote a clever way of doing something (as in pricing strategy, search strategy). or not addressing IP in any way[9] (as e.g. in (Southall et al. 2005)).

Hence, the screening process left us with 401 articles that were somehow related to IP and strategy. As stated in Chapter 1, the focus of the thesis is on information strategy and its content, which is distinct from its development process and impact. Assigning the 401 articles to these categories left us with 43 articles devoted to the content of information strategy[10] (i.e. 358 articles addressed only the process or the impact[11]).

[8] We used a very broad filter in the manual search; we deliberately adopted a policy of including all articles that might somehow be related to IT and strategy in order to avoid the exclusion of any potentially relevant works. As scanning hundreds of articles can become a tedious job, no classification had been done at this point. This explains why in the later screening step, a large number of articles that were previously added through the manual search had to be removed from the literature base again.

[9] A large number of the irrelevant articles can be attributed to the lack of a case-sensitive search function on the EBSCO database. Because "IS" and "IT" were necessarily part of our search string, many articles containing the verb "is" or the word "it" (but irrelevant to our topic) were returned by the search.

[10] An article can cover multiple categories.

[11] In fact, the categories were derived bottom-up (i.e. by multiple rounds of grouping articles with similar research questions/topics) rather than top-down. in addition to the three categories of process, impact, and content,

Upon reading these 43 articles in depth, we discovered nine other works cited in these articles covering the content of information strategy[12], resulting in a total of 52 articles relevant for this study.

2.2 FINDINGS OF THE LITERATURE REVIEW: TERMINOLOGY

Looking at the relevant articles, we find that the concept of information strategy is quite commonly used in research. As stated in the first chapter, a number of different terms are used to refer to similar constructs (Table 3). Upon closer inspection of the terms and their definitions, we observe a lack of clarity with respect to how these constructs differ or relate to each other. We agree with other researchers that the multitude of ambiguous terms must be highly confusing to anyone attempting to interpret the research articles: "The problem of terminology is one of the fundamental issues facing those wishing to develop an information strategy. […] there is a proliferation of terminology and a great deal of ambiguity surrounding its use" (Allen and Wilson 1996, p. 240).

Term used	Definition provided	Source
I/T strategy	None provided	(Henderson and Venkatraman 1999)
Information management strategy	A long-term precept for directing, implementing and supervising information management (Information management left undefined)	(Reponen 1994)
	Deals with management of the entire information systems function Referring to (Earl 1989): "the management framework which guides how the organization should run IS/IT activities"	(Ragu-Nathan et al. 2001)
Information plan	Tangible outputs of the SISP process, namely a portfolio of computer-based applications that will assist an organization in executing its business plans and realizing its business goals	(Brown 2004; Lederer and Salmela 1996)
Information strategy	A complex of implicit or explicit visions, goals, guidelines and plans with respect to the supply and the demand of formal information in an organization, sanctioned by management, intended to support the objectives of the organization in the long run, while being able to adjust to the environment	(Smits et al. 1997; Smits and van der Poel 1996)

the categories implementation and alignment were derived, as well. However, the articles in these categories did not cover the content of information strategy.

[12] Overall, we followed 26 potentially relevant references from the 43 information strategy content-related articles. However, after reviewing these articles, we found that three were not related to information strategy at all and that 14 were related to categories (e.g. process or impact) other than information strategy content.

Information system(s) strategy, IS strategy	A comprehensive plan that includes the following components: IS mission statement, IS objectives, linkage of the IS objectives to organizational goals, IS action plan for achieving IS objectives, assignment of tasks to individuals/units, mechanisms for management control, feedback and reporting	(Bajjaly 1998)
	None provided; defines only "strategic information systems," a term which is used synonymously: "IS used to support or shape an organization's competitive strategy, its plan for gaining and maintaining competitive advantage"	(Chan and Huff 1992)
	None provided	(Galliers 1991), (Hayward 1987), (Hatten and Hatten 1997)
	"lays plans and sets standards"; "a coordinated and integrated approach to the provision and management of systems over the next five years or more"	(Hoey 1998)
	Search for competitive advantage through IS/IT use	(Duhan et al. 2001)
	None provided	(Bacon 1991)
	None provided; used synonymously with IT strategy	(Tai and Phelps 2000)
Information technology strategic plan	None provided	(Wexelblat and Srinivasan 1999)
IS strategic plan	used synonymously with IS strategy (see there)	(Bajjaly 1998)
IT strategy	In a broad sense to incorporate the range of issues associated with strategy formation and implementation with respect to information systems	(Galliers 1993a)
	Written plan comprised of projects for application of information technology to assist an organisation in realising its goals	(Gottschalk 1999a; Gottschalk 1999b; Gottschalk 1999c)
	Using IT to gain competitive advantage	(Brady and Targett 1995b)
	Plan to manage IT strategically	(Knights and Morgan 1995)
	"sustaining competitive advantage using IT"	(Hidding 2001)
	"document containing plans, intentions and policies for the organization's current and future use of IT, and 'softer' IT related issues"	(Brady et al. 1992)
	No explicit definition provided; referring to (Parsons 1983): "general frameworks which guide the opportunities of IT which are identified, the IT resources which are developed, the rate at which new technologies are adopted, the level of impact of IT within the firm"	(Kanungo et al. 2001)
	Citing (Parsons 1983): "central tendencies which firms use to guide IT/IS within the business"	(Ward 1987)
	None provided; used synonymously with IS strategy	(Tai and Phelps 2000)
IT/IS strategy	Ways in which IT/IS is used to deliver a strategy; used indiscriminately with strategic IS;	(Atkins 1994)

	referring to (Wiseman 1985): "information systems used to support or shape the competitive strategy of the organization"	
Long-range IS planning document	Long range/strategic planning [document] […] considers three or more years into the future and involves the development of EDP/MIS objectives and the implementation of strategies and policies to achieve these objectives	(Conrath et al. 1992)
MIS plan	The output of strategic IS planning	(Pyburn 1983)
MIS strategy set	Will guide the design and development of the MIS; as derived from the organizational strategy set	(King 1978)
Strategic information plan	A portfolio of computer-based applications that will assist an organization in executing its business plans and realizing its business goals	(Lederer and Salmela 1996)
Strategic plan for Information systems	Output of the IS planning process	(Teo and Ang 2000)
Strategic plan for MIS	None provided	(Ein-Dor and Segev 1978)
Strategies for information systems	Used synonymously with IT strategy (see there)	(Ward 1987)

Table 3: Terms and definitions for information strategy used in research

2.3 FINDINGS OF THE LITERATURE REVIEW: CONCEPTIONS OF INFORMATION STRATEGY

Following a more in-depth analysis of the articles, we find that despite the popularity of the terminology, the information strategy has mostly been used implicitly rather than serving as the object of thorough research. In fact, no article explicitly addressed the question of what the content of information strategy might be.

18 out of the 52 articles allude to the content of information strategy even more peripherally. They deal with the following topics: eight articles are on the "meta" level, such as reviews of strategic information planning literature (e.g. Brown 2004), or provide instructions for doing research related to IP and strategy (e.g. Chan and Huff 1992; Venkatraman 1986); three articles exclusively discuss characteristics of information strategy content in terms of the implementability of the strategy rather than the content itself (Gottschalk 1999a; Gottschalk 1999b; Gottschalk 1999c); one further article looks at the usefulness of strategic IS plans without broaching their content (Teo and Ang 2000); three articles refer to "realized strategies," a concept we rejected in the first chapter due to the unintentional nature of such strategies (Chan et al. 1998; Chan et al. 1997b; Holland and Lockett 1992); two very early articles consider how to link a single IS to business strategy (Ein-Dor and Segev 1978; King 1978); fi-

nally, one article (Abdul-Gader 1997) uses the term "IT strategy" but does not reference it later on; Orlikowski and Iacono (2001, p. 128) call this "nominal use."

However, even if the articles do not refer to the content and reasoning of information strategy directly, those that actively use any of the terms from Table 3 ought to elaborate their specific understanding or conception of it. A conception of information strategy answers the question "What is an information strategy?" or "How is it understood?" The articles do not provide explicit answers to these questions. We used the term conception also to imply that we had to reconstruct the understanding that was present latently in diverse statements. In contrast to a conception, the content of information strategy refers to the decisions that are part of an information strategy. This is to say that the 34 remaining articles (52 minus 18) were still vague as to what constitutes an information strategy.

From the 34 articles, we identified five different conceptions of information strategy: information strategy as the use of IT to deliver business strategy, as the use of IT to gain competitive advantage, as a plan for the IP domain, as a functional strategy, and as the tenor towards IP.

We arrived at these conceptions inductively by finding statements that allowed us to reconstruct the understanding of information strategy underlying the respective article. Many times, we found these statements e.g. in definitions provided by the author. We will use these statements when describing the conceptions below. They refer to what we call the "anchor" of information strategy and the purpose of information strategy. The *anchor of an information strategy* constitutes the perspective from which the strategy is understood. It is the starting point for strategy-thinking and -making, while the *purpose of an information strategy* describes its end. The purpose raises the questions that must be answered by the strategy. The *content of information strategy* in turn comprises answers to these questions. However, most articles do not explicitly provide insights into information strategy content. Hence, we have to reconstruct them ourselves and call them "implications of the conceptions for the content of information strategy." Table 4 compares the five information strategy conceptions side by side according to these characteristics. We describe the conceptions in more detail below.

Conception: information strategy as...	*… the use of IT to deliver business strategy*	*… the use of IT to gain competitive advantage*	*… a plan for the whole 'IP domain'*	*… a functional strategy*	*… the tenor towards IP*
Anchor	Business strategy	Competitive theory	IP domain	Objectives of information function	Management's attitude or industry requirements
Purpose (question to be answered)	How can the use of IP support overall business objectives/ strategy?	How can the use of IP support gaining and sustaining competitive advantage?	What are the IP elements that have to be planned on a strategic level?	Which resources are needed to fulfill the functional/ departmental objectives?	What is the overall attitude towards IP's role in the organization?
Implications for information strategy content	Decisions on applications and investments in IT/IS that support business strategy	Decisions on IS or IT and other IP resources that support competitiveness	Decisions on/ plans for all kinds of company-wide IP elements (technology, applications, human resources, organizational, financial)	Decisions on/plans for departmental resources only (objectives, mission, staff, budget, etc.)	Choice of role and general attitude towards IP

Table 4: Information strategy conceptions in research

Some articles exhibit characteristics of several conceptions. As none explicitly defined its own conception, such a hodgepodge of conceptions reflects rather internal inconsistencies in the article than a deliberate multi-conceptional perspective.

2.3.1 Information strategy as the use of IT to deliver business strategy

In this conception, information strategy is an integral part (or annotation) of business strategy. A *given business strategy* is seen as the *anchor* for an information strategy. That means that for a given business strategy, the information strategy is supposed to identify "ways in which information technology and systems (IT/IS) may be used to deliver th[is] strateg[y]" (Atkins 1994; cf. Hatten and Hatten 1997) or "how the use of IT can support overall business objectives" (Hoey 1998). This approach implies that information strategy does not exist separately from business strategy but rather is a part of it. It is like assuming an IT-perspective vis-à-vis business strategy. In support of this, Hatten and Hatten (1997) argue that with information strategy, "IS people took their rightful place in [business] strategy discussions" and that information strategy "helps us think about an IS response to business issues," i.e. "find ways to use IS to deal with these issues." (Duhan et al. 2001) insist that "IS/IT […] strategies should be linked directly to the objectives and strategies of the business unit and be considered as part of the overall business planning […]."

Information strategy conception	Information strategy definition	Source
Information strategy as the use of IT to support business strategy/business goals	A portfolio of computer-based applications that will assist an organization in executing its business plans and realizing its business goals	(Lederer and Salmela 1996)
	Written plan comprised of projects for application of information technology to assist an organisation in realising its goals	(Gottschalk 1999a; Gottschalk 1999b; Gottschalk 1999c) (derived from Lederer/Sethi)
	Ways in which IT/IS is used to deliver a strategy; also used indiscriminately: information systems used to support or shape the competitive strategy of the organization	(Atkins 1994)

Table 5: Definitions of information strategy as the use of IT to deliver business strategy

Indications for the content of information strategy can be derived by ascertaining its *purpose*, i.e. by answering the question "*How can the use of IT support overall business objectives/ strategy?*" Companies use IT in the form of applications or, more precisely, information systems (cf. first chapter). Hence, the *content* of information strategy in this conception consists of the choices of *information systems to support the business strategy*. The choice of IS represents an investment decision. Thus, some authors refer to investment decisions, whereas others refer to the decision on a portfolio of IS[13]. Formulating an information strategy results in IS that cater to the company's strategy or objectives. Which IS these are depends on the business strategy model used (see the appendix in (Chan and Huff 1992) for a list of business strategy models). For example, information strategy content could comprise IS that

- support the firm's approach to differentiate itself on the market (e.g. low cost vs. quality leader)
- support market penetration, product development, market development, or diversification (following Ansoff's product market matrix model of strategy (Ansoff 1965))
- support the defender, prospector, analyzer, or reactor strategy (following Miles and Snow's strategy types (Miles et al. 1978)).

The definitions of business strategy also included a rather broad understanding of business strategy as all kinds of business objectives. Then, all IS that fulfill any business objective become part of information strategy. Table 6 lists the business strategy models that we found in the articles along with the respective implications for information strategy content. Although

[13] The term "application portfolio" or "IS portfolio" is misleading. Originally, the term portfolio was used to express the need to balance the positive (return) and negative (risk) characteristics of investments. However, the articles mentioning an IS portfolio as the main decision object of information strategy do not necessarily seek to come to a balanced selection for the IS a company might want to develop. The portfolio here is simply the overall set of IS that support a given business strategy. A company might want to develop a number of other IS that do not directly support the business strategy; these IS would have to be included in an IS portfolio that tries to balance investments, as well.

we counted only six articles following this conception, one has to be aware that these account for almost twenty percent of our sample.

Besides the articles included in Table 6, there are a number of other articles that look at which information systems companies use in order to support a given business strategy. However, these articles do not refer to information strategy per se (or any other related term) but only to the "strategic uses of IT" (e.g. Camillus and Lederer 1985; Segars et al. 1994, both looking at IS in support for Miles and Snow's strategy types). Other research works (e.g. McFarlan et al. 1983) focus on how IS can support Porter's generic strategies of cost leadership, differentiation, or focus: "In any company, information technology has a powerful effect on [… competitive strategy …] in either cost or differentiation" (Porter and Millar 1985, p. 156). These works propose the analysis of all activities of a company's value chain (Porter 1985) and the links between them in order to identify how IT/IS can either cut costs (e.g. by automating activities) or provide differentiating value to the firm. As we cannot assume that the authors intended to make statements on information strategy content, their work was not included in our review. However, these works fit into this conception of information strategy.

Strategy model/theory used	**Source**	**Information strategy content**
Ansoff's growth matrix (Ansoff 1965) Miles and Snow's strategy types (Miles et al. 1978)	(Atkins 1994)	Investment proposals for IS to support chosen business strategy
Any kind of business objectives	(Gottschalk 1999a; Gottschalk 1999b; Gottschalk 1999c; Hoey 1998)	IS used to support the business objectives
Strengths, Weaknesses, Opportunities, Threats (SWOT)	(Hatten and Hatten 1997)	IS that support any business strategy derived from the SWOT analysis

Table 6: Information strategy content for supporting business strategy

2.3.2 Information strategy as the use of IT to gain competitive advantage

Just as for the previous conception, articles in this category share the feature that information strategy only exists as part of business strategy. However, these articles focus on a certain part of business strategy, namely competitive strategy. Competitive strategy is concerned with one major question of business strategy, namely how to gain competitive advantage (e.g. Hofer and Schendel 1978, p. 25). Most importantly – and eventually justifying a separate discussion – rather than anchoring information strategy in a given strategy, the *anchor* in this case is not the firm's business strategy but *competitive theory*. Accordingly, the objective of many papers is to construct or test a certain theory on IT-based competitive advantage. Information strategy then answers the *question "How can the use of IT support gaining a competitive advan-*

tage?" (Brady and Targett 1995a; Duhan et al. 2001; Hidding 2001). Duhan et al. (2001) propose that an information strategy's intent is "to search for competitive advantage through its [IT] use." The foundation for answering "How can firms achieve, and for how long can they sustain, a strategic IT advantage?" is "IT strategy logic" (Hidding 2001).

Information strategy conception	**Information strategy definition**	**Source**
Information strategy as the use of IT to gain competitive advantage	search for competitive advantage through IS/IT use	(Duhan et al. 2001)
	using IT to gain competitive advantage	(Brady and Targett 1995a)
	sustaining competitive advantage using IT	(Hidding 2001)
	the analysis of the role that information systems can play in helping business units or companies to define a route to competitive strategy [defined as "the route to competitive advantage" referring to (Porter 1980)]	(Wilson 1989)

Table 6: Definitions of information strategy as the use of IT to gain competitive advantage

In the articles following this conception, strategy logic builds on two different theories of competitive advantage: the market-based view (MBV) and the resource-based view (RBV) as depicted in Table 7. It is not surprising to find these two theories given that they also happen to be the most common theories on competitive advantage in management studies (cf. e.g. Carr 2004a, p. 14; Kirsch 1996, pp. 204).[14]

Theoretical basis	**Application of theory to information strategy**	**Implications for information strategy content**	**Sources**
Market-based view (Porter 1980)	How can IT create competitive advantage by influencing market or industry forces external to the company?	Identification of Strategic Information Systems (SIS)	(Brady and Targett 1995a) (Wilson 1989)
Resource-based view / Core competencies (Prahalad and Hamel 1990) (Williams 1992; Williams 1998)	How can IT be a strategic (valuable, rare, inimitable, etc.) resource? How can IT support strategic resources or be combined with other resources to gain and sustain a competitive advantage?	Identification of strategic IT-related resources "The task [of developing an IS strategy] then becomes […] competence leveraging and building, and investigating the ways in which IS/IT can facilitate and enable these" Identification of IT resources that are essential for other (non-IT) resources to be strategic.	(Duhan et al. 2001) (Hidding 2001)

Table 7: Theories of competitive advantage applied in information strategy research

[14] Carr refers to the "industry-based view" and the "resource-based view"; Kirsch talks about an "outside-in" vs. an "inside-out" approach.

In order to derive the content of information strategy from these theories, it is necessary to discuss the application of these theories in IS research further in the following paragraphs.

MBV and RBV theory in strategic management

Both views recognize that competitive advantage can only be gained through a fit of the internal situation with the external situation. They differ significantly on what they regard as the predominant source or basis for competitive advantages, however: "privileged market position" (MBV) vs. "unique firm-specific resources" (RBV) (Cool et al. 2002, p. 55). Thus, the source of competitive advantage in MBV theories is sought outside of the organization (within the industry or market), while in RBV theories, the source is sought within the organization, in its unique resources. The MBV has mainly been driven by Porter's (1985) extension of industrial organization research, specifically his "five industry forces" (Porter 1980).

In contrast to the MBV, the RBV proposes that the origin of competitive advantage lies within the firm, more specifically in a firm's "resources" (Whittington 1995, p. 26). Consequently, the decisions to be made strategically (i.e. as part of the strategy) concern a firm's internal resources much more than e.g. industry forces external to the company. Although the definition of resources themselves remains blurred ("'resources' [and capabilities] remain an amorphous heap to most of us" (Wernerfelt 1995, p. 172), there is considerable consensus (cf. Wade and Hulland 2004, p. 115) on the characteristics of those resources that are "strategically relevant," i.e. that "can be a source of sustained competitive advantage for a firm" (Barney 1991, p.102). Barney (1991) summarizes four criteria for a resource to be considered of strategic relevance: it must be valuable, rare, imperfectly imitable, and not substitutable (similarly found in Grant 1991; Wernerfelt 1984).

Applications of competitive theory in IS research

Much literature has been written from the perspective of MBV and RBV theories on the impact of IT on competitive advantage[15]. This literature is discussed below.

Applications of MBV theory in IS research

The use of IT (or its application in information systems) to gain competitive advantage has been said to be "one of the major business stories of the 1980s" (Vitale 1986). A concept that emerged from this discussion was that of "strategic information systems." Strategic informa-

[15] Even though much of this literature often does not refer explicitly to information strategy

tion systems (SIS) are IS that support or shape the competitive advantage of a company[16] (Senn 1992, p. 7; Wiseman 1985, p. 7). Most of the articles from that time make use of Porter's five forces model to explain the competitive impact of IS (Eardley and Lewis 1996). Several research articles address the question of how IT/IS can alter any one of the five forces (e.g. Bakos and Treacy 1986; McFarlan 1984; Porter 2001; Porter and Millar 1985). The evidence for IT's ability to do so is mostly provided in the form of anecdotal case examples; more than 60 examples are listed by Kettinger et al. (1994, Appendix A). Examples of SIS affecting almost all of the five forces can be found in the literature (e.g. Eardley and Lewis 1996, p. 405, table 3 matches 8 SIS cases against the five forces addressed by each SIS; the appendix on pp. 407 gives a brief description of these cases). Hence, following the MBV the *content* of information strategy is a *set of IS aimed at gaining competitive advantage*.

However, researchers criticize that the competitive impact ascribed to the SIS in these cases – and to IT in general – is not sustainable, i.e. only temporary (Senn 1992; Eardley and Lewis 1996). One argument used is that of easy replication or imitation. This is because technology itself is "available to all firms" (Clemons and Row 1991, p. 289). This argument has been especially stretched by Carr (Carr 2003; Carr 2004a; Carr 2004b) in his well-known claim that "IT doesn't matter." He argues that as IT becomes a standardized commodity – just like energy or telephones – it loses its ability to lead to a sustainable competitive advantage. A number of authors retort that it is not IT itself that provides the advantage at all, but the way it is adopted and applied (Senn 1992, Hackney et al. 2000). However, Porter's theory – with its external, market-based perspective – was deemed incapable of explaining differences in the internal use of IT. This criticism has certainly given rise to the use of other theories to explain the relation of IP to competitive advantage, especially the RBV, since it takes a firm-internal perspective.

Applications of RBV theory in IS research

Applications of the RBV in IS look at factors internal to a company. The focus is on IP resources (not limited to IT itself) and whether they are strategic, i.e. fulfill the criteria of inimitability, rarity, etc. (e.g. Mata et al. 1995). Among these IP resources are the management of external relationships, market responsiveness, IP-business partnerships, IP management skills, IP technical skills, IP infrastructure assets, IP innovation ability, and cost-effective IP operations (Wade and Hulland 2004, p. 111, especially Tables 1 and 2). In line with the criticism of

[16] Senn (1992) stresses that SIS are not a type of application or information system (such as operational systems or transactional systems). An SIS is defined merely by its impact on competition. Thus, any type of IS can act as an SIS whether it is a system for production or administration, a batch system or transaction system, etc.

the MBV-rooted works mentioned above, the RBV points out that most IP resources might not meet the criteria cited above: technologies, financial resources, technological skills, etc. are available to most firms and can thus be easily imitated (Mata et al. 1995). Hence, the notion of "resource complementarity" came into focus (Powell and Dent-Micallef 1997). Resource complementarity means that a resource may influence another resource and that their combined use (in contrast to each individual resource) affects competitive advantage. Wade and Hulland (2004, p. 123) synthesize this in the following statement: "the RBV as currently conceived fails to adequately consider the fact that resources rarely act alone in creating or sustaining competitive advantage. That is particularly true of IS resources that, in almost all cases, act in conjunction with other firm resources to provide strategic benefits." The latter part of the statement describes what is meant by resource complementarity: IP might contribute to a company's competitive advantage if combined with other non-IP resources owned by a firm (e.g. Powell and Dent-Micallef 1997). For example, it might be that only when IT is used in a certain process (one kind of resource) that this resource pair (e.g. use of a certain IS and the specific process supported by the IS) comes together to form a competitive advantage for the firm (cf. Wade and Hulland, p. 130). This proposition emphasizes a firm's specific way of employing IT over IT itself.

While the resource complementarity proposition sounds intuitive, it nonetheless remains a proposition. The nature of the complementarity effect remains largely unknown (Amit and Schoemaker 1993; Dierickx and Cool 1989): "the role of resource complementarity within the theory has not been extensively developed" (Wade and Hulland 2004, p. 123). However, what can be learned from the RBV is that the relation between IP and competitive advantage is more complex than assumed by MBV research as well as early RBV research in Information Systems.

In the RBV, the main *content of information strategy* becomes identifying and using a set of IP resources that exhibit, either themselves or by complementing other (non-IP) resources, the strategic characteristics mentioned above. The concept of a "resource" is still very ambiguous, as is that of an "IP resource." Three recent reviews present overviews of what potential IP resources might be (Melville et al. 2004, Table 3; Piccoli and Ives 2005, Table 1; Wade and Hulland 2004, Table 2). These proposals are compared in Table 8. They lack consensus, disagreeing e.g. on whether and how the resources fulfill the characteristics of strategic IS resources (see the role of IT infrastructure in Piccoli and Ives (2005) and Wade and Hulland (2004) in Table 8 or the different levels of categories such as "assets" and "responsiveness"). Wade and Hulland (2004, Table 4) hold that none of the proposed IP resources fully conforms

to the characteristics of strategic resources and hence cannot fully create or sustain advantage. Piccoli and Ives (2005) suggest that all of the resources mentioned can at least help in sustaining the advantage. This suggests that RBV theory in IS is at a rather early stage.

(Melville et al. 2004)		(Piccoli and Ives 2005)		(Wade and Hulland 2004)	
Category	**IP Resources**	**Category**	**IP Resources**	**Category**	**IP Resources**
Techno-logical IT resources	Infrastructure "shared technology and technology services across the organization"	***IT assets***	IT Infrastructure "the foundation for the delivery of business applications and services" As it takes a long time to develop an IT infra-structure, its ability to act as a "barrier to erosion is likely to be very substantial"	***IS infra-structure***	The "IS infrastructure resource has generally not been found to be a source of sustained competitive advantage"
	Applications "that utilize the infra-structure"		Information repositories		
Human IT resources	Technical skills "programming, systems integration, database development"	***IT capabili-ties***	Technical skills "ability to design and develop effective informa-tion systems [… e.g.] systems analysis and de-sign, infrastructure design, programming" "allow firms to more easily adopt and use IT"	***IS technical skills***	"held by the IS/IT employees of a firm" "some IS skills cannot be easily transferred […] and, thus, these resources become a source of sustained competitive advantage"
	Managerial skills "collaboration with business units and external organizations, project planning"		IT management skills "ability to provide leadership for the IS function, manage IT projects […]" "form the basis for envisioning and producing […] IT-dependent strategic initiatives"	***IS planning and change manage-ment***	"the capability to plan, manage, and use appropriate technology"
			Relationship asset "rapport […] between the IS function and the business" "can take years to develop"	***Manage-ment of external relation-ships***	"ability to manage linkages between the IS function and stakeholders outside the firm […] suppliers […] outsourcing partners […] customer relationships"
				Manage-ment of internal relation-ships (IS-business partner-ships)	"integration and alignment between the IS function and other functional areas or de-partments" "Such relationships help to span the […] gaps […] between functions and departments, resulting in superior competi-tive position and firm performance"

(Melville et al. 2004)		(Piccoli and Ives 2005)		(Wade and Hulland 2004)	
Category	**IP Resources**	**Category**	**IP Resources**	**Category**	**IP Resources**
		Technology characteristics	Visibility, uniqueness, complexity		
		Implementation process characteristics	Complexity, process change		
				Market responsiveness	"abilities to develop and manage projects rapidly […] and to react quickly to changes in market conditions" "A key aspect of market responsiveness is strategic flexibility, which allows the organization to undertake strategic change when necessary"
				IS development	"capability to develop or experiment with new technologies [… and …] alertness to emerging technologies and trends"
				Cost-effective IS operations	"the ability to provide efficient […] IS operations on an ongoing basis [… to] develop a cost leadership position" "the ability to avoid […] cost overruns, unnecessary downtime, and system failure is likely to be an important precursor to superior performance"

Table 8: Comparison of recent IP resource classifications following the RBV

2.3.3 Information strategy as a plan for the whole "IP domain"

While the previous conceptions emphasize the "strategy" part of information strategy, the articles counted in this conception focus on the "information" or "IP" part.

The ***anchor*** for such an information strategy is neither business strategy nor competitive theory but rather the elements of the *IP* "*domain*." We define the IP domain as the collection of all IP artifacts and other objects (e.g. IP budget, applications, infrastructure, and personnel). The assumption underlying this conception is that different IP elements[17] within the IP domain have to be planned. This planning happens on strategic, tactical, and operational levels. An information strategy is then the plan for IP elements on a strategic level: "the [information strategy] model is specifically structured to ensure that the necessary strategic issues have been examined, before information systems management are asked to draw up detailed tactical and operational plans" (Hayward 1987).

An information strategy in this sense answers the *question "What are the IP elements that have to be planned on a strategic level?"* Unfortunately, the "strategic" part is rarely explicated or substantiated with reasoning. Digging deeper into some of the (few) reasons provided, we found two of them. On the one hand, some articles allude to long-term firm performance. For example, Reponen (1994) proposes that business performance[18] "arises from a good understanding and good management of the whole IS field, and not only from the competitive applications of IT." Conrath et al. (1992) state that "a sound, strategic IS plan is able to induce significant change in the organization's performance by fundamentally changing the way the organization does business". On the other hand, we find the logic of avoiding risks or negative impacts. For example, Hayward (1987) states that strategic IP planning needs to "bring an out-of-control IS function into line" and to avoid the "technology traps" and "inconsistency" of technologies, because otherwise "an organization may be tied to" these decisions. Similarly, Lucas and Turner (1982) talk about "controlling information processing." If a company has no control of information processing, "it may be depriving itself of the opportunity to gain a major competitive advantage through the creative use of technology." They add that "effective control of information processing is a necessary prerequisite to the integration of technology with strategy. If information processing is viewed as a failure [out of control], managers will refuse to rely on it for a major role in the formation and execution of corporate strategy." In summary, while we have found a "positive" logic underlying the strategic char-

[17] We do not use the term "IP resources" in order to avoid confusion with RBV terminology.

[18] In fact, he uses the term "competitive advantage" but uses it indiscriminately with desirable firm performance.

acter of IP decisions (use IT to gain positive strategic impacts) so far, we now find a rather "negative" logic (plan IP to avoid negative strategic – i.e. irreversible, significant, organization-wide – impacts).

The articles arrive at IP elements in one of two ways: either inductively or deductively. In those taking the inductive route, a list of IP elements (and related decisions on these elements[19]) to be included in an information strategy is presented. This list is generated bottom-up through a literature review and potentially also validated empirically by asking practitioners to rank the elements by perceived importance. In the deductive approach, a certain logic for structuring the information strategy content is presented up front. Here, the resulting decision areas (i.e. groupings of IP elements) are also related to each other. These two approaches are discussed below separately.

2.3.3.1 Information strategy as an issue list

Here, information strategy is defined through a list of decisions or decision areas (groups of IP elements comprising the IP domain) that are considered strategic. The proposed lists are derived inductively either from the authors' experience (Pyburn 1983; Wexelblat and Srinivasan 1999) or stated in a normative fashion (Conrath et al. 1992; Lederer and Salmela 1996; Reponen 1994). Alternatively, propositions from the literature are accumulated eclectically (Das et al. 1991). In the end, an issue list can take a more or less structured form if the issues are grouped bottom-up. Table 9 shows a selection of the issues lists in our article base.

Source	Proposed content	How is the list derived?
(Conrath 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 plan Personnel plan Facilities plan Projection of possible future user environment Organization plan Education plan	With reference to (McLean and Soden 1977). The items are ranked empirically through a survey. (McLean and Soden 1977, pp. 69) propose the list normatively and have it ranked through a survey.

[19] Given that we defined the content of information strategy as decisions, these would then be decisions on these elements. If these are not stated directly in the articles, they again have to be inferred. For example, if the application portfolio is an IP element within the IP domain, there are still several decisions to be made vis-à-vis this element, such as selection of applications for the portfolio, definition of criteria for doing so, deciding on who will be making these decisions, etc. Hence, the application portfolio is a "decision area" rather than a decision in itself.

	Projection of possible future industry environment Summary of strengths and weaknesses of staff Comparison of past IS performance vs. plan Alternate strategies	
(Lederer and Salmela 1996)	Summary of organization's IT strategy Data and application plan (initial data entities, high-level specification of applications, 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 Appendix	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).
(Das 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 through 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).
(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.
(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 hardware, software, networks, data systems IT support for knowledge management: ability to store and retrieve information relevant to tasks and decision processes	Referencing Pervan (1998) who provides an empirically ranked list of CEO's issues with regard to IT.
(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.
(Reponen 1994)	External opportunities for using IT as a competitive weapon	Normative proposal.

	Internal opportunities for supporting competitiveness by means of IT Other application areas of IT Organizing the information management function Rough architecture of IT Estimation of the IT capacity needs Estimation of the benefits of strategy realization	

Table 9: Articles understanding information strategy as an issue list

The table documents that the proposed lists differ in several ways. First, they differ in the number as well as in the content of the items proposed as part of an information strategy. Second, they provide different levels of detail. Some proposals remain rather vague regarding what has to be decided. For example, what is a "hardware plan"? Does it define capacities needed or should it go down to the level of actual products? Other proposals are very clear on the decisions that have to be made (e.g. decisions on retiring older systems). Consequently, there is no easy way to summarize all of the proposals that fall into this category other than by their formal representation (as a more or less structured list that has been built bottom-up) and their implicit aim to be fairly exhaustive in planning the "IP domain."

However, it is extremely difficult to assess whether the proposed lists are indeed exhaustive. One reason for this is that the authors do not explain why the lists can be assumed to be comprehensive. Another reason is that more often than not, no obvious structure is provided. An exception is given by Das, Zahra, and Warkentin (1991, p. 957), who sort their nine categories (see Table 9) into four groups. They come up with the groups "distinctive competence," "information systems technology," "systems design and development," and "MIS infrastructure." This structure reduces the complexity of the list. Still, such a structure remains artificial, because it is applied to a "range of issues" (Galliers 1993). Instead of presenting a logic up front and deriving the proposed items from this logic, the structure is applied to the collection of items ex post.

2.3.3.2 Information strategy as a system of plans

In contrast to the inductive approach, the deductive approach derives the elements of the IP domain (decision areas) and their relations by logical considerations a priori or top-down. By delineating decision areas and proposing relations between these areas, the structure becomes a system of decision areas or sub-strategies that are interrelated. The different sub-strategies address specific questions related to the long-term development of parts of the "IP domain" such as the application portfolio, the IT architecture, or the information function. The proposed decision areas differ, as do the relations between them. Table 10 presents an overview of information strategy models used together with the logic provided to structure the content

of information strategy. Consider the following examples from the table to illustrate the differences in components and logic: Earl (1989) proposes structuring the IP domain by asking for "the what," "the how," and "the who."[20] This results in the parts of information systems (IS: applications: what do the business users want?), information technology (IT: how are the applications delivered?) and information management (IM: who is responsible for delivering the systems via the technology?). Accordingly, information strategy is structured into IT, IS, and IM strategy. (Galliers 1991) argues that information systems are socio-technical systems and hence are not only about technology, but also about human resources. This leads him to add an IP-related HR sub-strategy. He structures information systems strategy into information strategy, IT strategy, IM strategy, HR strategy, and change management strategy. Henderson and Venkatraman (1993) propose structuring information strategy in analogy to what they believe to be the structure of business strategy (e.g. in IT scope, IT capabilities, etc.).

Article	**Information strategy model used/components of information strategy**	**Logic for structuring IP domain**
(Henderson and Venkatraman 1993)	External domain: how the firm is positioned in the I/T marketplace 1 IT scope: technologies (e.g. LAN/WAN) that support current/shape new business strategy initiatives 2 Systemic competences: attributes of I/T strategy (system reliability, flexibility, interconnectivity) can contribute positively to/shape business strategy 3 I/T governance: mechanisms (e.g. joint venture) for obtaining the I/T competences Internal domain: how the I/S infrastructure should be configured and managed 4 I/S architecture: choices defining the application portfolio, configuration of hardware/software/communication, data architecture 5 I/S processes: work processes central to the operations of I/S infrastructure 6 I/S skills: choices regarding the acquisition, training of the knowledge required to manage and operate I/S infrastructure However, it is unclear whether the external and internal domain are part of IT strategy. On the one hand, "I/T strategy should be articulated in terms of an external domain and an internal domain" (p. 6). On the other hand, Figure 1 in the article depicts only the external domain as part of "I/T strategy."	Analogy to business strategy: business strategy is claimed to consist of scope, competences, and governance. Hence, an information strategy should be built in compliance with this structure.

[20] Earl changed original "wherefore" later to "who"

(Hayward 1987)	1 Strategic requirements plan: organizational objectives and strategies, IS mission related to business strategies; assessment of environment, IS policies, objectives & strategies 2 Management strategy: policies, objectives and strategies for management of the IS function (reporting and control structure; degree of decentralization; standards, security, education) 3 Application strategy: information requirement of the enterprise, resource/priority allocation, project planning; information architecture 4 Technology strategy: data strategy, communications strategy, distribution strategy, software 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.
(Lucas and Turner 1982)	1 Selection of application areas/types of applications 2 Operations needs 3 Implications for staff and equipment 4 Organizational structure of IS function (central vs. decentral) 5 Charging	Processual/sequential structure.
(Smits et al. 1997) (Smits and van der Poel 1996)	"Scope, objectives, architectures, rules and plans" citing (Earl 1989) 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 design and project plans"	The authors themselves do not provide reasoning; Earl (1989) provides a different structure (see below).
(Brady et al. 1992)	(Earl 1989) "triangle model"	IT domain should be broken down into "IS", "IT", "IM" in response to the questions "what," "how," "wherefore" (later changed to "who")
(Galliers 1991)	Claims to extend (Earl 1989); in fact, the model is quite different. 1 Information strategy: required information to support business strategy formulation and business processes 2 Information management strategy 3 Information technology strategy 4 Change management strategy 5 Human resource (IS-related) strategy	Change management and HR strategy are added because information systems (or the "IS domain" in Galliers' parlance) are socio-technical systems. Hence, the human aspects are as important as the technological aspects.
(Flynn and Hepburn 1994)	Relies on a previous edition of (Ward and Peppard 2004) 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; investment policies; IS accounting	Same as Earl (1989).

Table 10: Articles understanding information strategy as a system of plans

Again, the proposals differ too widely in terminology, number of components, and decisions on the components (if any) as well as logic (if any) and do not go into enough detail to allow the formation of a final synthesis regarding the implied content of information strategy.

What we also see is that many of the articles in Table 10 (the last four) refer to textbooks (e.g. Earl 1989; Ward and Peppard 2004) that have elaborated considerations rather than to research findings presented in articles. In fact, books or book chapters (e.g. Earl 1989; Galliers 2004; Ward and Peppard 2004) and non-research articles, such as editorials (Galliers 1999; Galliers 1993a), have elaborated much more on information strategy than articles. Earl (1989) presented a very well-received proposition (cf. e.g.Galliers 1991; Ragu-Nathan et al. 2001; Ward and Peppard 2004). Meanwhile, it has undergone several extensions (Earl 1996; Earl 2000) (see Figure 7 for the original and extended models). Since most of the referenced textbook models of information strategy go back to Earl's model (see Figure 6 for an "inheritance tree" derived by tracking the references used between the original descriptions of the models), we will discuss this model in some more detail.

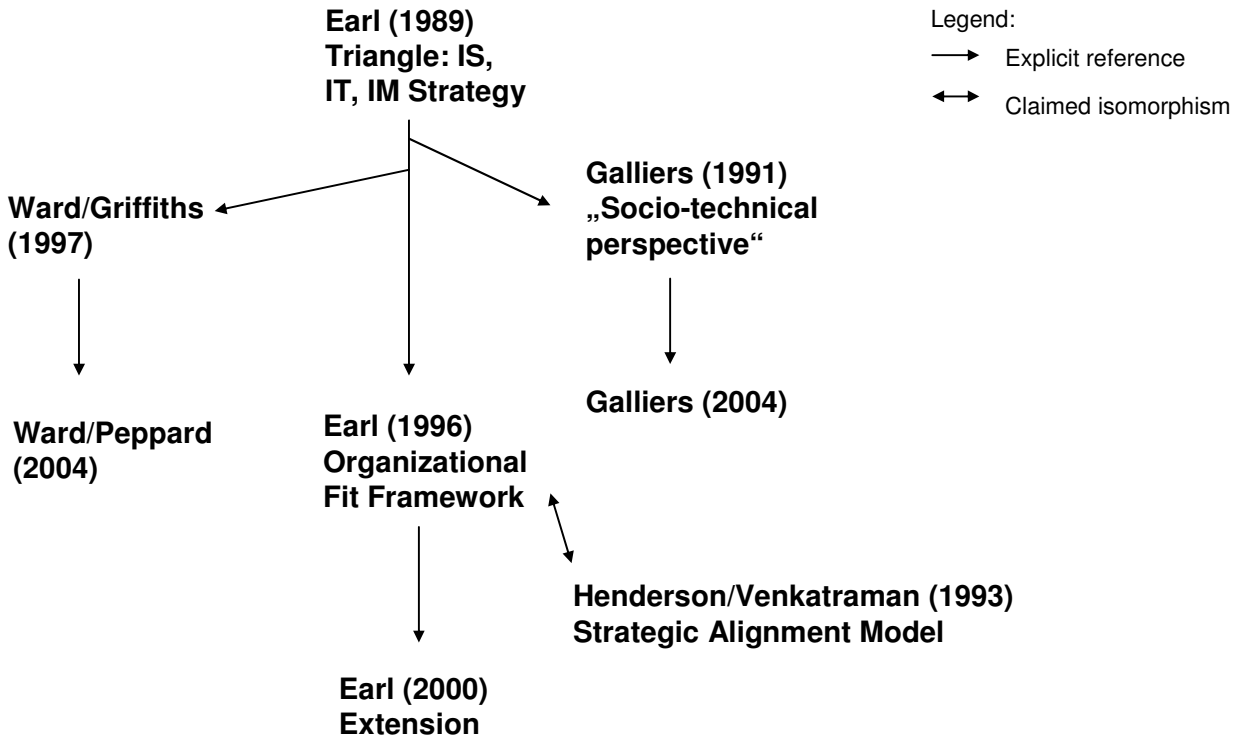


Figure 6: "Inheritance tree" of the most popular information strategy models

Earl identifies three sub-domains (the "triangle model") called "Information Systems (IS)," "Information Technology (IT)," and "Information Management (IM)" by asking "What has to be done?" "How does it have to be done?" and "Who should do it where?" (see Figure 7, a):

- IS strategy (see Earl 1989, pp. 67-94) addresses the application portfolio. As such, IS strategy comprises an "application development portfolio […], a 'shopping list' of applications and projects" (Earl 1989, p. 68). Labeling the portfolio as a "shopping list" already indicates that such an application portfolio comprises all kinds of applications, not only those that are related to business strategy, competitive advantage, or any other strategic business goals. In this sense, it is different from those applications portfolios mentioned in the first conception. Nevertheless, Earl characterized IS strategy as business-led and demand-oriented in that it is about "aligning IS development with business needs."

- IT strategy (see Earl 1989, pp. 95-116) is concerned with technology policies and addresses questions related to computer, communication, data, and application architectures. Each of these architectures is described by a set of design parameters, schemas (models or blueprints), policies and goals as well as plans to achieve these goals. According to Earl, the structure of IT strategy is a matrix of elements (computing, communications, data, and applications) and levels (parameters, schemas, policies, and plans). IT strategy is regarded as the supply side of the IS strategy. This becomes evident when Earl equates IT strategy with the "how" in contrast to the "what" of IS strategy. Furthermore, he explicitly holds IT strategy to be supply-oriented and technology-focused, and sees its main purpose as being "to ensure efficient (especially reliable) and effective delivery of the IS strategy" (Earl 1996, p. 495). Thus, in his view, IT strategy is subordinate to IS strategy.

- IM strategy (see Earl 1989, pp. 117-128) "guides how the organization should run IS/IT activities" (Earl 1989, p. 117). It includes decisions on "the role and structure of IT activities in the organisation," "relationships between specialists and users and between the centre and divisions or business units," "management controls for IT," "management responsibilities," "performance measurement," and "management processes" (Earl 1989, p. 65). Earl summarizes IM strategy as being "concerned mainly with the relationship between the IS/IT function and the rest of the business" (Earl 1989, p. 118).

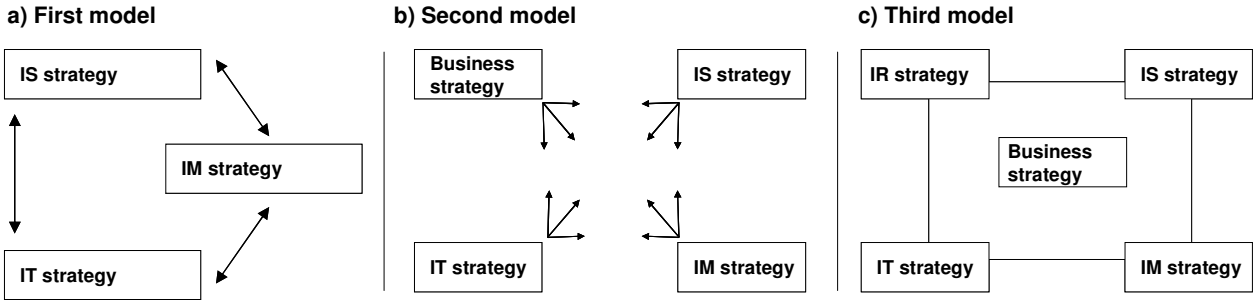


Figure 7: Earl's original information strategy model and its extensions

Presenting information strategy as a system of plans extends enumerative lists with respect to structure and reasoning. Still, these systems leave important questions open. Especially the reasoning used to support the models is not based on theory but on common sense or analogy. This includes the reasoning for including exactly the proposed elements as well as the relations between them.

- For example, Earl bases his mode on common sense, posing the three questions of "what," "how," and "who." Accordingly, the strategic relevance of the planning sub-domains and the reasons for their distinction remain unproven. Earl (1996, p. 499) himself feels that his model is "not […] either complete or fully validated." Thus, it is not surprising that he later (Earl 2000) adds another domain labeled "information as a resource" (see Figure 7, c). The interrelationships among the domains – first covered in an extension of the original model (see Figure 7, b) – and the relations between each domain and business strategy remain ambiguous. However, Earl himself perceives this as a problem and addresses it in a later publication (Earl 1996) by proposing interrelationships between business strategy and the three information strategy domains presented earlier. But even in this work, he admits that his proposals remain "conjectural" (Earl 1996, p. 491). Other authors have also observed that "the relationship between […] IT, IS and information management (IM) are unclear" ((Allen and Wilson 1996) citing (Boaden and Lockett 1991)).
- Another example is furnished by Henderson and Venkatraman (1993), who make an analogy to an assumed mainstream understanding of business strategy to distinguish different decision areas of information strategy. Using analogy to propose components of strategy construes something that "looks like a strategy," but does not necessarily link to strategic impact. For example, they argue that scope is a component of business strategy and thus is also part of informa-

tion strategy. However, they do not link the scope component of information strategy to the scope of the firm. They simply argue that if business strategy has a scope component, then information strategy should, too. While business scope refers to "which businesses to be in," information strategy scope refers to the technologies to be used within the company.

Merely from looking at the graphical representation of these models (e.g. Figure 7), some of the reasoning seems to be hidden in the 'black box' termed "business strategy". This shortcoming in reasoning of the proposed decision areas has led other authors to question their strategic relevance: "'IS strategy (which concerns the application portfolio) and 'IT strategy' (which includes technology policies such as architecture and standards) may be in no way strategic in themselves" (Knights et al. 1997, p. 31).

Despite these open questions – which equally apply to the other models proposed or referenced in the articles – a number of articles build on these models (see tables above) without questioning their validity.

Information strategy in this conception is a strategy in its own right, i.e. separate from business strategy. As a consequence, it has been demanded to "align" both strategies in order to achieve consistency in managerial decisions. This also becomes obvious from the graphical representations of the models proposed by the authors in which separate graphical elements (boxes) are used for business strategy and information strategy (cf. Figure 7, b).

2.3.4 Information strategy as a functional strategy

A number of authors define information strategy as a "functional strategy" (e.g. Adler et al. 1992; Smits et al. 1997; Smits and van der Poel 1996). This perception is even more prevalent in textbooks (Boddy et al. 2005, pp. 90; Lehner 1993, p. 16; McLeod 1998, p. 40, 48). Labeling information strategy as a functional strategy advocates the classification of strategies into either corporate, business unit, or functional strategies, which goes back to Vancil and Lorange (1975) (see Section 1.1.1).

However, very few authors go beyond the mere classification of information strategy as a functional strategy (see Table 11). Adler et al. (1992) understand information strategy as the strategy of the IT unit. In this sense, information strategy can be compared to strategies of other functional units, like the marketing or R&D unit, recognizing that "all the functions manage their internal operations strategically" (Adler et al. 1992, p. 19). This implicitly follows the stance taken by researchers looking at "technology strategy [which] is a functional

strategy: a set of means and ends chosen within a specific function within a business unit" (Weiss and Birnbaum 1989, p. 1014). Such a functional strategy defines e.g. the "function's overall posture and directions" (Adler et al. 1992, p. 20).

In the original sense, a functional strategy would encompass departmental decisions that help to implement requirements of business strategy. However, in the articles we found, the information function is equated with the IT unit (one of potentially many organizational entities of the function). The IT unit is characterized as a "business within a business" (Adler et al. 1992, p. 20; Ragu-Nathan et al. 2001, p. 271) or an "organization within an organization" (Ragu-Nathan et al. 2001, p. 277) that requires "due attention to its key processes, resources, and internal and external linkages" (Adler et al. 1992, p. 20). As a business (Ragu-Nathan et al. (2001) state that "it is in the business of providing services to users within the organization who, therefore, may be regarded as customers" (p. 277)), it also requires its own (functional) "strateg[y] […] directed toward developing an end product (i.e. information systems) which is sought by users" (p. 278). Following such an understanding, the functional strategy is more independent of the business strategy than in the original sense.

The starting *anchor* for an information strategy as a functional strategy is the *information function (or IT unit)***,** with its objectives. The *question* that is answered by such an information strategy is, *"Which resources are needed to fulfill the functional or departmental objectives?"*

Consequently – in terms of *content* – a functional information strategy is restricted to *decisions that affect the information function and* the *IT department* associated with it: its mission, sourcing of departmental resources, resource allocation within the IT unit, organization, etc.

That information strategy in this understanding is separate from business strategy becomes clear in statements like "the function has a clear sense of its purpose and [...] its own, localized mission" (Adler et al. 1992, p. 21). These statements suggest that the IT functional unit has a strategy that is separate from the overall business strategy and the other units' functional strategies. However, unlike other functions, the use of information, information systems, etc. permeates the whole enterprise in almost every process (Porter and Millar 1985). This means that certain IP decisions "are not located solely in the IS function" (Peppard and Ward 2004, p. 177) and are hence left out by a functional information strategy. To address this issue to a certain extent, a number of authors propose aligning the information strategy with all other departmental strategies and overall business strategy (see Figure 8 according to (Boddy et al. 2005, p. 91)).

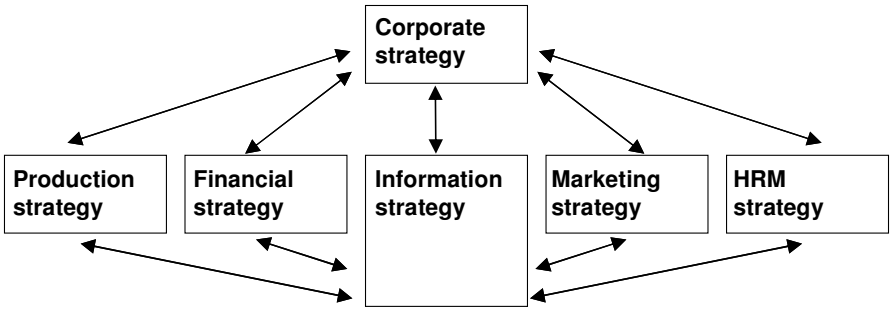


Figure 8: The need to align a functional information strategy with all other functional strategies

Article	Information strategy components
(Adler et al. 1992)	1 Posture and direction: mission, objectives, strategic plans of the function 2 Policies (on processes (recruitment, development, project selection, quality assurance), resources (funding, facilities) and internal/external linkages (organizational structure, interfaces with other functions, links to external actors, approach to regulatory compliance)); allow managing technology as a "business", "guiding day-to-day decision making" 3 Adjustment processes: in order to adapt the technical functions strategy, the strengths/weaknesses of the function's capability and opportunities/threats from the market are assessed
(Ragu-Nathan et al. 2001)	"deals with management of the entire information systems function" "views an organization's IS as a stand-alone 'business within a business'" The IT unit is a "business within a business" or an "organization within an organization" "It is in the business of providing services to users within the organization who, therefore, may be regarded as customers: it is also in competition with these same customers for allocation of significant levels of organizational resources" "providing quality services to organizational customers […] requires a set of management strategies that are directed toward developing an end product (i.e. information systems) which is sought by users"

Table 11: Articles understanding information strategy as a functional strategy

2.3.5 Information strategy as the tenor towards IP

The previous two conceptions cover a broad range of decisions as part of information strategy content. Works we counted in this third conception basically equate information strategy with answering only one central ***question***, namely "*What is our organization's tenor towards IP and the use of IT?*"

The ***anchor*** is *management's attitude* towards IP and/or the *needs of the industry*. Agreeing on a tenor provides the whole organization with a fundamental guideline giving an orientation for subsequent IP-related decisions. Other IP-related decisions are hence contingent on the chosen tenor. For example, a common tenor ensures that "all members are heading in the same direction" (Tai and Phelps 2000). This leads to "building some consensus regarding the

role of IS vis-à-vis the rest of the firm and the resources that will be committed to achieving that role." (Pyburn 1983)

The ***content*** of information strategy in this conception includes the *decision on* which *tenor* towards IP the organization should adopt and potentially also includes principles or maxims for breaking this tenor down into other decision areas, such as investing in IP, the role of the IT unit, etc. We find different proposals for alternative tenors in our article base; these are listed in Table 12.

Some authors express the tenor towards IP in terms of IT's role and significance. For example, McFarlan (originally McFarlan et al. 1983; more recently Nolan and McFarlan 2006) suggests that any company can assign one of four roles to IT. Here, the role of IT is based on the perceived current and future "importance" of IT (more recently changed to the strategic and operational dependence of IT). This way, IT's role can either be supportive, factory, turnaround, or strategic. Here, it is important to note that a company has an information strategy even if IT is not seen to hold a "strategic" role. This is in contrast to the second conception (information strategy as the use of IT to gain competitive advantage): following the second conception there would be no information strategy if the company did not aim at using IT to gain competitive advantage.

Other authors go beyond the role or significance of IT. Their alternative tenors prescribe a certain impetus for investing in and using IT in a certain way. For example, Tai and Phelps (2000) use the term "vision" to refer to the different uses of IT within a company. Following Zuboff (1988) and Schein (1992), they propose that there is a "vision to automate," a "vision to informate up," "to informate down," and to "transform." Chan et al. (1998; 1997b) propose "action," "armor (defensive orientation)," "analysis and risk aversion," and "anticipation (future orientation)" as potential basic orientations towards IT use. These orientations integrate several dimensions of attitudes, such as aggressiveness and defensiveness, proactiveness vs. reactiveness, etc. Similarly, based on Szyperski (1981), Teubner (2007) distinguishes four different types of attitudes towards IT: momentum strategy, defensive strategy, moderate development strategy, or aggressive strategy. Finally, Parsons (1983) (used e.g. in Kanungo et al. 2001; Ward 1987)[21] defines several roles played by IP in the form of "generic IT strategies" (the use of generic IT strategies reinforces that information strategy is again viewed as a separate strategy here). As is already obvious from their labels, these generic strategies ex-

[21] Notably, Parsons (1987) presented his ideas in a teaching note. The fact that research articles rely on teaching notes rather than other peer-reviewed research notes serves as another indication for the poor state of information strategy research.

press a tenor on at least two dimensions: on the one hand, the generic strategies labeled "leading edge," "necessary evil," and "scarce resource" reflect the management's attitude towards IT. On the other hand, generic strategies such as "free market," "centrally planned," and "monopoly" express a stance that is more geared towards fundamental IP governance configurations, i.e. the distribution of IP decision rights among organizational stakeholders (cf. Weill and Ross 2004).

Source	Proposed types of tenor towards IP as information strategies
(Kanungo et al. 2001)	Relies on "generic IT strategy types" (Parsons 1983): centrally planned, leading edge, free markets, monopoly, scarce resources, and necessary evil
(Ward 1987)	Relies on "generic IT strategy types" (Parsons 1983); mapping them to business strategies (Porter's generic strategies), IS evolutionary stages (Nolan's stage hypothesis), and role of IT (McFarlan's strategic grid)
(Ragu-Nathan et al. 2001)	Dimensions of the strategy construct: 1 Aggressive promotion of IS: strategies for marketing the product of the IS "business" to organizational customers 2 Analysis-based development of IS: nature of management processes in planning, controlling, and making decisions about the IS function 3 Defensive management of IS: management actions targeted to protect existing practices, procedures, and configurations (and IS) 4 Future-oriented development of IS: forward-looking posture (e.g. systems to track future trends in place) 5 Proactive management of IS: Does the IS function seek out new systems opportunities on its own? Is it at the forefront of trying out new technologies? 6 Conservative management of IS: Are risks associated with strategic systems recognized in the planning processes?
(Tai and Phelps 2000)	Adapted from (Schein 1992; Zuboff 1988): "Visions of the role of IT": Vision to automate Vision to informate up Vision to informate down Vision to transform
(Teubner 2007) following (Szyperski 1981)	Momentum strategy Defensive strategy Moderate development strategy Aggressive strategy

Table 12: Articles understanding information strategy as the tenor towards IP

2.4 SIMILARITIES AND DIFFERENCES AMONG CONCEPTIONS

Given the different conceptions, we would like to discuss three salient observations in terms of differences and commonalities among them: the first concerns the level of independence of information strategy from business strategy; the second concerns the reasoning or theoretical basis used to support the different conceptions; it also concerns the differences in information strategy content; the last one focuses on other aspects of strategic IP decisions stressed by each conception.

2.4.1 Information strategy: part of business strategy or strategy in its own right?

The first two conceptions (referred to as the first group of conceptions) define information strategy in terms of the relation of IP (mostly centering around IT or IS) to business strategy. Following these two conceptions, information strategy is the part of business/competitive strategy that relates to IP. In the last three conceptions (the second group), information strategy is defined as a strategy in its own right that exists separately from business strategy (see Figure 9 for a simplified visualization of the core differences of the two conceptions).

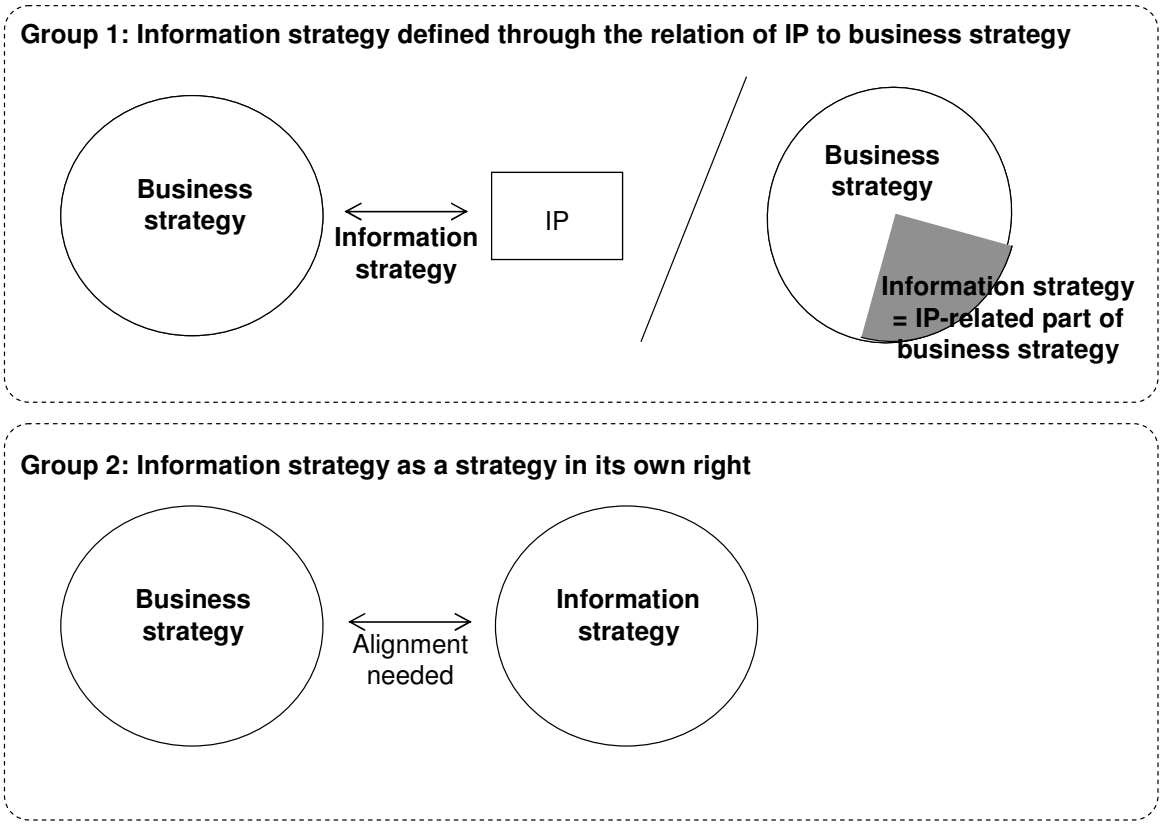


Figure 9: Information strategy as part of business strategy or as a strategy in its own right

This difference has implications for theories that make use of the information strategy construct. In particular, strategic IT alignment theory (Henderson and Venkatraman 1999) can actually only be applied if information strategy is understood as a strategy in its own right. Only the separation of information strategy from business strategy calls for the alignment of both strategies in the original sense. If information strategy decisions are part of business strategy, alignment is inherent: the question "How can IT support business strategy?" cannot be answered without considering alignment with business strategy.

2.4.2 Differences in reasoning and content

Beyond viewing information strategy as a strategy in itself or as part of business strategy, there are other characteristics shared by the conceptions in each of the two groups.

The two conceptions "using IT to support business strategy" and "using IT to gain competitive advantage" rely on established business strategy concepts and theories from management studies, respectively. This provides accepted reasoning for the content proposals. In other words, the underlying theories provide backing for the claim that the respective decisions are strategic and should hence be part of an information strategy. In contrast, the last three conceptions do not rely on established theories from management studies.

Information strategy conception: information strategy as …	**Information strategy content**	**Reasoning**
… the use of IT to deliver business strategy	Selection of information systems that support a given business strategy/objectives	Support a given business strategy
… the use of IT to gain competitive advantage	Selection of strategic information systems (SIS) Selection of IP resources that are strategic (valuable, rare, not imitable, etc.) or that act as barriers to the imitation of a competitive advantage, either by themselves or in combination with other (non-IP) resources.	Support gaining and sustaining competitive advantage

Table 13: Information strategy content and reasoning in the first two conceptions

Unlike the first two conceptions, the other ones (information strategy as a separate strategy) are more detailed on the content, but often lack underpinning with reasoning. These conceptions do not rely on well-established strategy concepts and theories from management studies; instead, unique concepts have been created. But so far, these concepts have received relatively little theoretical grounding. The implication for research is that within these conceptions of information strategy, much more work on theory-generation is required. Also, the information strategy content in these conceptions usually stays on the level of decision areas (e.g. the application portfolio, IT architecture, etc.) – i.e. IP elements or groups of IP elements – that require strategic decision-making. What the exact strategic decisions should be is not the focus of these works. Table 14 summarizes the implications for information strategy content and reasoning as derived from the second group of conceptions.

Information strategy conception: information strategy as …	**Information strategy content**	**Reasoning**
… a plan for all IP elements	Decision areas that comprise IP elements; what the decisions within these decision areas are depends on the structure applied; (e.g. IS: application portfolio, IT: IT architectures, IM: functional issues)	IP elements need to be planned strategically (to affect long-term performance or avoid loss of control)
… a functional strategy	Decisions on functional/departmental issues, including its	Every department needs

	mission and objectives, as well as on all the resources needed to fulfill them (human, financial, technical, etc.)	a strategy; need to run department as a business within a business
… the principal tenor towards IP	Choice of tenor towards IP (role and significance of IP or direction for the use of IT)	Gives direction for all subsequent IP decisions

Table 14: Information strategy content and reasoning in the last three conceptions

From these tables, it is evident that the different conceptions emphasize different decisions as part of information strategy. In other words, the answer to the question "What constitutes an information strategy, i.e. what is its content?" depends very much on the conception of information strategy being followed.

2.4.3 Other aspects of strategic IP decisions

The different conceptions also draw the attention to different aspects of strategic IP decisions. The first conception alludes to a positive relation of strategic IP decisions to strategic business decisions: strategic IP decisions are supportive of business strategy decisions. The second one implies that strategic IP decisions generate a certain impact regarded as strategic, namely competitive advantage. The third conception focuses very much on the different IP elements as objects of the strategic IP decisions. The fourth conception emphasizes the organizational level on which strategic IP decisions are made. Finally, the fifth conception stresses the coherence and guiding characteristic of strategic IP decisions.

* * *

Table 15 summarizes the discussion of the different conceptions of information strategy.

Conceptions	**Information strategy defined through the relation of IP to business strategy**		**Inf. strategy as a strategy in its own right**		
Inf. strategy as...	*… the use of IT to deliver business strategy*	*… the use of IT to gain competitive advantage*	*… a strategic plan for the whole IP domain*	*… a functional strategy*	*… the tenor towards IP*
Theoretical backing	Strategy concepts and theories (MBV, RBV) from strategic management studies		Concepts original to IS research are created; less theoretical grounding so far		
Implications for research	Because information strategy decisions cannot be made independently of business strategy, there is an intrinsic alignment		Because information strategy decisions can be made independently from business strategy, an explicit alignment is needed		
Stressed aspects of strategic IP decisions	Relation to business strategy (strategic IP decisions support business strategy)	Competitive impact (competitive advantage)	IP decision objects	Organizational level (functional level)	Coherence through a consistent attitude towards IP

Table 15: Summary of information strategy conceptions and their differences

We identified different content and reasoning of information strategy from literature. So far, these conceptions are only constructs used by researchers. Nothing has been said explicitly about the relevance of these conceptions in practice (e.g. which conception do practitioners follow? However, most probably, researchers assume that practitioners follow their conception). The next section looks at those articles in our research base that employed their conception in empirical work. This will give us a first hint of information strategy in practice.

2.5 EXTANT RESEARCH ON INFORMATION STRATEGY IN PRACTICE

Of the articles we identified in the literature analysis, slightly fewer than 50 percent had empirical content from practice. Of those, not a single article was devoted to researching the practitioners' original understanding and thinking vis-à-vis information strategy. Instead, all of the articles applied one of the conceptions described in the previous section.

As stated before, most of these articles answered questions other than "What are the content and reasoning of information strategy in practice?" For example, empirical articles following the first two conceptions instead answered the question of how the use of IT has supported business strategies or how it has led to competitive advantage in practice.

Hence, only a handful of the articles provide results that shed light on information strategy content in practice. Furthermore, the appropriateness of the findings following from this kind of research has to be considered warily for the following reasons: first, although there are

multiple conceptions of information strategy in academia, we don't know which ones are used in practice. Simply assuming that the conception promoted in a given article is also prevalent in all companies in practice is a dangerous leap. Secondly, the conceptions of information strategy content in academia are mostly not well reasoned. The authors of the articles generally do not provide adequate reasons for choosing one conception over another. In this respect, their choices seem to be random.

Despite these shortcomings, the academic findings up to now should still be looked at, even if we know that they have to be considered warily.

The findings of extant research cover three broad issues: first, the findings confirm that information strategies exist in practice. However, not all companies have information strategies. Practitioners' own understanding of information strategy also seems to differ to a large extent from researchers' understanding. Second, certain findings indicate that some practitioners perceive information strategy as a functional strategy, but that this is a minority view. Many practitioners seem to view information strategy as a way to gain competitive advantage. There are indications (though not representative) that practitioners do not use models proposed in academia that follow the conception of information strategy as a plan for the whole IP domain. Thirdly, we see that not all decision areas are accorded the same importance in information strategies and that there is no consensus on which ones are important. We neither learn why the decisions are considered strategic in practice nor in which circumstances. These findings are detailed in the following paragraphs.

2.5.1 The existence of information strategies in practice

Following our argumentation for the relevance of SIP in general and information strategy in particular in Chapter 1, it is self-evident that practitioners deal with information strategy (otherwise, it would be difficult to explain why the topic is ranked among the top concerns of IT executives for many years now (e.g. Galliers 1993b; Luftman et al. 2006; McGee et al. 2005; Watson et al. 1997).

Hence, it is not surprising that studies confirm that it is common to have an information strategy in practice. For example, Wilson (1989) found that almost three fourths of the UK's Times 500 companies claimed to have an information strategy. In financial services companies in the UK, 85% made the same claim. However, if adhering closely to his own characteristics of an information strategy and the planning process ("formally documented […] initiated by the Board […] monitored by planned reviews […]"), the figure drops to 13% (from 75%!) for Times 500 and 22% for financial services companies.

These results demonstrate two aspects: first, not all companies seem to have an information strategy. Second, we have to be careful with the answer to the question of whether an organization has an information strategy or not. The authors of empirical studies use certain conceptions of information strategy. These conceptions not only differ from author to author, as we demonstrated in Section 2.3, but also seem to differ from the ones used in practice: the vaguer information strategy is defined, the more practitioners agree to have an information strategy. Apparently, practitioners seem to view different decisions as part of information strategy than the researchers of the studies (otherwise there would not be such an immense drop as reported in the study). This confirms our earlier statement made in Chapter 1 about the gap between research and practice with regards to information strategy content. Hence, the resulting question (which is not answered by the extant empirical studies sufficiently) is: What exactly is the content of information strategy in practice and why do practitioners care about exactly this content? We deal with this question in Chapter 3.

2.5.2 Conceptions used among practitioners

As in the research literature, a number of conceptions seem to be employed in practice. However, there has not been any research aimed at identifying what these are. Up to now, researchers have instead (implicitly) relied on their own conceptions. Hence, we can only reconstruct the findings of different works with the caveat that their results might not actually jibe with reality.

In practice, information strategy is sometimes perceived as a functional strategy. However, this view is not necessarily widespread. For example, Wilson (1989) reports that around 6% of the UK Times 500 companies that have an information strategy state that "information systems strategy is a departmental function, rather than a corporate function." Codington and Wilson (1994) report that of the insurance firms in the UK possessing an information strategy, 9% perceive it as a "departmental matter." Whether the "departmental matter" status means that the information strategy is considered a functional strategy remains unclear, however. Conrath et al. (1992, p. 376) find that information strategy in Canadian organizations is developed "from an IS rather than a corporate perspective." While not directly supported by their survey data, they "expect to find that virtually every department develops their strategy from an internal perspective [due to…] organizational politics." We might interpret this as an indication that they also expect information strategy to be understood as a functional strategy in organizations.

Practitioners do not seem to follow the most prominent models proposed in academia within the conception "information strategy as a plan for the whole IP domain." At least this is is confirmed by earlier research reporting "differences within and between organizations, but particularly in comparison to the academic literature" (Brady et al. 1992, p. 183). Referring to Earl's model of IT, IS, and IM strategy, Brady et al. (1992) state that "[w]hile it is useful to distinguish between these different types of information strategy, the research reveals that delineating between the three is infrequently done by organizations" (p. 187). For one UK metropolitan council, Flynn and Hepburn (1994) found major deviations between their "reference model" (based on an earlier version of the one proposed in (Ward and Peppard 2004)) and practices in the case company. These findings support the claim made in the introduction, namely that there is a disconnection between research and practice with respect to information strategy conceptions. On the other hand, practitioners find it possible to respond to questionnaires that present information strategy as a mere "list of issues" (Conrath et al. 1992; Wilson 1989), which indicates that there are certain overlaps though. The findings also demonstrate the prevalent approach to empirical research in the field of information strategy up to now: despite the fact that the proposed models are not well reasoned and do not find wide support in practice, they are nevertheless used in research and assumed (despite evidence to the contrary) to be the conceptions that practitioners actually use. What becomes clear is that at this stage of research, it is much more sensible to investigate how practitioners understand and what they subsume under information strategies (which we do in the next chapter).

2.5.3 Content of practitioners' information strategies

A few articles conducted surveys that asked practitioners to rank the relevance of a given list of decision areas assumed to be part of information strategy. Unfortunately, none of these articles explain the decision areas in detail; they merely provide names for the areas.

The studies present a heterogeneous picture with no obvious conformity among decision areas, which makes it difficult to identify the dominant elements of an information strategy (see Table 16 below).

Decision areas	Priority ranks of decisions by source				
	(Conrath et al. 1992), similar in (McLean and Soden 1977)	(Wilson 1989)	(Flynn and Hepburn 1994)	(Brady et al. 1992)	(Bajjaly 1998)
IT function objectives	1	7‡			X
Role of IT / IT unit			X	X	X
Technology trends to watch	3/9**				
Plan for HW/IT resources	2	3		X	
Plan for IS (portfolio, ranked list)	5	1,2,5,8 ***		X	
Plan for financial resources	6				
Plan for human resources	7	8‡‡			
Plan for education	11	8‡‡			
Organizational plan	10		X†	(X)††	X†††
Plan for facilities	8				
Plan for implementation of strategy	4				X
Industry trends to watch	12*				
Strengths and weaknesses of staff	13*				
Strategy review results	14*				
Alternative IT strategies	15*				
Overall IT architecture (data, applications, technology) and standards		4		X	
Standards only			X	X	
Vendor policies				X	

Table 16: Items tested for their importance in practitioners' information strategies

Legend for Table 16:

- * Fewer than 50% of respondents actually included this item in their information strategy
- ** Survey differentiated between various application domains of IT
- *** Survey differentiated between different types of IS
- ‡ Specific goal mentioned: improved efficiency
- ‡‡ "Development of appropriate staff resources"
- † Creation of decision committee (governance mechanism)
- †† Wide difference noted among organizations
- ††† 40% of respondents included assignments of responsibilities and reporting mechanisms (governance)

2.5.4 Purpose of information strategy in practice

We found only one article (Teo and Ang 2000) whose title ("How useful are strategic plans for information strategy?") indicated some sort of reasoning vis-à-vis information strategy. In fact, it looked at "the usefulness of IS plans through a field survey of 136 IS executives" (p. 275) in Singapore. The questionnaire sent out by the researchers is based on "literature on

IS planning" rather than strategic planning. There is no mention of how a "strategic" IS plan differs from an ordinary IS plan. Indeed, the two terms are used interchangeably in this article. The given definition of a strategic IS plan suggests a "portfolio of computer-based applications that will assist an organization in executing its business plans and consequently realizing its business goals" (p. 275). Hence, the article really refers to only one decision (which is assumed to constitute the whole IS plan), namely "which applications should be developed to support organizational objectives." Again, we do not know whether practitioners actually view this decision as strategic or if they view any other decisions as strategic.

The article presents the supposed purposes of these "IS plans" as ranked by practitioners. The results are shown in Table 17 (Teo and Ang 2000, p. 277).

Rank	Purpose: To …	Rank	Purpose: To …
1	Better support business objectives	11	Facilitate managerial control
2	Improve systems integration	12	Facilitate communication with users
3	Better exploit IT for competitive advantage	13	Facilitate integration of diverse functions
4	Prioritize IS development projects	14	Improve co-ordination of decision-making
5	Improve top management support for the IS function	15	Identify new opportunities
6	To facilitate better system investment decisions	16	Motivate managerial action
7	Improve resource allocation	17	Clarify the role of IS
8	Forecast resource requirements	18	Evaluate IS performance
9	Facilitate communication with top management	19	Anticipate surprises and crises
10	Identify key problem areas	20	Adapt to unanticipated situations

Table 17: Purposes of the application portfolio

In support of the relative importance of gaining competitive advantage (rank 3), (Wilson 1989) finds that almost 90% of Times 500 companies claimed that "CA [competitive advantage] was a feature of their IT strategies." Other researchers (Brady et al. 1992) agree that companies focus on gaining competitive advantage through the use of IT, but cannot sustain the advantages. They find that banks are so eager to gain competitive advantages through IT that they frequently run into "arms races" that no competitor can win (Brady and Targett 1995a).

* * *

Summarizing the extant research on information strategy in practice, information strategy is a topic of concern in practice. However, practitioners perspective on information strategy seems to differ from the perspective in academia. Unfortunately, we have not learned much about the practitioners' original thinking, because research so far has only applied selected concep-

tions implicitly rather than trying to tease out the practitioners' own understanding. We also do not know much about the practitioners' reasoning, i.e. why they regard certain decisions as strategic. It is therefore necessary to conduct primary empirical research, which is presented in the next chapter.

3 PRACTICE PERSPECTIVE ON INFORMATION STRATEGY

The previous chapter identified content elements of information strategy by analyzing the proposals that have been made regarding information strategy and its content in academic literature. The indications for differences between practitioners' and researchers' perspective on information strategy lead us to conclude that it is necessary to understand what practitioners understand as the content of information strategy. Hence, this chapter looks at what practitioners argue to be the content of information strategy. The question addressed here is "Which IP decisions do practitioners consider as part of information strategy and why?" The answers are obtained by conducting original empirical research in practice.

3.1 EMPIRICAL STUDY ON INFORMATION STRATEGY IN PRACTICE

The shortfalls of extant research mean that we cannot rely solely on the literature to fulfill our research objective. Missing from it is an understanding of the practitioners' own thinking on the content and reasoning, which contribute to an empirically valid proposal for information strategy content. Thus, the approach taken in the second step of our study comprises an original investigation of practice. This section describes the assumptions underlying this investigation and the methodology used, followed by the findings.

3.1.1 Assumptions and methodology

All of the studies mentioned in the previous section took a positivistic approach that started with a given construct or at least with a "list of issues" derived from the literature to test the extent to which practitioners followed them. The use of the term "reference model" (Flynn and Hepburn 1994) describes very well which function the constructs serve in this context. This approach is limited in its capacity to really explain the practitioners' thinking. And despite the indications that practitioners do not seem to follow these models, no one has made the effort to find out which models practitioners *do* follow. However, researchers agree that understanding practitioners' thinking or cognition is "far too critical to be ignored as it can impact on IS outcomes" (Tan and Hunter 2002, p. 39). They even argue that if the practitioners themselves had a better understanding of other stakeholders' thinking, more successful IS outcomes could result (Orlikowski and Gash 1994). This notion has also been proposed for the field of strategic management (Dutton et al. 1989; Walsh 1995).

Hence, the approach taken here is theory-independent (Cropley 2005), qualitative (Cropley 2005; Miles and Huberman 1994) in an interpretive manner (Klein and Myers 1999; Orlikowski and Baroudi 1991). That means that we will not rely on (information) strategy theories of or proposals for information strategy from research literature (see Chapter 2) to test them in practice. As indicated in Chapter 1, practitioners might consider completely different IP decisions to be strategic and for very different – but still valid – reasons. Their reasoning is neglected in an approach that only tests existing content and reasoning.

To explore and really comprehend the "what's" and "why's" of information strategy concepts (i.e. content and reasoning) used in practice, a qualitative approach is more suitable than a quantitative approach (Cropley 2005, p. 37, p. 49; Miles and Huberman 1994, pp. 5). Following a qualitative track allows us to obtain deep insights into practitioners' understanding of information strategy. Face-to-face discussions yield far more insight into their understanding, use, and reasoning of information strategy than quantitative surveys. In using a qualitative approach, we are following other researchers (e.g. Brown 2004; Hackney and Little 1999), who state – again, with an eye towards the current situation in research – that "it may be appropriate for more theory-generating research to be conducted, employing qualitative techniques […]" in the field of SIP (Brown 2004, p. 27).

Our idea is to capture the understanding of practitioners in an interpretive manner (Klein and Myers 1999; Orlikowski and Baroudi 1991). This helps to "understand phenomena through accessing the meaning that participants assign to them" and to "understand the deeper structure of a phenomenon" (Orlikowski and Baroudi 1991, p. 5). Accordingly, we do not impose our own a priori understanding (nor any other expressed in the form of a theory[22] or construct) of information strategy on the practitioners. It is not *our* content that we wish to test and not *our* reasoning that we intend to verify. Rather, we allow the practitioners to elucidate *their* own understanding of information strategy in terms of their decisions and reasoning processes.

The assumption that the practitioners' actions are guided by their own thinking is backed by Kelly's personal construct theory (Kelly 1955) and Argyris' "theories of action" (Argyris and Schön 1974). Kelly uses the analogy of "man as scientist" because people are perpetually building and working on theories and models about how the world works. Argyris views "deliberate human behavior as the consequence of theories of action held by humans" (p. 5). Without delving too deeply into psychology and overstretching similarities, the assumption

[22] Hence, Cropley (2005) calls this a theory-independent approach in contrast to a theory-testing approach.

we borrow from these works is that practitioners have their own "theories" vis-à-vis which IS decisions are strategic and why. It is important to understand practitioners' perspectives on information strategy because it underlies practitioners' and organizations' understanding ("sensemaking in organizations begins with the personal perspectives individuals use to understand" (Tan and Hunter 2002, p. 40)) and eventually their actions (Weick and Bougon 2001). Hence, the assumption is that it is possible to better understand organizational cognition (or thinking) and hence organizational action by understanding individually held perceptions (Weick 1995; Weick 2001). Individual thinking becomes "the foundation […] of how organizations work and how people within organizations achieve shared action" (Jelinek and Litterer 1994, p. 33). However, we believe there is one caveat to this assumption: individuals' understanding can only contribute to organizational understanding (and eventually organizational action) if these individuals (can) share their understanding and have the means to influence other stakeholders' thinking.[23] This has to be (and was) considered in the sampling approach.

Understanding the actions of organizations thus requires understanding their stakeholders' thinking. This is a prerequisite for improving organizational action (Argyris 1976; Argyris and Schön 1974; Tan and Hunter 2002). Conversely, maybe these theories of action can help to advance the understanding of information strategy in research, especially in the absence of better ones in academia at this time (compare current proposals from the research literature in Chapter 2).

Another assumption we borrow from these theoretical works is that "If you don't know what is proceeding inside a person, then ask him; he will tell you" ((Pervin 2000) citing Kelly (without source)).[24] To allow practitioners to elaborate upon their thinking, we used open, non-standardized, qualitative interviews for data collection (Mayring 1996, p. 49). For the data analysis of the transcribed interviews, we used qualitative content analysis (Mayring 1996; Mayring 2003).

[23] We interpret the statement that "personal constructs can be shared to a greater or lesser extent" (1986, p. 179) in this sense. The sampling has to ensure that the constructs of the chosen individuals are likely to be shared to a greater extent.

[24] We agree with this, but add the caveat that people might not be able or willing to tell the "truth." See our measures below employed to counteract this phenomenon (called espoused theories and theories-in-use by Argyris (1976)).

3.1.1.1 Data collection

We collected the data for answering the research questions from practice in 13 interviews with practitioners in different organizations. We first describe the sampling of interviewees and then how we conducted the interviews so that other researchers can retrace our conclusions.

3.1.1.1.1 Sampling

For the interviews, we chose practitioners who could be expected to provide deep insights into information strategy. We wanted the interview partners to be practitioners who have dealt with strategic IP decisions not only marginally. They should deal with information strategy as one of their core tasks and hence have devoted much thinking to it. These people did not necessarily have to be top managers; individuals responsible for preparing top-management decisions, lead meetings or workshops on information strategy discussions, etc. are potentially even more suitable for our purposes. Selecting knowledgeable interviewees is important for our research because personal constructs and theories are built through experience (Kelly 1955). Hence, people without much experience in developing information strategies are unlikely to have a well-developed understanding and would not be able to provide rich input.

We were aware that more than one person might participate in developing an information strategy (cf. Smits and van der Poel 1996) and that each participant might have a different understanding. Hence, our sampling strove to ensure that the selected individuals' understanding had a high likelihood of being shared within the organization and hence of influencing others' understanding (see section above). This criterion was in line with our assumption that personal thinking influences organizational action.

To find such interviewees, we looked for people who had presented their organization's information strategy at conferences, published the strategy elsewhere, or formally held titles such as "Head of IT strategy." The sampling was therefore deliberately not random. This approach certainly restricts the generalizability of the results but is not without advantages. The decision to select the interviewees in this way was based on several assumptions: first of all, it provided evidence that the company in fact had an information strategy. Individuals who have presented their organization's information strategy will have dealt with it extensively and apparently seem to think it is worth publishing, which usually indicates that the practitioners think it is a successful information strategy in certain respects. As companies often require sign-offs for external communications in their name, the official strategy is what is portrayed in publications and presentations, not merely the wishful thinking of the individual practitio-

ners. By presenting the strategy to other practitioners, these "ambassadors" are likely to shape the understanding of other practitioners beyond the borders of the organization. Hence, the chosen interviewees might even be expected to represent a whole group of other practitioners that has adopted their understanding. Hence, these practitioners could be described as "evangelists" for their organizations in both an internal and external capacity, a role that serves to fulfill the above-mentioned criteria. The veracity of this claim was demonstrated in a number of cases. To illustrate, in case 4, the interviewee had conducted several company-internal "town hall" meetings to explain the company's information strategy to staff:

> "Es trifft sich insofern ganz gut und ist ganz witzig, als wir z.B. gerade gestern Abend eines unserer sog. Townhall Meetings hatten, wo wir vom oberen Management aus regelmäßig informieren […] [ich] lege ich Wert drauf, dass die Leute verstehen, was ist eigentlich eine IS Strategie, welche Komponenten hat sie und […] welchen Feldern ist Arbeit zu machen […] Das ist nicht ne einmalige Geschichte, sondern wir hatten vor 3 Monaten auch ein All-Staff Meeting. […] das ist sehr sehr wichtig glaube ich, dass die Mitarbeiter einen bestimmten Rahmen haben, an dem sie sich alle halten und deshalb versuche ich diesen Rahmen in die Köpfe zu nageln, seit 1,5 Jahren, weshalb auch dieser Rahmen immer mal wieder auftaucht. Der taucht immer mal wieder auf."[25]

In our sample, we were successful in choosing people with oversight of information strategy development within their organizations. Even if they were not the sole participants in information strategy development, they still knew which decisions were made and by whom. The chosen practitioners were all IT managers, at least one level below the board level. As stated above, we did not find it necessary to talk to the highest managers; we wanted to interview those people actually spending significant amounts of time on information strategy.

The exclusive use of IT managers as interview subjects might be regarded as a bias in the sample. However, this choice does not seem to be unusual: according to a study by Deloitte Consulting, only 14% of companies involve board members in information strategy discussions (NN 2007). Other researchers found that information strategy is primarily driven by the IT department (Flynn and Goleniewska 1993). Still, we have to be careful about transferring

[25] Translation by author: "It fits pretty well and is kind of funny, because just last night for example we have had one of our so called 'town hall meetings' where we from upper management regularly inform [staff …] [For me] it is important that people understand what an IS strategy actually is, which components it has and […] in which areas we have to do something […] This is not a one-off thing, just three months ago we have also had an all-staff-meeting […] it is very, very important, I think, that the employees have a certain framework on which they can rely and therefore I have been trying hard to get that framework into their heads for already one and a half years now, that's why this framework pops up once in a while. It keeps popping up."

the findings to situations in which this is not the case. Another potential bias might be in the size of the companies in terms of revenue: all of the companies examined in this study are relatively large in this respect.

Another requirement that drove our sample was to vary one of the probably most obvious situational factors, namely industry. To generate the variety that might help to obtain a comprehensive picture of information strategy in practice, we decided to include practitioners from organizations in diverse industries in the sample.

Most of the interviewees were brought on board without our having had any prior contact with them. We looked for potential candidates by scanning the presentations of related practitioner conferences (e.g. "Strategisches IT-Management 2005" by Handelsblatt) and practitioner books (e.g. Bernhard et al. 2003) in which practitioners had published at least one chapter on information strategy. We contacted those practitioners whose presentation or chapter contained the words "information strategy" or a related term (see Chapter 2) in its title or in its short description/abstract. We also selected people whose titles indicated responsibility for information strategy (e.g. "Head of IT Strategy"). We also searched the World Wide Web with google.de for these kinds of titles. After having obtained the e-mail address of a potential interviewee, we sent a request for participation in the research to the individual. The request is printed in the Appendix A.

A few selected candidates denied our request for participation due to a lack of time or – in one case – confidentiality issues. But, the overall response was very positive. The candidates were open and willing to discuss their company's information strategy with us. In no case did we detect any reservations or hesitation to speak about the topic.

The sample is shown in Table 18. A brief description of each company is found in Appendix B.

Industry	Revenue[26] p.a.	Title of participant	Organization of IS	Location of IS strategy planning
1. Insurance	2 bn. EUR	Director IT Strategy	Sub-unit of "Accounting & IT"	Staff unit within IS department
2. Insurance	1 bn. EUR	Director IT Development	Main department	IS department
3. Health care	4 bn. EUR	CIO	Profit center unit	IS department
4. Public institution	n/a[27]	Director Information Systems	Main department	IS department
5. Telecommunications	50 bn. EUR	VP Corporate-IT-Management	Profit center unit & distributed across business units (BUs)	Corporate unit
6. Investment bank	24 bn. EUR	Director IT Department	Main department	IS department
7. Logistics	17 bn. EUR	Head of IT	Profit center unit & distributed across BUs	Staff unit within globally distributed SBU
8. Universal bank	320 bn. EUR	Deputy Head of IT Strategy	Profit center unit & distributed across BUs	Corporate unit
9. Public transportation	n/a	Head of IT Strategy	Profit center unit & distributed across BUs	Corporate unit
10. Pure online bank	48 mio. EUR	Head of IT strategy	Fully outsourced, only two staff members remaining	Head of IT strategy
11. Aviation	23 bn. EUR	Head of IT strategy	Profit center unit & distributed across BUs	Corporate unit
12. Home loan bank	1.4 bn. EUR	CIO, Head of Process and IT Management, Director Organization	Main department	IS department
13. Manufacturing-ceramics	1 bn. EUR	CIO	Main department	IS department

Table 18: Research sample

[26] 2004 figures: premium income for insurance, assets under management for investment banks, credit volume for banks.

[27] Supra-national, public administrative body.

We stopped after the thirteenth case as we had not found any new decisions proposed for the content of information strategy. According to our grouping of decisions into decision areas (see section 3.1.2 for how we build the decision areas), we did not discover any new decision areas after case 6 (see Table 19). While this is no evidence for completeness (there is no guarantee that we would not have found further decisions in a fourteenth case), it at least indicates that we had discovered the most common decisions of information strategy within the limitation of our sample.

Case	1	2	3	4	5	6	7	8	9	10	11	12	13
No. of decision areas identified (cumulative)	1	5	7	10	11	12	12	12	12	12	12	12	12

Table 19: Cumulative number of decision areas identified in sample

3.1.1.1.2 Conducting the interviews

We conducted open interviews (Cropley 2005). This means that there was no standardized set of questions that was asked in each interview. Instead, each interview took a different route depending on what the interviewee emphasized. This format allowed us to better concentrate on those aspects of information strategy that the interviewee thought of as being central. The open interview is meant to let the participants speak their minds (Mayring 1996, p. 1). In fact, the interviews were more a discussion than merely questions followed by answers. Hence, it is not possible to describe a structure for how each interview was conducted. The questions asked were very much dependent on what the interviewee said. However, even in an open interview, the interviewer has to ensure that what is discussed is relevant to the research objective. In our case, we had to focus on IP decisions and the reasons why these decisions were regarded as strategic. But we did not pre-specify what the decisions or the reasoning might be. The research questions helped to keep the interviews focused on the relevant topics.

A number of issues had to be taken into account when conducting the open interviews. On the one hand, the concept of theories of action sensitized us to the difference of "espoused theories" – i.e. those communicated by practitioners when asked – and "theories-in-use" – i.e. those actually underlying their behavior: "When someone is asked how he would behave under certain circumstances, the answer he usually gives is his espoused theory of action for that situation. This is the theory of action which he […] communicates to others. However, the theory that actually governs his actions is his theory-in-use, which may or may not be compatible with his espoused theory" (Argyris and Schön 1974, p. 7). There is always a danger of confusing espoused theories with theories-in-use. Theories-in-use can neither be inferred strictly from behavior (e.g. because a person may hold a theory but may not be able to apply

it) nor from discussion alone (e.g. because of tacit knowledge) (Argyris and Schön 1974, p. 10).

We dealt with this difference in two ways during the interviews: first, we were aware that we could not ask the interviewees directly about their "theory" or understanding of information strategy (such as "What is your understanding or definition of information strategy?"). Instead, we asked which IP decisions they consider strategic and why. At this point, we asked for actual decisions and concrete examples thereof rather than about hypothetical situations. Second, we tried to complement the interviews with information strategy documents or presentations. We let the individual confirm (or checked ourselves) that the stated decisions were also found in an actual information strategy document (or in presentations) wherever possible. Hence, from a mixture of interviews (discussion) and referrals to documentation (manifested behavior), we tried to approximate the theories-in-use.[28]

We started the interview with an open question about the "general background of the company." Usually, this got the interviewee talking about the company, and the discussion very quickly turned to the firm's information strategy. If not, we asked "Which IT-related decisions were strategic in the company?" This eventually led the interviewee to talk about the content of information strategy. Often the participants even used parts of the information strategy document to guide and structure their talk. If they did not do so, we asked whether there were official documents or presentations that contained references to the decisions they talked about.

When an interviewee stopped talking, I tried to encourage him to continue, e.g. by asking whether there were any other strategic IT decisions. I then followed up by asking "Why were these decisions regarded as strategic?" hoping to uncover his reasoning process. We also asked whether the mentioned decisions had always been the same or whether there had been past information strategies that had had different content and why. Finally, we summarized the decisions and the reasons for their being considered strategic in order to check whether we understood the interviewee correctly. Each interview lasted between one and two hours.

The interviews were conducted in the office of the respective interviewee, except for two interviews (cases 5, 8) that were conducted over the telephone.

All interviews except one were digitally recorded with the permission of the interviewees. In case 12, I made notes during the interview and wrote a memorandum two hours after the in-

[28] The reader should be aware that our focus is on information strategy. Whether such plans actually get implemented is beyond the scope of this work.

terview summarizing and organizing the notes into structured minutes. Although recording the interviews might have potentially inhibited the interviewees from talking openly, especially about a sensitive topic such as information strategy, the recordings nonetheless enabled a more detailed analysis. As the recorder was the size of a slim mobile phone and was not the only item on the table, we felt confident that it did not distract the interviewee. In fact, all of the interviewees were very candid during the interview, sometimes even starting their sentences with "I shouldn't tell you this, but …" (e.g. case 4).

All interviews were conducted in German, the native language of both the interviewees and ourselves. Using German facilitated openness and precision of expression much better than if a foreign language had been used. In order to work with the original statements as closely as possible, the transcription were not translated into English. Only those statements that are quoted in the body of the thesis were translated in English; the original quotes in German can be found in the tables supporting the analysis.[29]

3.1.1.2 Data analysis

The recorded interviews were transcribed by a professional service firm that had signed a confidentiality agreement. The transcriptions were checked by the author of the thesis and a second person[30] for correctness. The rules set for the transcription conformed to the ones presented in Mayring (2003, p. 49). The transcription firm was instructed to transcribe literally (word by word) but to leave out filler words like "um," to use "…" for unintelligible passages that were later completed by us, and to precede our statements in the interview with (F) and the interviewee's statements with (A).

The transcribed and verified interviews were then analyzed according to the method of qualitative content analysis (Mayring 1996; Mayring 2003). This method was chosen because qualitative research has been accused for being unsystematic (Mayring 2003, p. 10, p. 27). Several authors talk about the "art of interpretation" (Mayring 2003, p. 27, citing Schleiermacher). However, Mayring's method of qualitative content analysis is a more systematic approach. It has been said to be useful for "determining the outline of the research object in its context, for demarcating it from other objects and for the general characterization of its inner composition" (Rust 1981, p. 196; translated by myself). This quote describes our intentions

[29] All transcribed interviews and minutes were made available electronically to the supervisors of this thesis. Due to the enormous number of transcription pages (more than 200), we did not attach them in written form to this document.

[30] Mr. Alexander Pellengahr, at that time a Master of Science in IS student at the University of Muenster, performed this task.

regarding information strategy and its content. In addition, qualitative content analysis emphasizes the use of systematic techniques, which allows for more intersubjective verification.

In more concrete terms, using this method required us to go through each interview (intra-case-analysis) and look for statements on information strategy content and reasoning. In this sense, the high-level code categories (decisions and reasons) were already given. We coded these parts of the interviews first using Atlas TI, but then switched to using the simple spreadsheet function of Microsoft Excel, because Atlas TI was not able to produce overviews in tabular form, which would have prevented us from comparing across cases. Excel proved to be sufficient for our analysis. In order to increase inter-coder reliability, we had another person do the intra-case coding independent of our coding (the same person checking the interviews was used). The results are found in (Pellengahr 2006). Afterwards, we compared the codings and discussed the differences. Although this was not set as a goal, we were able to agree on one of the codings for each difference through discussion.

In order to enable other researchers to follow how we came to the findings presented below, we will try to describe how we went about doing the actual coding in some more detail here. As stated above, the unit of coding was any IP decision that was seen as strategic and the reasons given therefore. We identified a decision in two ways: either the interviewee explicity identified it as such (e.g. “we had to make a decision on …,” “we decided to…”) or we determined from the context that the interviewee was referring to our definition of decision, namely a formation of intentions for future action (which might be but is not limited to a choice between alternatives; see Chapter 1). Identifying those places in the transcription was straightforward, as the interview was geared toward content. We put those parts of the transcription into the Excel table with the column heading “decision quote.” We tried to be parsimonious in this column, placing the lengthier quotes in another column titled “context/detail quote.” This latter column provided more space for transcribed quotes that gave more information about the decision and its context. For both quotes – decision and context/detail – we prepared a summary of what was said in our own words and put this in the Excel table next to the respective columns. Our summaries provided an interpretation (every summary using own words is an interpretation) of what the decision was and what it was about. As stated above, the quotes have not been translated as this would have changed the original statements too much. However, the summaries are given in English.

We followed the same procedure for the reasons given for a decision being strategic. Again, finding quotes that referred to the reasoning behind the decision was not difficult, as these

were often preceded by the question similar to "Why is this strategic?" Otherwise, we looked for statements that referred to any kind of reasoning (from sign, analogy, cause or generalization (Toulmin et al. 1984)). Again, we summarized the statements with our own words in another column.

Having done this separately for each interview, we put the tables for each interview together in order to group them into similar decisions (inter-case analysis). The results of this inter-case analysis are described below.

3.1.2 Findings: Information strategy content and reasoning

The following findings present the decisions identified over the course of the interviews as being strategic.

In total, we collected 89 instances of decisions, which we then grouped into 12 decision areas. We arrived at this grouping by first clustering decisions related to the same object (e.g. application, set of applications, technical infrastructure, personnel, finance). However, it became apparent that for our purposes, the object alone would be insufficient for distinguishing the decisions. For example, the decision to exchange a number of applications because of unsatisfactory functionality, the general decision on the use of standard vs. custom-built software, and the decision on which applications to include in the application portfolio are all decisions on a set of applications. However, the nature or kind of decision differs fundamentally: the first decision is about functionality, the second is about standards as rules, and the last one is an investment decision. Hence, by combining both the object and nature of the decisions, we identified 12 decision areas:

a. Application landscaping decisions: concern the functionality of a set of applications
b. Application systems standards: concern rules for a set of applications
c. Technical architecture standards: concern rules for a set of technologies
d. Process standards: concern rules for a set of IP activities
e. Investment portfolio decisions: concern the commitment of financial resources to a set of concrete IS/IT based initiatives
f. Budgetary decisions: concern the allocation of financial resources to a set of business units/cost categories for them to make investment decisions
g. IS/IT projects that support market activities: concern the commitment to individual projects with the intent of supporting market activities such as introducing a new product

h. Human resources (HR) and organizational plans of the IT unit: concern the organization of a set of activities and the people conducting these activities

i. Role of the IT unit: concerns the demarcation of the scope of an organizational unit

j. Rights and accountability: concern the internal allocation of responsibilities for decisions

k. Sourcing decisions: concern the external allocation of activities

l. IT security and continuity: concern the rules for avoiding negative impacts on the company through IT incidents or shortcomings

These decision areas are described in detail below along with the reasoning provided by the interviewees for deeming the decisions within the area strategic.

a. **APPLICATION LANDSCAPING DECISIONS** are related to the functional scope and composition (in contrast to the technical design) of the current or future set of applications as a whole. Decisions vis-à-vis the application landscape entail looking at a blueprint, i.e. a holistic view of the applications required to support business processes. In this sense, the application landscape is closely related to the processes supported by applications. Decisions within this area aim at answering the question of which applications are needed or need to be changed in order to support the business: "So we developed an IT strategy that was more like a plan for building out IT [Bebauungsplan] – with which solutions do we support the business in order to […] reflect the growth [targeted by the business strategy] […]?" (case 3). The decisions subsumed under this decision area are:

   - Application lifecycle decisions, e.g. in which areas should the application landscape be extended, renovated, or exchanged in the future? (case 2)
   - Decision on which applications or application platforms (e.g. SAP R/3) to use for a certain process area (e.g. accounting, HR, production) or which business processes could be automated (cases 3, 12, 13)

   The reasons given for these decisions being strategic touched on the relation to business strategy, the need to anticipate change, and on the necessity of building "adaptability" into the landscape as well as the decisions' long-term and corporate-wide impact.

   The decision on replacing existing parts of the landscape and selecting new platforms were considered part of information strategy because they **supported the execution of a given business strategy** (cases 3, 12, 13). In case 3, the existing system could neither support the growth in terms of transactions nor the new business requirements stemming

from entering new fields of business. Hence, current applications were an impediment to achieving these strategic business objectives. In case 12, the cost leadership strategy asked for increasing the cost-income ratio. Consequently, the question was which processes could be automated further in order to streamline the costs of business processes.

In contrast, in case 2, the decision for designing the application landscape was argued to be strategic, because the decision-makers know that the environment of the company (in terms of business requirements) will change. Which changes will occur and when is **uncertain** at the point in time when the decision is made. It is also not economically feasible to exchange the systems each time these changes occur. The applications built as an outcome of the decision have a **very long lifetime** of 10-20 years. This tension between long-term durability and change was argued to require designing the landscape in a way that **accounts for these changes in order for it to remain adaptable or flexible** (cases 2, 3).

Decisions on exchanging parts of an application landscape are seen as **long-term plans** because they determine what has to be done in the next 3 years (cases 2, 13). Application landscape decisions are also said to have a **major impact on the whole company**. However, this is merely related to the fact that applications are used across certain regions or business units and hence standardized. This already leads over to the next decision area: application standards.

Table 20 provides a basis for tracking the above-made interpretations for decisions, for mapping them to the decision area, and for tracing the reasoning behind them in that it displays these interpretations alongside quotes from the transcribed interviews that led us to the interpretations (if an interviewee mentioned multiple decisions that we had grouped into the same decision area, we indexed the case number with a letter. For example, if the interviewee in case 4 made multiple decisions, we would refer to them with 4a, 4b in the case column; the numbers in the "quote" columns refer to the line numbers in the transcriptions; the underlined parts of the quotes emphasize those parts that our summary or interpretation was based on).

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reasoning quote	Reasoning summary
2	76: Im Grunde genommen beschäftigt man sich in der IT [Strategie] oder sollte man sich beschäftigen und haben wir eben deshalb auch getan immer mit der Frage: A) […] B) ja was ist eigentlich die richtige Anwendungslandschaft, wie wollen wir sie entwickeln, steuern?	Decision on application landscape	113: wo sind denn die Systeme, die in den nächsten Jahren, Schwerpunkt von Ablösestrategien, von Erneuerungsstrategien sein sollten 214: Typischer Weise ist der Ablauf, der das man eben Bestandsaufnahme der Anwendungslandschaft […] Wenn man da einmal systematisch drüber geht und überlegt wo gibt's […] Erweiterungs-, Änderungs-, Renovierungsbedarf […]Da haben wir wieder eine gültige 3-Jahresplanung.	In which areas should we extend, renovate, or change the application landscape?	112: und das tut man nicht täglich 81: nachhaltiges Wirtschaften […] Wir machen ja nicht IT für den Augenblick, sondern wir wissen, dass alle unsere Systeme, mehr als 10 Jahre Lebenserwartung haben, viele auch 20, auch die, die heute noch gebaut werden. Und selbst bei der Hardware wissen wir, dass die im Minimum vielleicht 4 Jahre, i.d.R. auch eher 7-8 Jahre gilt. [...] ist jede Entscheidung die man trifft unter langfristigen Kosten-Nutzen-Abwägungen zu sehen [...] wie baue ich sie denn am Besten so, dass sie auch wenn sich die Welt drum herum in den nächsten 10 Jahren verändert, immer noch weiter verwenden kann. 224: Da haben wir wieder eine gültige 3-Jahresplanung.	Anticipate change and build "adaptability" into the landscape Is a long-term (3 yrs) plan - what has to be done in the next 3 years
3	34: Und darauf hin haben wir eine IT Strategie gemacht, die sich eher als IT Bebauungsplan eigentlich darstellen sollte, das hieß also mit welchen Lösungen unterstützten wir das Unternehmen um sowohl das Wachstum, als auch die notwendigen Flexibilitäten, die man braucht in so einem Großkonzern voran zu bringen, abzubilden	Selection of applications	76: wie lösen wir, im Wesentlichen 1:1, die Alt-Anwendungen so ab, dass wir auf den nächsten Level, der technologischen Sicherheit kommen. Sprich: höheres Transaktionsvolumen, aber gleichzeitig auch höhere Flexibilität in der Umsetzung neuer und neuester Geschäftsanforderungen. 56: Wachstum im Bezug erstmal ganz brutal im Bezug auf Volumen.	Which application platform can replace the extant one in order to support business requirements?	36: um sowohl das Wachstum, als auch die notwendigen Flexibilitäten, die man braucht in so einem Großkonzern voran zu bringen, abzubilden 79: neue Geschäftsfelder, neue Geschäftsmodelle, für die wir eine neue IT brauchten. Konkret jetzt in dem Kontext, wir wollen mehr stärker in das Dialyse Service Geschäft rein. Also weg von dem reinen Produktselling. Wir wollen stärker rein in den Bereich […] Krankenhausdienstleistungen. Und darüber wurde natürlich ein ganz neues Produkt und ein ganz neues Anforderungsprofil an so eine EDV Landschaft notwendig. 90: die Anwendung ist im We-	Support business strategy (growth in terms of volume and in terms of product markets) Allow for flexibility for yet unknown business requirements Interface to users and business strategy for IT department

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reasoning quote	Reasoning summary
					sentlichen die Schnittstelle gewesen zur Unternehmensstrategie und zu den Anwendern.	
12	None (no transcription)	Decision on process support by IT	None	Which processes can be automated through IT?	None	Supports the given business strategy (cost leadership, increase of cost/income ratio)
13	162: Aus diesen Grundsätzen gibt's dann eine IT-Gesamtstrategie […] 165: nach dem Motto: Wir wollen in den Standorten Schweden, Ungarn etc. ERP-Systeme mit diesen und jenen Funktionalitäten liefern. […] Buchhaltung für den Komplettkonzern durch entsprechende automatisierte Rechnungswesensysteme unterstützen. [...]	Which application to use for a certain process area/in certain regions	None	None	162: IT-Gesamtstrategie, die eingebunden ist in die Strategie des Finanzvorstands. 165: Erst mal für die Gesamt-IT 168: Also das sind Aussagen, strategische Aussagen, die wirklich einen Blick von zwei ... ich sage mal, von einem oder eher in der Größenordnung von zwei bis drei Jahren hat.	Supporting business strategy (expansion) Corporate-wide impact (across all BUs) Long-term plan (2-3 yrs)

Table 20: Application landscaping - interpretation of decisions and reasoning

b. **APPLICATION SYSTEMS STANDARDS** include decisions on the standardization of application systems in functional or process domains, such as accounting or billing. Here it is not a question of "which functionality is needed" but rather to what extent business processes can use the same applications and whether they can use standard software or will require custom-built software ("For which process domains can we use standard software and where should we use custom-built software?" (case 5); "[…] we conduct mail business […] in different countries, in very different facets – you have to make the decision once on whether we want to standardize, do we believe we can standardize that, yes or no" (case 7)).

- Decision on the use of standard vs. custom-built software for processes/process areas (case 5)
- Decision on standardizing applications and the underlying processes (cases 5, 7)
- Decision on making all applications audit-ready (case 9)

Again, the interviewees gave a number of different reasons for these decisions being strategic (see Table 21).

The decision to use standard software vs. custom-built software involves a trade-off: on the one hand, using standard software – just as standardizing process areas, i.e. using the same software for different instances of the process (e.g. in different geographical regions) – increases **corporate-wide synergies** or in other words decreases cost. Business units have to be regulated (i.e. driven to use standard software), because the natural tendency of each unit is to regard itself as "too unique" for standard software and hence requiring custom-built software reflecting its uniqueness. If every business unit were to be indulged accordingly, the result would be different applications for similar processes, resulting in unnecessary costs. Application standards hence **counter the business units' expensive tendency towards being different (e.g. their desire for custom-built applications) that causes complexity**. Standards do so by keeping the applications reusable and reusing applications (or parts of them) across processes (cases 5, 7).

On the other hand, using standard software for business processes that really need to be specialized is counter-productive: business units deprived of specialized software were argued to risk losing customers. Using standard software in a process area for which differentiation on the market is important (e.g. by offering special tariffs to customer groups, i.e. following a differentiation strategy), might lead to a loss of market share in these cus-

tomer groups if the standard software does not support these specific features. To this end, the decision has to be made **to not hamper business strategy**: the processes that really need differentiation have to be allowed to use custom-built software or software that does not conform to the company's standard, whereas those processes that do not need differentiation should use standardized software (cases 5, 7).

Furthermore, conforming to certain standards was seen as a strategic decision because it **was necessary for strategic business initiatives**. In case 9, the business strategy foresaw to become listed on the stock-exchange, which required the applications to comply with certain auditing rules. If these requirements had not been fulfilled, the strategy could not have been executed.

Application standards were also viewed as strategic because **other decisions depend on whether the applications become standardized**: for example, if the applications become standardized, the underlying infrastructure will be affected as well. Other applications will be affected because the applications that become standardized are connected to those applications. And finally, responsibility-related decisions will be affected, such as where the applications should be developed and maintained: if they are standardized, the application management is likely to become centralized, too (case 7).

Case	Decision quote	Decision summary	Context/detail quote	Context/detail summary	Reason quote	Reason summary
5	42: Wo kann ich keine Standard-SW einsetzen, wo gibt es keinen Dienstleister, der für mich genau diese IT, ja ich sag mal Module oder Domänen anbieten kann. Wo muss ich es wirklich selber machen. 60: Also kann ich's am Markt einkaufen, gibt es Standardsoftware dafür, gibt es Dienstleister die das für mich machen oder muss ich es eben doch selber machen, weil ich Spezifika habe. 80: Das ist ein Teil der Logik natürlich, kann ich Standardsoftware einsetzen	Decision on use of standard vs. custom-built software	Reason quote: 30: Warum denke ich in dem Sinne da drüber nach? Weil im Rahmen der [company] viel gesagt wird IT ist so wichtig, das man es selber gestalten muss und ich glaube, dass über die Zeit hinweg sich IT in vielen Gebieten zum Commodity entwickelt hat, was ich im Prinzip überall einkaufen kann und damit weniger strategisch wichtig wird. 41: Also wo ist das ein Wettbewerbsvorteil. Wo kommt es auf hohe Prozesseffizienz und Prozessqualität über bestimmte Wertschöpfungsketten hinweg an. Wo kann ich keine Standard-SW einsetzen, wo gibt es keinen Dienstleister, der für mich genau diese IT[…] anbieten kann. Wo muss ich es wirklich selber machen 62: Z.B. auch noch mal Billingsoftware oder insges. Kundenbetreuungssysteme bei uns im Konzern. Wenn ich auf Standardsoftware dort umschalten würde, kann ich nicht mehr jede Produkteigenschaft/Produktkonfiguration abbilden, die wir heute unseren Kunden anbieten. Und durch solche Produktkonfigurationen, also nehmen wir mal bei der [sub-company X], diese [product name]-Tarife. Das ist nicht Standard. Wenn ich dort dann auf Standardsoftware umschalten würde, könnte ich solche Tarife nicht mehr anbieten und würde damit natürlich am Markt entsprechen was verlieren an Potential.			One the one hand, countering business units: every unit claims to have the need for specialized applications, leading to costly IT. On the other hand, using standard SW in a field with a need for differentiation from competitors makes differentiation impossible.
7	136: Beim Applikationsbereich, da würde ich sagen, da ist so eine erste Frage, die man sich stellt, macht es Sinn zu standardisieren	Standardizing applications	139: wir machen […] Delivery von Briefen[…] in verschiedenen Ländern, in unterschiedlichsten Facetten, da muss man einmal die Entscheidung fällen, wollen wir standardisieren, glauben wir das standardisieren zu können […] wenn aber die Entscheidung gefallen ist, die Prozesse sind so ähnlich, dass es Sinn macht, einheitliche Systeme einzusetzen, dann wird's auf einmal zu einer strategischen Entscheidung. 192: und da haben wir jetzt schon die	Decisions become strategic only if they have an impact across regions Decision on application standardization influences the other (subsequent) deci-	147: wenn die aufzeigen, dass es viele Synergien gibt, in einem größeren Verbund, 205: weil es übergreifende Bedeutung hat 209: Für mich sind einfach alle die Themen strategisch, die ne Visibilität über die Landesgrenzen hinaus haben. 224: da muss jemand mit ner übergeordneten Sicht dran, weil das eben genau strategischer ist, da sind verschiedene Einheiten, die zusammenarbeiten müssen und wenn ich jetzt einmal	Gaining synergies across regions Corporate-wide impact Can be reused (is a blueprint)

Case	Decision quote	Decision summary	Context/detail quote	Context/detail summary	Reason quote	Reason summary
			Entscheidung gefällt, Applikationen relativ standardisieren, demzufolge die Infrastruktur, also eigentlich baut sich alles über die Applikationen auf. 354: Ausgangspunkt ist eigentlich wie ähnlich sind die Geschäfte, die wir in den einzelnen Landesgesellschaften haben.	sions on standardizing infrastructure Applications become standardized if the underlying business processes are similar	was für einen baue, dann möchte ich das gleich so aufbauen, dass ich das später mal für einen anderen Kunden in einem anderen Land auch noch mal nutzen kann und nicht ne super Speziallösung für Dich. 229: also strategisch ist wirklich das, aus dieser Sicht, was über Landesgrenzen hinweg relevant sein kann und die Betonung liegt dann wahrscheinlich auf „sein kann", und nicht zwangsläufig auf „ist". 195: Wenn ich sehe, dass die Prozesse ähnlich sind in den Landesgesellschaften, dann macht's Sinn zu standardisieren und dann folgen die anderen Sachen auch, d.h., bestimmte Entscheidungen, die ich irgendwo fälle, bekommen sehr schnell strategische Bedeutung, da sie quasi ein Blueprint sind für irgendwelche anderen Gesellschaften	
9	910: Aber wenn Sie so ein Thema haben, zum Beispiel Auditfähigkeit der IT-Systeme, weil Herr [CEO] den Konzern […] börsenfähig machen möchte […], dann haben wir in der IT was zu tun, um die Auditfähigkeit, Basel 2, SOX und so ein Kram in Ordnung zu bringen	Making IT systems conform to certain auditing standards	-	-	910ff: börsenfähig […] dann haben wir in der IT was zu tun, um die Auditfähigkeit, Basel 2, SOX und so ein Kram in Ordnung zu bringen	Is needed to reach an important business goal of the company (e.g. going public)

Table 21: Application standards - interpretation of decisions and reasoning

c. **TECHNICAL ARCHITECTURE STANDARDS** are concerned with the high-level technical structure underlying the application systems, i.e. the technical infrastructure. Architectural standards are the rules, policies, or guidelines that any application or technical solution has to follow: "[…] no one could bypass that. Like in Germany, 'everybody drives in the right lane'" (case 3). Examples include the choice of databases or operating systems to use or the type of architecture (e.g. host-based vs. browser-based, service-oriented architectures vs. monolithic architectures). In detail, the decisions subsumed under this decision area were:

- Decision on design principles (e.g. 2+1/2 node concept, Service-Oriented Architecture (SOA) vs. monolithic, method of connecting locations with networks, host-based vs. browser-based architecture, open source vs. proprietary software) (cases 4a, 5a, 7, 10a, 12)
- Decision on IT standards
    - Should we set internal standards at all? (case 2)
    - How many different technology standards are needed? (cases 5, 9)
    - Which technologies should we use as an internal standard? This decision involved the selection of which platform technologies and standard software packages to use (e.g. use of SAP as the standard for ERP solutions; use of Oracle as the standard for DBMS; use of Unix as the standard operating system; use of SUN computers as the standard for server hardware, etc.) (cases 1, 3, 4b, 6, 8, 10b, 11a, 13)
    - Determining the timing of technology changes for applications (e.g. when to migrate to the next release, when to introduce "Netweaver" technology, etc.) (case 11b)

The reasons given for arguing that these decisions are strategic were diverse. On the one hand, some participants (cases 5, 8, 10, 12) again stated that the decisions **have to reflect the given business strategy**. For example, different technologies will be chosen if the business strategy aims at a short time-to-market than if the business strategy aims at cost-leadership (case 8). As another example, if the business required "flexibility," this was translated into the need for a flexible technical architecture, hence moving to a "model-based architecture" that promised more flexibility (case 12). In case 10, technology standards were seen as a way to **ensure that the strategic business direction was not vio-**

lated on a technical level. For example, business units would have to be regulated to not use "Flash" technology: websites relying on that technology would exclude disabled people from accessing the site, hence violating the strategic decision to extend the scope of the online bank to include disabled customers.

On the other hand – and almost contrary to supporting a given business strategy – setting technology standards was seen as a **counterbalance** to business units and vendors (cases 3, 4b, 6a, 8). This reasoning was explicitly stated by some interviewees to be "IT strategic" rather than "business strategic" (cases 3, 6a, 11a, 11b). With this, they also implied that it was not meant to support business strategy. It was argued that business units are short-sighted and only interested in meeting their immediate business requirements (in the form of applications) with whatever technology it takes. Leaving this behavior without a counter balance, i.e. without regulation enforcing a longer-term, **sustainable** view, the IT infrastructure would soon become "a technology zoo" (case 8). Such a collection of heterogeneous technologies was said to not only be **costly** to operate but at some point in time **too complex** ("entropy", case 8), eventually resulting in an overall **inability to fulfill future business requirements**. Even if they could be fulfilled in theory, it would not be feasible economically because large parts of the infrastructure would have to be changed (case 6). Hence, setting architectural standards aims at avoiding this complexity by enforcing orderliness, akin to the way the "police" (case 8) or traffic control enforces that "everybody drives in the right lane" (case 3). Hence, setting standards is a **prerequisite for keeping up the overall ability to deliver IT solutions to business units** and hence preserving the company's capacity to act by using IT **without compromising cost competitiveness** (case 5). Similarly, in one case (5), setting IT standards was seen as important for **facilitating organizational change**. In this case, having fewer technologies was associated with the easier consolidation of systems that was frequently required due to constant reorganizations within the company.

Reducing IT costs by finding synergies across the company was stated as a reason in itself for the strategic relevance of setting standards. These synergies were seen to materialize through increased negotiation power in purchasing and through economies of scale. Using the same technology corporate-wide meant a higher purchasing volume for this technology and hence greater negotiating power if purchased from the same vendor, ultimately leading to lower prices (case 8). Using fewer technologies was also seen to lead to fewer overhead costs. Regarding economies of scale, it was argued that each new technology meant that specialists had to be hired to maintain these technologies. Hence, fewer

technologies mean fewer overhead costs. Thus, moving from multiple technologies to fewer technologies might result in lower costs through synergies in technology maintenance (cases 5, 7, 9, 13). Almost all interviewees viewed cost-efficiency through synergies as a strategic goal in itself, like an engineering goal that is worth fulfilling in itself, again independent of the chosen business strategy (i.e. independent of whether a cost-leadership strategy was followed).

Finally, the decision to choose a certain standard was seen as **long-term binding**, **very difficult to reverse economically,** and as **having a huge financial impact** (cases 1, 3, 4, 6, 10, 13). This perceived irreversibility was partly explained by the decision's **company-wide guiding impact on other decisions**. For example, if a certain technology is chosen, this means that the people who will be dealing with the technology (programmers, administrators, etc.) have to be trained to work with it. Systems using different technologies have to be migrated or partially rewritten to be compatible with the new technology. The decision could restrict the company's flexibility in the future (case 10). Hence, if the decision was changed frequently, this would mean an enormous investment in terms of time and money. Another reason for the irreversibility of technology decisions was more technical (case 1): because technologies are interdependent, the choice of a certain technology predetermines other technologies as well. This might lock the company into certain technologies as a side effect. Because the decisions are not easily reversible, they have to be planned very carefully in advance and the consequences and potential side-effects of these decisions have to be thought through (especially case 1). Switching to a new technology is hence seen as a **fundamental change** (case 6). Besides the potentially negative impact, the decision (which serves as a guideline) also has a positive effect: once the decision is made, it is not revisited and challenged all the time, but **brings certainty for subsequent decisions,** on which management can then rely (especially case 13).

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
1	287: dass Sie herauskristallisieren müssen, welche Technologien harmonieren miteinander, Technologiekonzepte, welche sind absolut diametral zu einander.	Which technologies to use in the future	280: Ich hab das vor kurzem noch verglichen mit Brückenpfeilern. Sie bauen Pfeiler und diese Pfeiler pflanzen Sie in die Landschaft und wenn dann jemand eine Brücke bauen muss, dann ist der Weg dieser Brücke vorgezeichnet, weil die Pfeiler sind ja schon da, auf die man diese Brücke aufsetzen kann. […] das Sie herauskristallisieren müssen, welche Technologien harmonieren miteinander, Technologiekonzepte, welche sind absolut diametral zu einander.	The decision on technologies to use in the future has to anticipate potential conflicts of technologies	200: Das Problem ist ja, dass Sie sich […] bei Technologieentscheidung in eine […] nicht klare Abhängigkeiten begeben […]So dann sind Sie beim Internetexplorer und dann können Sie relativ schnell so eine Dominokette aufbauen, mit der Sie wieder ganz zum Schluss bei .NET landen. .NET ist also natürlich […] konträrer Ansatz zu der ganzen Java Entwicklungsphilosophie […]D.h. Sie müssen letztendlich eine Landkarte der Zusammenhänge haben, wie sich was wo eingruppiert.	Not easily reversible; hence, dependencies between technologies have to be made explicit and anticipated
3	97: Also die Fragestellung, die ganz klar hier auf dem Tisch lag war: wir haben jetzt eine Anwendungslandschaft, jetzt brauchen wir noch ne Datenbank, jetzt brauchen wir noch ne Hardwareplattform, jetzt brauchen wir ein Betriebsmodell.	Decision on which technologies to use (technology standards) beneath the new applications	578: Fragestellungen, die sich aber immer orientiert haben an diesen Leitplanken, die man noch so nennen kann, die da lauten „Technologieentscheidung trifft die IT" „SAP ist gesetzt" und „Governance bedeutet: wir sind interner Dienstleister für den Gesamtkonzern".	Choice of an application platform (SAP)	90: die Anwendung ist im Wesentlichen die Schnittstelle gewesen zur Unternehmensstrategie und zu den Anwendern. Die Frage der Technologie war eine reine IT Interna und durch ganz andere Parameter getrieben. 96: Die waren schon strategisch in Ihrer… aber rein IT strategisch getrieben, also IT intern getrieben. 578: Fragestellungen, die sich aber immer orientiert haben an diesen Leitplanken, die man noch so nennen kann, die da lauten […] „SAP ist gesetzt" UP: da kam dann auch keiner dran vorbei. Wie in Deutschland ' wir fahren halt rechts	NOT because it is business strategic, different notion of strategic Is a guiding plank that regulates business units and guides subsequent decisions to ensure orderliness (like traffic control)
4a	307: Product Architecture ist die Übersetzung der Produktprioritäten und Produktwünsche in eine Architektur, wir haben eine Architektur definiert. 320: die Grobarchitekturen sind Ele-	Define high-level architectures, i.e. the structure of the products in the IS	330: Ein sehr typisches Beispiel [...] der Technikarchitektur. [...] wir bauen unsere Systeme normalerweise nach dem „2 and a half node concept". [...] müssen hier hoch sicher sein, wir müssen hoch verfügbar sein. Wir müssen im Falle eines Desasters weiter arbeiten. Also werden die Applikationen normalerweise als Clusterlösungen gebaut, die an 2 unterschiedlichen Standorten laufen können […] 342: Das ist ne ganz essentielle technische Architekturaussage, die wirklich ganz ganz starken	IT architectural decisions are design principles	342: Das ist ne ganz essentielle technische Architekturaussage, die wirklich ganz ganz starken Einfluss hat in alle Realisierungskomponenten. Rechenzentrumsstrukturen, Infrastruktur, alles. 366: Weil man sich langfristig festlegt. Ist immer ne Frage des Festlegungszeitraums. Genau wie ein „2 and a half node concept": ist eine langfristige Festlegung. 392: Weil Architektur letztlich so wichtig ist im Sinne von Festlegung […]. Wenn ich mal einfach	Influence on "lesser" decisions. Guides subsequent decisions. Long-term binding, irreversible.

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	mente unserer Strategie	department	Einfluss hat in alle Realisierungskomponenten. Rechenzentrumsstrukturen, Infrastruktur, alles.		über die Finanzen rede, die dahinter stecken, da legt man sich wirklich in Millionen und zig Millionen Beträgen fest.	Huge financial impact.
4b	Same as above	Same as above	357: A: Das ist noch auf der Strategieebene, wenn man es jetzt wirklich auf die Ebene bringt, also welches Kernbetriebssystem ist es, welches Kerndatenbanksystem ist es?	IT architectural decisions include determining technology standards	358: Also die Dinge, wo wir explizit oder implizit, eher explizit Entscheidungen treffen müssen, die uns auf die nächsten 5 Jahre Minimum binden. 309: Architekturen sind absolut strategisch, die entscheiden darüber, ob man lieferfähig ist oder nicht lieferfähig ist [als IT Abteilung] 311: Sustainability […] stellt aber sicher, dass sich Effektivität oder Effizienz nicht in kurzfristigen Dingen erschöpfen, sondern langfristig wirksam sein können. Architektur stellt dies Sustainability sicher, die oft auch von den Business Areas nicht in gewünschtem Maße eingespielt wird. […] Klar, die wollen es in den ersten 2 Jahren alles haben, was ich verstehe. Aber da müssen wir halt auch mal eine Gegenperspektive anbringen, deshalb definieren wir hier Architektur	Long-term binding, irreversible Provides a counterbalance to short-sighted business areas to ensure sustainable delivery of IT services
5a	80: wie sind IT Architektur Leitplanken dazu	Decision on architecture principles	81: Also z.B. wenn ich in strukturell variablen Geschäftsfeldern drin bin, dann würde ich eher auf eine SOA basierte Architektur gehen und das als strategische Leitplanke festlegen. Wenn ich über strukturell stabile Geschäftsprozesse nachdenke Payroll, Finanz, also Accounting und solche Themen, dann denke ich eher dass das eine von der IT Architekturleitplanke, dann ist es nicht SOA, sondern dann gehe ich's schlicht auf eine Systemkonsolidierung ein. 238: wo spielt SOA ein Rolle […] das sehe ich so als wesentliche Architektur Leitplanken.	Architecture principles are e.g. the type of technology architecture used in a given business process	87: wo ist IT so kritisch pro Geschäftsfeld, dass es keinen Sinn macht divisionsübergreifend IT-Systeme zu betreiben und zu konsolidieren, und wo ist schlicht das Thema Synergienutzung der wesentliche Hebel 94: es nutzen nicht 3 verschiedene Divisionen 3 verschiedene Produkte, sondern nutzen ein Produkt im Optimalfall natürlich zusammengelegt auf eine Installation. […] Das ist in einem Großkonzern natürlich immer das kritische. Jede Reorganisation im Bereich der Personalsysteme erfordert umfangreiche Anpassungen: Personal muss von System A in System B transferiert werden, wenn man verschiedene Systeme hat. Und wenn die jetzt unterschiedlich ausgestaltet sind, dann macht das Ganze	Gaining synergies (cost reduction) vs. differentiation Architecture should be designed to not hamper frequent organizational change

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
					natürlich noch mehr Mühe.	
5b	105: So was wie eben Technologie-Standards zu setzen […] was weiß ich der ganze Konzern nutzt jetzt DB2	Decision on using technology standards	143: Aus der Konzernzentrale heraus, ist für mich eher die Frage, gibt es einen Standard oder gibt es 2 Standards für eine bestimmte IT Domäne? Anstatt selber festlegen zu wollen, wir nehmen DB2 statt Oracle. […] das sind die gleichen Geschäftsprozesse, warum lauft ihr heute mit 7 Systemen durch die Gegend […] bitte reduziert das Ganze innerhalb der nächsten 2 Jahre auf 2 Systeme oder auf 1.	Not which technology standards to use, but how many different ones	117: Schlicht Synergienutzung. Die Nutzung Effizienzsteigerung. Wenn man unterschiedliche Datenbanksysteme unten drunter liegen hat wird es ja noch komplizierter die Daten zusammenzuführen, man verliert im Einkauf z.T. Vorteile, man kann das Know-how nicht entsprechend nutzen im Bereich der Konfiguration und des Betriebes, also insofern macht es schon Sinn, auf Standards zu gehen. 309: Geschäfte funktionieren auch, wenn Sie 7 redundante Systeme haben. Aber man verliert auf der Kostenposition im Wettbewerb dann natürlich einiges an Vorteil	Synergy and efficiency Cost competitiveness
6a	46: Core-Applikationen, die versuchen wir auf unserer Enterpriseplattform zu betreiben, dass ist Unix-, sozusagen Solaris-Datenbanken	Introducing a standard platform with technology standards	Reason quote: 50: Auch das ist mal ein Grundsatz, welcher natürlich auch mit der Bank und den Anforderungen umgestoßen werden kann. Also wenn jetzt z.B. im Portfoliomanagement ein neues Tool evaluiert wird, wo wir sicherlich Teil des Evaluationsverfahrens sind, aber schlussendlich ja eigentlich nur eine untergeordnete Rolle spielen, dann kann das schon sein, dass das ein microsoftlastiges Produkt werden kann. Zwar ein Coreprodukt nicht mehr auf diese Enterpriseplattform betreibbar und dann müssen wir ein bisschen schauen wie wir, wo wir das einerseits betreiben […] 117: weil wenn wir nur business-driven wären, dann würden wir über kurz oder lang nicht mehr kosteneffektiv sein, weil das Business natürlich sehr schnell, sehr flexible Lösungen haben will. Longterm-mäßig funktioniert das einfach nicht über alle Grenzen hinaus, da muss man mit ner Menge fristigen Konzepten eben arbeiten, da muss man schon eben diese Grundsätze z.B. auch eben die Enterpriseplattformstrategie oder Environment, das muss man einfach unterstützen, um nicht mit jeder neuen Anforderungen auch hinten durch neue Infrastrukturen aufbauen zu müssen und die dann auch noch mit diesen Systemgrenzen hinaus zu integrieren. Das wird dann wirklich teuer. Wenn wir uns wirklich auf diese Grundsätze berufen können und darauf abstützen können, dann denk ich, sind wir relativ vielmehr in der Lage mit unwesentlich steigenden Maintanance- oder Produktionskosten die Bank in ihrem Wachstum einerseits, aber auch in der Ausrichtung vom Geschäft her, neue Geschäftsfelder, einigermaßen schnell zu supporten. 214: Also ich denk was durchaus strategisch ist, ist natürlich, dass wir sehr kostenbewusst sind, eigentlich kostengetrieben natürlich. Obwohl die Bank relativ stark wächst oder dürfen natürlich die Kosten nicht linear mitwachsen, das ist, das versteht sich von selber.			Business rules and IT has to deliver; however, standards are needed to be able to - react quickly to business requests - stay cost-competitive I.e. IT should not become a problem (cost-wise or because it makes certain requests difficult to implement) for business

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
			326: Aber diese Entscheidung ist sicherlich in seinem Grundsatz, befähigt uns eben, skalierbar auf das reine Wachstum der Bank, […] entspannt abzufädeln, ohne eben grundsätzliche neue strategische Ausrichtung der IT entscheiden zu müssen. 455: wie eben diese Ausrichtung auf diese ORACLE-Datenbanken damit verbunden, also man richtet sich ja nicht nur auf ORACLE ein, sondern man braucht die Leute dazu, man braucht die Mechanismen dazu und das Know-how. Man muss ja da auch, ich meine nur die ORACLE Datenbank zu betreiben, das ist das Eine, aber dass diese ganzen Mechanismen von einem Business-Contingency-Management darin dann auch zu verpacken, dass ist das Andere und ich denke so eine Entscheidung ist schon sehr strategisch und die kann man von heute auf morgen, also kann man schon, aber sollte man eigentlich nicht von heute auf morgen ändern.			This requires a counterbalance to "business drivency" Characteristics: - influences subsequent decisions - economically not reversible
6b	439: […] wir müssen da etwas grundsätzlich ändern, entweder bauen wir ein SAN oder ein NAS, wir haben uns für das SAN entschieden und das ist sicher etwas strategisches	Choice of technology	None	None	439: Also was meine einzelnen Investitionen natürlich schon, aber das definiert eher wieder, also wenn ich jetzt sage: okay, die letzte infrastrukturelle Ausrichtungsänderung, sagen wir mal wir sind wegen des Wachstums langsam an die Kapazitätengrenze gekommen, wir hatten bis dahin kosteneffektive Direct-Attached-Storage und haben uns irgendwann überlegen müssen, was machen wir jetzt, wir müssen da etwas grundsätzlich ändern, entweder bauen wir ein SAN oder ein NAS, wir haben uns für das SAN entschieden und das ist sicher etwas strategisches	Fundamental change for IT
7	126 Wenn es darum geht, Standorte, die wir in den USA haben, miteinander zu vernetzen und mit der Zentrale zu vernetzen, dann sehe ich das als eine strategische Entscheidung wie wir das tun wollen	How to connect decentral locations	123: Also wenn ich jetzt keinen Dienstleister hab mit dem ich Daten austauschen will, der in den USA sitzt, sondern wenn eine Tochtergesellschaft in den USA sitzt, wie der angebunden wird, ist mir nicht so wichtig. Das muss ja irgendwie funktionieren, das kann vor Ort entschieden werden. Wenn's drum geht, Standorte die wir in den USA haben miteinander zu vernetzen und mit der Zentrale zu vernetzen, dann sehe ich das als eine strategische Entscheidung wie wir das tun wollen.	Decisions that have only local impact are not strategically relevant	129: das hat auf die Verfügbarkeit der Applikationen, auf den Zugriff, auf die Daten, auf die Kommunikation relativ entscheidenden Wert [Einfluss] 209 : Für mich sind einfach alle die Themen strategisch, die ne Visibilität über die Landesgrenzen hinaus haben.	Influence on "lesser" decisions. Guides subsequent decisions. Corporate-wide impact (across regions)
8	89: ich frage mich,	Choos-	Reason quote:			Long-term

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	nehme ich PC-basierte Systeme oder Intelsysteme strategisch jetzt für beispielsweise ein Rechenzentrum oder bin ich verstärkt auf Host-System? Oder ich sehe es auf einer höheren Ebene, auf der Betriebssystemebene, dass ich sage, geht ein Konzern jetzt strategisch, sagen wir mal, Richtung Microsoft oder will man auf Linux gehen oder fährt man eine Hybridstrategie, Java, .NET, das sind so die großen aktuellen Weichenstellungen. Standard ERP-Systeme versus Eigenentwicklungen.	ing technology standards	94: so die großen aktuellen Weichenstellungen 117: Ergebnis der strategischen Überlegung, die auch wieder ganz oben beginnt, wenn ich ... wenn ich flexible schnelle IT haben will mit optimierter Time to Market, dann habe ich beispielsweise eben auch Systeme, die sehr, sehr einfach und schnell im Sinne von Rapid Prototyping, ja, Microsoftentwicklungssystem, so Visual Basic, ja, wo fast schon die Leute, die operativen Leute schnell mal im Corporate-Market Umfeld zum Beispiel, die haben eine Idee ein Derivat oder für irgendein Produkt und das coden die ein. Da ist dann Time to Market kritisch bei solchen Sachen. Und dann habe ich hier ... das ist dann meine Business-Idee, meine businessstrategische Optimierung und die spielt dann runter, dass ich sage, ja, mein Standard ist irgendwo zum Beispiel Microsoft. Das sind alles jetzt Beispiele. [...] Und andererseits sage ich, ja, gut, Zahlungsverkehr, das ist was, das ist millionenfach pro Tag wird das durchgeführt, da kommt es mir auf Stückkosten an. Weniger jetzt auf Time to Market. 371: Strategisch, wenn man es so definiert, sind das die Leitplanken, innerhalb derer man möchte, dass sich die weitere Entwicklung also in einer Vielzahl von Fällen auch bewegt. Dass ich nicht den Einzelfall entscheiden muss, sondern sagen kann, es gibt gute Gründe, ich möchte mich beispielsweise auch auf eine IT-Plattform festlegen. Ein Beispiel, wenn ich Microsoft wählen würde und das im großen Stile ausrollen würde, könnte ich bei Lizenzen viel Geld sparen, weil ich dann einfach auch Discounts bekomme, ich kann dann ganz anders einkaufen. Wenn ich konzernweit auf ein System standardisiere, dann kann ich da natürlich Skaleneffekte beim Einkauf erzielen. […] Und im Betrieb, wenn ich eine homogene Landschaft habe in meinem Rechenzentrum, dann brauche ich nicht so viele Spezialisten, dann kann ich es in einem anderen Schichtbetrieb fahren, dann brauche ich weniger Leute, als wenn ich wirklich einen Zoo habe, nicht? Das ist auch so ein Begriff, der Zoo, das ist ... oder eine Vielzahl von Exoten und jeder braucht seinen Spezialisten und braucht sein Backup und das ist unendlich teuer, statt wenn ich einen möglichst homogenen Park habe. Und das sind eben Gründe für Standardisierung. Und, ja, gut, strategisch sind sie eben deshalb, weil sie längerfristig ausgerichtet sind. 421: kann ich kurzfristig vielleicht ein gutes Schnäppchen machen, aber langfristig bin ich dann wieder in meinem Betriebsproblem und Anwendungs-Entwicklungsproblem. 408:Dann kommt die IBM und schlägt dann also in blühenden Farben vor, mit dem System haben wir einen perfekten Business-Case und erreichen unsere Business-Needs. Und in der Sekunde muss ich sagen: Ja, vielleicht, es kann sein, aber unsere Strategie ist eben genau eine andere 446: Governance und Strategie sind schon irgendwo Dompteure für die an sich sehr autonomen Agenten und auch divergierenden Agenten. Weil jedes Business irgendwo, das ist auch im Menschen dann psychologisch verankert, ist besonders und speziell und die Anforderungen sind besonders und speziell. Und jeder will eigentlich die geniale Lösung haben und alle Anbieter am Markt und alle Consultants wollen solche Speziallösungen verkaufen. Und damit hat man so eine Entropie und dem muss natürlich die IT-Strategie und Governance entgegenwirken.			guidelines have to be made in-line with business strategy Synergies (regarding IT procurement, scale effects in IT development/operations personnel) Counterbalance for short-sighted business units and vendors needed to ensure long-term problem-free and cost-efficicent architecture

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
			827: polizeiliche Wirkung […] auch.			
9	394: weil wir ja kein so ertragreiches Unternehmen wie jetzt eine Bank sind, dann sind solche Architektur- oder architektonischen Aussagen von enormer strategischer Bedeutung. 1113: Also Standardisierung ... hat auch was mit Strategie zu tun	Decision on architecture standards	1138: Die Strategiefrage, die wir bei dem Thema gestellt haben: Wie viel Entwicklungsarchitekturen brauchen wir, wenn wir von 100.000 bis 50 Millionen gehen?	Decision on how many different technologies are needed	749: Dann stellt die rein wirtschaftliche Frage: Müssen wir das für jeden Bereich mit einer anderen Technologie machen oder können wir eine Technologie einfach glatt machen und die macht alles? Also es hat dieses übergreifende Ding 852: wo gibt es Gemeinsamkeiten […] wenn wir den ersten Schritt gemacht haben, gehen wir den zweiten Schritt, wo müssten wir denn Gemeinsamkeiten sehen. 1070: Und ein Teil der Strategieaufgabe ist eben auch, zu identifizieren, wo könnte es einen Benefit geben, wenn ich es eben nicht fünfmal mache, sondern nur einmal	Synergies across the whole company
10a	1126: […] wir gehen jetzt komplett auf Open Source und gehen nur noch auf Java-Technik	Decision to rely on open source technologies	None	Reason quote: 1126: Weil die Entscheidungen, die da rauskommen, auch zum Beispiel jetzt auch einen IT-Wechsel vorzunehmen, ich sage mal, dass wir sagen, wir gehen jetzt komplett auf Open Source und gehen nur noch auf Java-Technik, das bindet das Unternehmen für drei bis fünf Jahre, diese Technologie, ich kann die ja nicht, zack, wieder ändern. Das heißt, die Entscheidung, die wir dort treffen, um neue Systeme anzuschaffen oder in neue Richtungen zu gehen, das ist schon gravierend. Bleiben wir beim Produktverkauf, dass wir sagen, wir haben eine neue Software gefunden, wo wir glauben, einen höheren Produktverkauf zu machen, allein das anzuschubsen, also die Infrastruktur wieder aufzubauen dafür, die System anzuschaffen, das kann ich nicht unter drei bis fünf Jahren entwickeln.		Fundamental decisions Long-term binding, not easily reversible and might consequently hamper future changes in business strategy Regulates business units in order to ensure
10b	1154: eine strategische Ausrichtung auf Lotus Notes 1334: Das Strategiepapier selbst hat 20 Seiten. Aber: Da steht z.B. auch drin: Lotus Notes […]	Which technologies to use				

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
				829: […] wenn jemand eine neue Idee hat, dann kommt er zuerst zu mir und sagt: Oh, ich habe eine Idee, ich will das und das machen. Ich sage: Pass mal auf, was willst Du machen? […] Und dann musste ich sehen, ob die bei uns rein passt. Weil ja bestimmte formale Faktoren, ein Hardfact ist zum Beispiel, wir wollen nur noch alles barrierefrei machen. Wenn der also mit Javascript ankommt, mit Spezialzeug, das ist nicht barrierefrei. Tolle Sache, die Du haben willst, aber nein, sie wird nicht, weil wir haben strategisch festgelegt, die IT-Strategie ist Barrierefreiheit. Das passt nicht rein. Flash-Animation, also ein Blinder und die aufpoppenden Bilder[…]Keine Chance […]Das Marketing sitzt da und weint: Ich will Flash. […] Es geht nicht […]		that strategic direction (having barrier-free website access for disabled people) is not violated on a technical level (by using technologies that are not barrier-free)
11a	20: Es gibt darüber hinaus auf der Ebene auch eine paar grundsätzlichere Architekturentscheidungen, die natürlich dann auch im Rahmen der IT-Strategie quasi geplant werden […]	Decision on which IT standards to use	78: Also das heißt, sie haben eine Zielplattform für Middleware definiert und dann konsequent auch neue Anwendungen nur dort stattfinden lassen. Ich denke, so etwas geht wirklich nur, wenn man auch strategisch so eine Plattform festlegt, ja?	Decision to concentrate on certain technologies (defined as the standard)	80: Das ist also für mich sehr wohl schon eine IT-strategische Entscheidung, die dann in den nächsten Jahren eine ganz klare Vorgabe letztlich enthält für alle IT-Anwendungen, für alle IT-Projekte. 108: mit dem IT-Bereich beschäftigt hat, das war ganz klar eine Strategie des IT-Bereichs, sagen wir mal so	A long-term guideline and regulation for all projects company-wide
11b	138: Und dann gibt es noch die dritte Ebene einer IT-Strategie, dass nämlich, wenn ich irgendwo ein technologisches Produkt habe, zum Beispiel haben wir das SAP-Portal als Standardportal im Konzern, dann brauche ich da natürlich auch eine Strate-	Decision on development path of an IS			175: Also das ist eigentlich eine sehr tiefe technische Ebene […] Aus der Sicht des Produktes ist es eine ganz relevante Frage, also eine wichtige strategische Frage auch, weil da kuckt man sehr wohl, wenn man gerade sich SAP-Standardsoftware sich anguckt, schon sehr wohl drei Jahre in die Zukunft, ja? Aus der Konzernsicht ist es natürlich völlig irrelevant. Also es ist keine konzernstrategischrelevante Fragestellung.	Strategic because it is a plan for a long period in the future Strategic from the point of view of the IT artifact, not strategic for the corporation

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	gie im Sinne von: Wann führe ich zum Beispiel Netweaver ein, wie gehe ich technologisch vor und so weiter. Wo will ich drei Jahren stehen mit meinem Technologie-portal?					
12	None	Decision on technology principles	None	Examples: moving from host-based to browser-based technologies	None	How business requirements and targets (e.g. flexibility or a certain cost/income ratio) translate to this lever: a) more flexible/cheap technology (e.g. model-driven architecture) b) using technology to automate
13	257: der Infrastruktur-Strategie zum Beispiel definiert: Welche Rolle hat für uns Linux als Betriebssystem 258: Wie wollen wir den Client ausstatten? Welche Software-strategie haben wir im Office-Umfeld und	Decision on which technology standards to use	Reason quote: 296: auf der einen Seite Synergie und Masseneffekte 431: Auch Architektur-Entscheidungen kann man ja auch nicht so ohne weiteres ändern. […] Das kann ich jetzt ja auch nicht morgen und übermorgen ständig ändern. [...] Und insoweit sind das Maßgaben, die einfach eine Relevanz haben, eine Dauerhaftigkeit und auch im Sinne ihrer Bedeutung eine Architektur-Entscheidung treffen, die eine hohe Dauerhaftigkeit hat 277: Dann ist das im Sinne der Infrastruktur-Strategie aus Sicht der IT ein vorgegebener Standard, an dem ist auch nicht mehr zu rütteln. [...] die Standardsoftware, in der wir diese Applikationen dann letztendlich installieren, wieder ein Teil der Infrastruktur-Strategie ist. Es wird also mit dem UB nicht darüber geredet, ob wir Oracle oder SAP machen. 288: SAP ist gesetzt			Gaining corporate-wide synergies Is a guideline for subsequent decisions Not easily reversible

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	solche Dinge. 277: Dann ist das im Sinne der Infrastruktur-Strategie aus Sicht der IT ein vorgegebener Standard, [...] ob wir Oracle oder SAP machen. 291: unserem standardisierten Werkzeugkasten					

Table 22: Technical architecture standards - interpretation of decisions and reasoning

d. **PROCESS STANDARDS** provide guidelines for developing or operating applications and the technical infrastructure. These may be guidelines on how to manage the lifecycle of applications (e.g. evolutionary vs. big-bang changes), which standard to use for IT operations processes (e.g. IT Infrastructure Library, ITIL), project management (e.g. PRINCE2, Projects in Controlled Environments), or software engineering (e.g. V-model vs. Rational Unified Process, RUP).

In detail, the decisions in this decision area were:

- Decision on the mode of evolution of application landscape (e.g. should we change our application landscape in an evolutionary approach or should we make "big-bang" changes?) (case 2)
- Decision on which standards to use for software engineering (process modeling, project management, etc.) (cases 4a, 9a, 9b, 12)
- Decision on the adoption of standards of IT operations management (cases 4b, 6, 9a, 11)

These decisions were argued to be strategic for reasons very similar to those of IT architecture standards.

First, the decisions **have to be made in congruence with business strategy**. In case 12, flexibility was stated to be one of the company's overall objectives, i.e. the ability to react to changes quickly and easily. This was translated into the need to have a more flexible, incremental, and iterative software development process (in this case RUP). A similar line of reasoning can be found in case 11: the changes in the industry (introduction of low-cost competitors) increased the pressure for staying cost-competitive. The business strategy foresees staying as cost-competitive as possible, even though no low-cost strategy is being actively pursued. This was translated to IT processes, which have to be standardized in order to reduce IT costs, seen as a requirement dictated by the strategic environmental requirements (and hence reflected in the business strategy as a strategic objective).

Connected to cost competitiveness was the reason that standardizing IT processes would lead to **corporate-wide synergies** by having everybody follow the same process standard instead of having multiple processes (cases 9, 11) – independent of whether this was a strategic business requirement or not.

Again, it was argued that being only "business-driven" (case 6) leads to a situation where **IT services cannot be delivered at all,** or at least **not cost-efficiently**. To **counter the**

complexity introduced by business units, it was argued that certain process standards, principles, and abilities are needed: in contrast to architecture standards, these standards do not try to regulate business units (and hence avoid the complexity they cause) but try to deal with the unavoidable complexity. In one case (2), no technology standards were set for applications. Instead, the ability to deal with all kinds of technologies and "integrate everything with everything" was postulated as a guideline, allowing the company to handle the complexity without regulating its business units with respect to which technologies they use. In another case (6), process standards were argued to ensure that IT services are delivered in an orderly and cost-efficient way. This was again argued to be on a different strategic level, not "business-driven" but "IT-driven" information strategy, which reinforces the notion of a counterbalance.

Furthermore, setting process standards were again argued to exhibit strategic characteristics: a decision to adopt a certain IT process standard (e.g. ITIL or RUP) is a **fundamental change** in how the IT department works and also changes the interface to the business units (cases 6, 12). Setting process standards also **reduces the complexity** of having very different ways of doing something (case 9). The way to do this is to set standards that not only serve as a principle or guideline, but as a **forcing** device for instilling **an orderly way** of doing things in compliance with the standard on a corporate-wide basis (cases 4a, 9). For example, in case 4, the interviewee argued that no one would voluntarily undertake process modeling (which was argued to be important because it supports the IT unit's ability to deliver its services) if it was not a strategic rule. Finally, the decision to adopt a certain process standard was seen again (just as architectural standards) as **not being easily reversible** (case 4). Once a certain standard was decided for, people would have to be trained, business units would have to adjust to a certain interface vis-à-vis the IT processes, etc.

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
2	278: spätestens seit dieser Entscheidung eben nicht alles auf einmal sonder sukzessive auszutauschen, ja klar, eine strategische Ausrichtung hatten, wir werden immer neue und alte Anwendungen nebeneinander haben. Das ist Grundprinzip. Darauf sind wir eingestellt eben auf Grund dieser Möglichkeit alles mit allem zu verbinden und das macht's eben möglich nur die Systeme zu erneuern, die auch aus fachlichen Gründen möglich zu erneuern sind und ansonsten auch ruhig mal technisch veraltete Systeme zu behalten	Decision on IT architecture evolution principles: to run old and new systems in parallel; to have an evolutionary architecture rather than a planned one	245: weil wir durch diese kleinteiligere Betrachtung der Fachbereiche für sich, zwar gezwungen sind, alte und neue Systeme immer miteinander zu integrieren. […] Andererseits sind wir dadurch eben auch stark geworden in dem Sinne, dass wir sehr gut verschiedene Architekturen miteinander integrieren können. Wir haben eine Plattform, dass ist von IBM die MQSeries, das alle technischen Plattformen miteinander verbinden kann […] weil wir eben alles von Windows über OS/2 über Unix oder Z/OS oder was weiß ich nicht mit MQ verbinden. Wenn jetzt irgendeine Anwendung kommt, völlig egal ob sie gekauft ist oder selber gemacht und welche Architektur der Anbieter gerne hätte, wir integrieren es 423: haben wir eben ein evolutionäres Modell für unsere Anwendungslandschaft (=Anwendungsarchitektur). Und da gibt es überwiegend nur die Ausrichtung an Geschäftszielen an der Stelle. Evolutionär heisst eben, dass wir nicht beschließen: in den nächsten 10 Jahren wollen wir eine komplett neue Anwendungslandschaft aufbauen und dann dieses Ziel verfolgen, sondern projektweise entscheiden: das ist jetzt das richtige. 383: Das ist aber in einer Reihe von Projekten so entstanden, da gab es keine Planung davor, die besagt hat: wir gehen jetzt auf Thin Client.	Decision on IT architecture principles implies the (technological) capability to integrate all applications with each other in order to be able to fulfill BUs' requirements No planning of technology standards (area c)	239: sich die Entwicklung sehr stark an Geschäftszielen, Unternehmenszielen ausrichtet 276: Weil die Beherrschbarkeit hiervon natürlich besser ist, als so eine Art Big Bang, wir machen mal alles neu. 301: Die strategische Planung berücksichtigt nahezu ausschließlich Geschäftsanforderungen und den Aspekt Betriebs- und Wartungsfähigkeit. Sprich wenn die Technik einfach aus der Wartung geht, dann wird man was tun müssen. Aber das lässt sich auch noch lange hinauszögern.	Business requirements have highest priority Hence, no IT constraints (e.g. through standards) are accepted As a consequence, the architecture gets complex. Hence, the ability to integrate all technologies with each other is needed.
4a	345: […] wir wollen dafür Sorge tragen, dass wir unsere Aktivitäten insgesamt, die wir betreiben im Rahmen von Businessprozessen beschreiben. Mag trivial erscheinen, ist aber nicht trivial. Weil es nicht alle	Policies for process modeling			350: Das ist deshalb so wichtig, weil es ein Zwangskorsett anlegt, andernfalls geschieht es nämlich nicht. Da gehen wir sogar mal ganz bewusst, ganz tief in der Aussage.	Guidline: force people to act according to the policy.

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	tun. Und es wäre übrigens schon eine Strategieaussage, obwohl Sie sie sehr stark auf die Toolebene reduzieren können, wir haben dafür ein Tool und das heißt ARIS.					
4b	399: Delivery Organisation and Processes beschreibt dann: da gestalten wir sozusagen, wie bauen wir unsere Aufbau- und Prozessorganisation auf.	Decisions about the processes of the IS unit	401: Weniger gern genommen aus alten Zeiten heraus, ist die Prozessstruktur. Was weiß ich und wir bauen uns im Bereich Operations ITIL konform auf und etablieren die Prozesse	Selection of IT process standards	417: Genau, weil es einen mehrjährig bindet, wenn man diese Entscheidung neu getroffen hat, dann sollte man nicht ohne Not davon abgehen.	Long-term binding, irreversible
6	329:Was wir uns vielmehr in letzter Zeit auch mit der IT-Strategie dort beschäftigen, ist mit dem Prozessframework, also wir sind, wir haben uns dort schon auf die Fahne geschrieben, uns ein Prozessframework zuzumuten in Richtung ITIL 359: also wir führen das überhaupt ein, also das hat auch wieder mit Umbau zu tun, heute an der Abteilung	Introducing an IT process standard and reorganizing the IT unit	Reasoning quote: 333: bis dato praktisch keine Ressourcen frei machen können für das, weil wir eben diese business-driven-Strategie rausgegeben haben und jetzt meint das Business scheinbar, wir arbeiten nur noch für Business. Das ist eine kleine Gegenkorrektur, denke ich jetzt auch für das nächste Jahr 350: also auch strategisch ansehe, das hat aber gar nichts mit business-driven IT-Strategien zu tun, sondern das ist IT-driven […], um jetzt wieder zurück zu kommen, auf einen normalen administrativen Level und dann wieder kosteneffektiv oder ressourceneffektiv zu bleiben 360: Morgen wird das nicht mehr funktionieren oder morgen will ich auch nicht mehr so funktionieren 510:Weil sich dadurch ja auch die Zusammenarbeit und die Art und Weise wie wir in der IT funktionieren, verändert [...]			Counter-balance business units to keep up ability to fulfill IT services in a cost-effective way Changes the way IT operates dramatically
9a	922: Dass wir im Betrieb ITIL haben, das ist das Betriebskapitel hier [im Dokument IT Stra-	Decision to introduce ITIL			None	

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	tegie]					
9b	1016: Und meine Strategieaussage ist: Ich möchte bei den Vorgehensmodellen mitreden	Standardizing process models	1017: in den Vorgehensmodellen die Schnittstelle zu den Kunden niedergelegt ist und ich finde es nicht in Ordnung, wenn der Personenverkehr andere Schnittstellen zu unserem Dienstleister hat und andere Ergebnisdokumente verlangt als der Station und Service, weil die sind dann wieder nicht vergleichbar. 1043: ...das hat einen konzernweiten Impact			Corporate-wide impact
9c	883: Ich sage, dass wir sehr viel früher und intensiver als heute modellieren müssen, ob das ERM oder UML ist, das ist egal."	Decision to conduct process modelling			881: … um die Komplexität zu beherrschen	Reduce complexity
11	663: Was wir jetzt eigentlich machen in der Konzern-IT-Strategie, ist, wir gucken systematisch durch alle möglichen Arbeitsfelder, die es gibt im IT-Bereich, wo sehen denn irgendwelche Leute einen Handlungsbedarf. So. Und der wird in der Tat dann versucht, zu beschreiben. Und einer der Bereiche, wo man das sieht, ist in der Tat die Standardisierung von IT- und Support-Prozessen.	Standardizing IT processes corporate wide	247: Es geht also nicht darum, wie kann IT eingesetzt werden, um irgendwo Kosten zu sparen, das heißt, um Geschäftsprozesse kostengünstiger zu machen, sondern eben wirklich eine interne Sicht der IT 226: Jetzt ist eher der Tenor, zu gucken ... Es gibt einen hohen Kostendruck auf den [company]-Konzern und die Frage ist letztlich, wie kann die IT in ihrem eigenen Betrieb kostengünstiger produzieren. Und ein Hauptthema sind natürlich Skaleneffekte, die man realisieren kann, Wiederverwendbarkeit, Mehrfachnutzung. Und das ist jetzt der Schwerpunkt der IT-Strategie, dass wir gucken, in welchen Bereichen könnte man denn, wenn man es gemeinsamer macht, einfach die Kosten senken.	Standardizing IT processes results in cost reduction	235: Durch Synergien, genau. 283: Was sind denn die strategischen Herausforderungen des [company]Konzerns? Und die strategischen Herausforderungen sind die Tatsache ... Also was für die Airlinebranche relativ neu ist, das Geschäftsmodell verändert sich massiv im Moment. Und es gibt in Europa jetzt Low-Coster und keiner weiß, was sich mittelfristig daraus entwickelt. Deswegen ist sehr wohl die strategische Positionierung des <company>-Konzerns, wir müssen im Prinzip dicht an den Kostenführern sein und wir müssen in der Lage sein, sehr flexibel unsere Kosten zu verändern. Das sind so die beiden Hauptvorgaben. Das sind die strategischen Ansagen des Konzerns.	Synergies corporate-wide Cost competitiveness required as a result of industry changes
12	None	Decisions on IT processes and	None	E.g. the use of the Rational Unified	Summary: Business requirements and targets (e.g. flexibility or a certain cost/income ratio) translate IT processes into a more flexible IT development process and	

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
		organiza-tion		Process	cut IT operations costs Organization of IT department strongly influences how IT communicates and works, and thus how it can add to business success	

Table 23: IT process standards - interpretation of decisions and reasoning

e. **INVESTMENT PORTFOLIO DECISIONS** focus neither on the functional nor the technical side, but on the prioritization of the allocation of financial resources to concrete initiatives (although functional and technical criteria might serve as a basis for this decision). The decision involves a trade-off between different requests, e.g. for projects to build applications or technical infrastructure. The main decision object is the application/project portfolio: "The focus of the documents or the IT strategy work in the business units actually is the portfolio […] with mid- to long-term projects […] the decision on which applications so to speak get into the portfolio and will then be […] developed" (case 11). This decision was found in cases 4, 8, 11, and 13).

The reasons for viewing investment decisions as strategic were the following: first of all, once the application portfolio has been decided, it is clear which applications will have to be developed in the coming years. Hence, this decision serves as a **long-term work-plan** (case 4) that **prioritizes business requirements** and is at the same time used for allocating IP (human and financial) resources (cases 4, 8, 11, 13). This argument was used independently of whether the projects in the application portfolio were strategic or not. The main concerns here were that applications are in fact what the business units want and that there should be some kind of prioritization to serve as a **guideline for allocating scarce resources**.

Only cases 11 and 13 focused on the kinds of projects in the portfolio: it was stated that projects **enable business units to change** and to develop their business further (case 11). It was further argued that application portfolio prioritization is strategic because it **ensures that the resource allocations are in congruence with business strategy priorities and with the desired competitive position** of the business units (case 13).

In case 11, a "political" explanation was given: prioritization also means that certain applications will not be funded, but because each business unit wants its projects to receive funding, this dilemma **can only be resolved by top management,** whose intervention was seen as a characteristic of strategic decisions.

Two aspects concern the **time-span** of the decision and the **organization level**: almost all portfolios are yearly plans that are re-evaluated in each annual planning cycle (although some projects span longer terms). The decision on the application portfolio is made at the business unit level rather than on the corporate level (cases 8, 11). The corporate level would at most be concerned with inspecting large projects affecting multiple business units.

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
4	164ff: sagen, wir setzen […] 70% aus unseren Ressourcen, direkt Business Area-wirksam ein und wir setzen 30% unserer Ressourcen für die Infrastruktur ein.[...] Die [Business Area wirksamen] könnten Sie noch mal unterteilen und sagen: wir setzen 30% unseres Portfolios für das Thema „Geldmengensteuerung" ein	Allocating resources to themes	164: Und da steht schon und wir setzen einen besonderen Fokus hier drauf und wir setzen einen besonderen Fokus da drauf, aber es ist nicht eine Listung von einzelnen Projekten, dass wäre jetzt auf der nächsten Ebene. […] Das wäre nicht mehr strategisch! […] durchaus sagen, wir setzen 60% unserer Ressourcen oder 70% aus unseren Ressourcen, direkt Business Area-wirksam ein und wir setzen 30% unserer Ressourcen für die Infrastruktur ein.[...] Die [Business Area wirksamen] könnten Sie noch mal unterteilen und sagen: wir setzen 30% unseres Portfolios für das Thema „Geldmengensteuerung" ein.	Investments not specified on the level of projects, but rather on the level of resource allocations (priorities) to certain business units and themes	212: folgende Schwerpunkte in einem Mehrjahresplan. Eine Strategie schaut über 3-4 Jahre. Oder sagen wir mal 3-5 Jahre, so in der Größenordnung	Is a long-term plan Is a resource allocation to main topics (prioritization)
8	158: Natürlich, das sind Einzelprojekte. Investments ... und dann ist natürlich die Strategie eine strategische Entscheidung, welche großen Projekte gehe ich denn an.	Decision on which projects to invest in (project portfolio)	165: [wie] tue ich meinem Projektportfolio top down eine Struktur geben, zum Beispiel dass ich sage, also in diesem Jahr wollen wir einfach den Anteil von Vertrieb, Vertriebssystemen in unserem Projektportfolio einfach mal erhöhen, also letztlich mehr Geld für den Vertrieb, für die Vertriebs-IT. 178: das sind zweierlei Typen, wenn man so will, das eine sind die ... also wir sagen im Banking, da gibt's run the bank, change the bank. [...] Und daneben gibt's dann noch, [...][die regulatorischen Anforderungen, Basel II, davon haben wir nur sehr bedingt was, aber es muss halt getan werden.	Decision about project portfolio prioritization (including all types of projects, not only strategic projects!) Done by	-	Prioritization of topics Direction where to allocate company and IT resources

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
			[...] Und diese drei Kategorien werden aber alle im Blickpunkt der IT-Strategie 320: Also das Portfolio ist bei uns auch noch dezentraler, also es ist nicht so, dass Corporate das Portfolio festzurrt [… from 235] Aber wenn es eben drum geht, eine große ERP oder eine EAI-Plattform anzuschaffen, dann ist das was, was im Rahmen von [corporate] IT-Strategie auch mal durchleuchtet wird. 340: Entsprechend tun auch die Business-Units […] Portfolien zumindest stark vorschlagen und stark beeinflussen [...] Und die werden dann durch Corporate auch geprüft, aber eben der Einfluss ist da stärker bei den großen strategisch relevanten Projekten und geringer bei den Maintenance-orientierten Sachen	business units Corporate strategy only includes evaluating the unit-overarching projects		
11	17: Schwerpunkt der […] der IT-Strategie-Arbeit in den Geschäftseinheiten ist eigentlich das Portfolio-Management mit mittel- oder langfristigenen Projekten.	Decisions on the application portfolio	66: Entscheidung, welche Applikation sozusagen kommen in das Portfolio, werden im nächsten Jahr dann eben entwickelt oder, was weiß ich, weil eben große Wartungen 194: Die [Business unit 1] haben wir zum Beispiel wir haben die [BU2], wir haben [BU3] und in jeder dieser Gesellschaften wird ein eigenes ... gibt's eine eigene IT-Abteilung erst mal und wird ein eigenes IT-Portfolio entwickelt. 200: Gibt's auch ein konzernübergreifendes Portfolio oder ist das wirklich komplett dezentral? [...] Im Moment ist es noch komplett dezentral	Which applications to develop for each business unit separately Not on corporate level	180: „Was ist eine IT-Strategie?", das ist das Portfolio-Management unter anderem auch deswegen, weil das ist natürlich die engste Schnittstelle zwischen dem Business in den Geschäftsfeldern und den IT-Abteilungen. Und das ist sicherlich die höchste Erwartung an eine IT-Abteilung an eine interne IT-Abteilung, dass sie eben die Business-Weiterentwicklung in Form von IT-Projekten unterstützt und ermöglicht. Deswegen ist das die Hauptfragestellung eigentlich. 373: Also wann nenne ich etwas IT-Strategie? Und die erste Reaktion wäre: das, was Relevanz für den Vorstand hat. Das ist das, was ich IT-Strategie nennen würde. [...] Deswegen ist das Portfolio-Management mit Sicherheit einer der wesentlichen strategischen Bausteine, genau wegen dieser Interaktion mit anderen Business Units muss so ein Thema letztendlich in einem Vorstand, nämlich in dem Vorstand dieser SBU entschieden werden. Damit ist das per se ein Vorstands-Thema. 389: jedes Portfolio beinhaltet Themen, die man	Is closest to business requirements: how IT can support business development/change Is a resource allocation/ prioritization Has relevance for top management: every unit wants a share of the budget; thus, top management needs to resolve the issue

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
					nicht macht. So, und da will natürlich jeder Bereich, dass seine Themen zu denen gehören, die man macht. Das heißt, letztlich ist es etwas, was auf der Vorstandsebene in einer SBU erst entschieden werden kann oder aufgelöst werden kann. 397: Und jeder Bereich wird letztendlich durch einen Vorstand repräsentiert und dann müssen eben diese Vorstände halt gemeinsam als Organ für ihre SBU eben sagen: Okay, dahin schicken wir unser Geld.	
13	349: Projekt Roadmap […] pro Unternehmensbereich 345: Menge von Applikationen, die sozusagen eingeführt werden soll	Decision on application portfolio by BU	445: Das sind diese Projekt-Roadmaps, wo dann sehr stark darauf geachtet wird, wie priorisiere ich jetzt die Projekte. Wenn man eine Architektur-Entscheidung getroffen hat und dann heißt es „Wir machen CRM, wir machen Kassen-Lösungen am Point of Sale, wir machen Retail, wir machen das und das", damit habe ich mein Haus definiert. Jetzt stellt sich natürlich die Frage, wenigstens IT-technisch geht das so, mit was fange ich jetzt an? 454: Also ist das CRM-System […] wichtiger vielleicht als eine Supply-Chain-Management-Lösung. Oder ist es […] so, dass wir gerne ein BW hätten, aber […] wir sagen das ist notwendig, […] aber eher aus der strategischen Betrachtung nice to have, bringt uns im Sinne der Wettbewerbssituation mal eher wenig. 484ff: […] jährliche Projektpiorisierung im Rahmen eines IT-Planungsprozesses und in diesem Zusammenhang wird die jährliche Projekt-Roadmap unter dem Blickwinkel der Business-Strategie immer überprüft, wo man sagt: Jetzt haben wir uns für dieses Jahr eigentlich Business Warehouse vorgenommen, aber E-Shops sind wichtig, also werden die vorgezogen. In der Ressourcen-Planung wird dann festgelegt, wie viel IT-Ressourcen in dieses Thema eingekippt werden[...]	Project prioritization in terms of strategic relevance (not: innovation planning or identifying SIS) BUs make suggestions and IT helps in prioritizing	450: Jetzt stellt sich natürlich die Frage, wenigstens IT-technisch geht das so, mit was fange ich jetzt an? 462: So versuchen wir dann im Sinne der Projekt-Roadmaps die strategische Relevanz für den Unternehmensbereich zu adressieren, also zu sagen, das haben wir ... Man kann es vielleicht ganz gut vergleichen bei der Tischkultur. Wir haben bei der Tischkultur im Sinne einer Entscheidung gesagt: Okay, wir setzen bestimmte Softwarelösungen ein, wenn wir mal eine E-Shop-Lösung machen. Jetzt kam es […] vorletztes Jahr [dazu], dass man das Thema Relevanz am Point of Sale im Sinne einer Internetpräsenz sehr hoch bewertet hat und sagte, da kommt ein Markt, da müssen wir unbedingt was tun. Also haben wir im Sinne der Projekt-Roadmap dieses Thema hoch priorisiert […]	Prioritizing investments for business strategy and competitive position: ensure that business strategy priorities are also seen in resource allocations Resource planning for IT

Table 24: Investment decisions - interpretation of decisions and reasoning

f. **BUDGETARY DECISIONS** concern the overall volume of the budget for IP as well as the general apportionment of the budget to business areas or to budget categories, such as personnel, hardware/software investments, external service provision, etc. The questions here are "How much do we want to spend on IP?" and "How do we want to distribute the overall budget to different categories?" (in contrast to "Which concrete initiatives should we fund?"): "[here, we decide that] we use […] 70% of our resources directly for business areas and we use 30% of our resources for the infrastructure" (case 4). These decisions were mentioned in cases 3, 4, 5, 10, and 14.

These decisions were argued to be strategic due to the uncertainty inherent in setting priorities over a long period of time and apportioning large sums; money is a resource that has to be planned and prioritized in order to be used optimally.

Determining the size of the IP budget was seen as a decision that is **made under uncertainty** from the IT executive's perspective (case 3): it has to be decided how much money to spend without knowing how much will be available or necessary (case 3).

As the budget is the amount of money that will be spent on IP, the decision to set its size was seen to be about a **resource that has to be planned** (case 10) **and optimized**, especially because it has to be regulated if it is not spent wisely (case 5).

Deciding on the distribution of the budget was argued as strategic because it involves **setting priorities for main themes** (e.g. business units or business initiatives, but not yet concrete projects) **over a longer time period** (three to five years) (case 4). In this sense, setting these main themes through allocating budget to them is not only a work-plan but also represents a longer-term commitment. Here, the decisions on the budget distribution and on concrete investments are linked: we categorized the prioritization of concrete initiatives as an investment decision and the mere distribution of resources to business units (who then decide on the actual investment) as belonging to the budget decision.

Case	Decision quote	Decision summary	Context/detail quote	Context/ detail summary	Reason quote	Reason summary
3	712: Setting the IT budget	Setting the IT budget			719: Das ist total strategisch. […] 727: Ja, unter der Definition: Strategisch: ich entscheide etwas unter unklaren Rahmenbedingungen. Ich musste ja entscheiden […] ohne zu wissen, ob mein Budget durchkommt. Hätte ja sein können, der streicht mir mein Budget auf die Hälfte zusammen, dann sieht's aber dumm aus. Dann habe ich Aussagen meinen Kunden ggü. getroffen, die ich aber nicht finanzieren kann. 735: weil es enthält Komponenten wie Unwägbarkeit, aber ist am Ende doch sehr konkret, weil ich habe genau einen Headcount, die Aufwände, Abschreibungen, Materialkosten, etc. pp.	Decided under uncertainty
4	186ff: Und da steht schon und wir setzen einen besonderen Fokus hier drauf und wir setzen einen besonderen Fokus da drauf, aber es ist nicht eine Listung von einzelnen Projekten, dass wäre jetzt auf der nächsten Ebene. […] Das wäre nicht mehr strategisch! […] durchaus sagen/sein, wir setzen 60% unserer Ressourcen oder 70% aus unseren Ressourcen, direkt Business Area-wirksam ein und wir setzen 30% unserer Ressourcen für die Infrastruktur ein.[...] Die [Business Area wirksamen] könnten Sie noch mal unterteilen und sagen: wir setzen 30% unseres Portfolios für das Thema „Geldmengensteuerung" ein.	Allocating the amount of resources to business areas	164: und umfasst […] ein analytisches Portfolio, wir müssen Informationen über alles und jedes zur Verfügung stellen, ein Transaktionsportfolio, wir machen die Geldversorgung oder steuern die Geldversorgung in Europa, mit allem was daran hängt, ein Transaktionsportfolio 2, wir stellen zur Verfügung die Banknotenversorgung in Europa oder steuern die, ein [...] Transaktionsportfolio 3, [...] wir stellen unsere internen Servicesysteme zur Verfügung [...] und letztlich ein Infrastrukturportfolio, wir stellen die darunter liegende Infrastruktur europaweit zur Verfügung. 186: Wenn Sie so wollen, sind es 2 Dimensionen, es ist einmal in welchen Feldern, und das sind diese Portfolien und das andere ist: wie tief […] und wie tief heißt, wir entwickeln, wir machen Maintanance, wir stellen die Betriebsservices zur Verfügung […]	Each business unit has a separate portfolio (i.e. this decision is one level above the portfolio level) The budget has two dimensions: business units and services	212: folgende Schwerpunkte in einem Mehrjahresplan. Eine Strategie schaut über 3-4 Jahre. Oder sagen wir mal 3-5 Jahre, so in der Größenordnung	Long-term plan

Case	Decision quote	Decision summary	Context/detail quote	Context/ detail summary	Reason quote	Reason summary
5	213: das IT Budget […] Natürlich strategischer Bestandteil. Vor allen Dingen wenn Sie sagen wir mal den Eindruck haben, dass das Budget nicht an jeder Ecke optimal eingesetzt wird Redundanzen, keine Standards etc. Aber jetzt unter dem Aspekt, ist ein hohes oder niedriges IT Budget gut, das ist bei uns nicht so sehr im Fokus, sondern wirklich die Frage, setz ich es heute wirklich wertbringend ein das IT Budget.	Is the IT budget being used in the right way?	213: das IT Budget […] Natürlich strategischer Bestandteil. Vor allen Dingen wenn Sie sagen wir mal den Eindruck haben, dass das Budget nicht an jeder Ecke optimal eingesetzt wird Redundanzen, keine Standards etc. Aber jetzt unter dem Aspekt, ist ein hohes oder niedriges IT Budget gut, das ist bei uns nicht so sehr im Fokus, sondern wirklich die Frage, setz ich es heute wirklich wertbringend ein das IT Budget.	The size of the IT budget is not viewed as a strategic decision in this case	213: Natürlich strategischer Bestandteil. Vor allen Dingen wenn Sie sagen wir mal den Eindruck haben, dass das Budget nicht an jeder Ecke optimal eingesetzt wird Redundanzen, keine Standards etc. Aber jetzt unter dem Aspekt, ist ein hohes oder niedriges IT Budget gut, das ist bei uns nicht so sehr im Fokus, sondern wirklich die Frage, setz ich es heute wirklich wertbringend ein das IT Budget.	
10	1033: Dann gibt's ein Pricing von den Kosten, die wir im IT-Bereich haben. Nach dem Motto: Das sind die bis jetzt aufgelaufenen Kosten, wie sieht es fürs nächste Jahr aus? Was glauben wir, wie sich die Kosten entwickeln werden? Ich habe zwar feste Verträge, aber da sind die Kosten natürlich auch variabel, weil wir natürlich uns komplett im Outsourcing bewegen. Umso mehr Last drauf kommt, um so mehr muss ich bezahlen.	Forecast of how much will be spent on IT next year	-	-	-	-

Table 25: Budgetary decisions - interpretation of decisions and reasoning

g. **DECISIONS ON LAUNCHING IS/IT PROJECTS THAT DIRECTLY SUPPORT MARKET ACTIVITIES** entail engaging in individual projects that are considered relevant for the market-oriented business strategy (cases 6, 13): "[Whether introducing an application is strategic] depends on what we are talking about. If we're talking about an accounting reporting software, then I'd say that cannot be strategic […] If it is really [an application for] business scope extension […], then it takes on strategic relevance" (case 6).

The reason for viewing such a decision as strategic is thus due to the fact that it **supports the business strategy** in that the projects form part of a market-oriented initiative (e.g. introducing a new product). In case 6, the project supported introducing a new financial product. In case 13, the project supported a new online distribution channel.

However, the introduction of applications for new products or markets was also seen as having a strategic component, because these kinds of applications would introduce functional overlaps with other applications (case 6). For example, an application to support a new product might have overlaps in the billing functionality with applications supporting other products. These **overlaps introduce inconsistencies and redundancies into the application landscape** and require overhauling the landscape in its entirety (see decision area a).

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
6	479: ne Geschäftsfelder-weiterung ist, relevante Geschäftsfelderweiterung […] und das auch resultiert in neue Applikationen	Introducing new applications that support new products	Reason quote: 469: Also sobald es natürlich neue Geschäftsfelder, neue Ausrichtungen, damit verbunden neue Akquisitionen sind, dann sind diese schon strategisch, weil die haben natürlich auch von Ihrer Auswirkung her, eine große Relevanz. Kommt natürlich immer drauf an, was reden wir, wenn wir jetzt von einer Buchhaltungsreportingsoftware reden, dann sag ich also, das kann kaum strategisch sein [...] Wenn es wirklich ne Geschäftsfelderweiterung ist, relevante Geschäftsfelderweiterung[...] dann hat das sehr schnell strategische Relevanz, weil dann denkt man grundsätzlich noch mal über die ganze Applikationslandschaft nach. Weil dann kommen ja Überlappungen und dann sind sie immer mit funktionalen Überlappungen konfrontiert und die gilt es zu identifizieren und dann gibt es die neue Applikationslandschaft zu zeichnen			Supporting business strategy changes (new products, new areas of business) Introducing new applications for new businesses leads to rethinking the application landscape because of functional overlaps
13	349: Projekt Roadmap […] pro Unternehmensbereich 345: Menge von Applikationen, die sozusagen eingeführt werden soll	Decision on application portfolio by BU	-	-	462: So versuchen wir dann im […] die strategische Relevanz für den Unternehmensbereich zu adressieren, also zu sagen, das haben wir ... Man kann es vielleicht ganz gut vergleichen bei der [BU 1]. Wir haben bei der [BU 1] im Sinne einer Entscheidung gesagt: Okay, wir setzen bestimmte Softwarelösungen ein, wenn wir mal eine E-Shop-Lösung machen. Jetzt kam es […] vorletztes Jahr [dazu], dass man das Thema Relevanz am Point of Sale im Sinne einer Internetpräsenz sehr hoch bewertet hat und sagte, da kommt ein Markt, da müssen wir unbedingt was tun. Also haben wir im Sinne der Projekt-Roadmap dieses Thema hoch priorisiert […]	Investing in projects that support business strategy opportunities

Table 26: Launching IP-based market-oriented projects - interpretation of decisions and reasoning

h. **HUMAN RESOURCES AND ORGANIZATIONAL PLANS OF THE IT UNIT**: Like any organizational unit, the IT unit needs human resources, which need to be organized so that the required activities can be executed. The decisions related to these resources are laid down in the human resources and organizational plans of the IT unit**.** Decisions include the IT unit's organization into sub-units, its personnel, and their skills: "How do we develop our [the IT unit's] employees, which core competencies do we see in our employees, and how do we ensure employee training?" (case 13). In detail, the decisions were:

- Decision on which skills are important for IP staff (cases 6, 12, 13)
- Decision on which skills are needed in which quantity (skill gap) and from which source
    - Decision on filling the gap with internal skill development vs. external recruitment (case 4c)
    - Decision on introducing and defining skill development for IP staff roles (case 4e)
- Determining the organization of the IT unit (case 4b)
- Decision on introducing limited contracts for IP staff (case 4d)
- Determining important cultural values for the IT unit (case 4a)

Reasons for viewing these decisions as strategic were rare and differed significantly from case to case. However, IP staff was generally regarded as a very (if not the most) important resource of the IT department.

As with financial resources in budgetary decisions, **human resources have to be planned carefully** in order to know how many people are needed, which skills are required, and whether hiring should be done from outside or if inside employees should be trained (case 4c). Careful planning is important, as the decisions made are **not easy to reverse**: once staff is hired or trained in a certain skill, these skills cannot be adapted easily because training takes time and people cannot be hired or laid off quickly (case 4e). Hence, measures that **address this irreversibility** are also included in the information strategy, such as the decision to employ people in fixed-term contracts only (case 4d).

Otherwise, IT staff was argued as being **central to the implementation of information strategy**, regardless of what the strategy entails (case 6).

In case 13, the **term "core competency" was applied** to the "competencies" of the IT unit's personnel, which included "speaking English fluently" or "project management skills." Here, the essence of core competencies – i.e. competencies that a company bases its business on – is transferred to the IT unit and refers to the most important skills that IT unit staff must possess. This is an instance of reasoning by analogy, in which the original context (make decisions on the scope of the business on the basis of core competencies rather than on market attractiveness) gets lost in the shuffle. That means that the strategic business decision (scope expansion) is no longer present or got turned into the scope of the IT unit (what kinds of services the IT unit can provide).

Finally, decisions on values were seen as strategic, because they represented a **major shift in how the IT department operates**. In case 4a, the "working mode" within the company was to "get things done quickly" in a "wild west manner." Once the overall goal of the organization was achieved and a phase of more stable operations had been reached, it was recognized that this approach was leading to silos, as employees were only working on their individual duties. As this was perceived as dysfunctional over the long term, a new culture that fostered teamwork across these silos had to be instilled.

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
4a	22: Culture, Values and Communication wird oft vergessen im Rahmen einer Strategie, ist aber ein wichtiges Thema	Decision about the culture and values of the IS unit's staff	641: . Also das fängt ja damit an, was ist Kultur? […] Das sind Werte, Denkhaltungen, die übersetzt werden in Regelwerke, die mit Anreizen und Bestrafungen versehen werden, um für eine gewisse Einhaltung zu sorgen. 648: Wir definieren da für uns schlicht weg Kultur auf der strategischen Ebene, eher im Prozesssinne, also wir setzen uns regelmäßig zusammen als Management und geben gewisse Verhaltensdevisen aus, die wir beispielhaft vorleben wollen und von denen wir wollen, dass die Mitarbeiter denen folgen. 664: […] im Augenblick wichtigste Kulturthema an dem wir arbeiten, ist Teamarbeit quer zu den Einheiten. So und dann ist die strategische Devise momentan dieses müssen wir als Managementgruppe vorleben	Which values and desired behaviors should be adopted by IS staff members	658: Die Bank musst als Start up entstehen ein bisschen in Wild West Manier. [...] Sie konnten nicht lange drüber nachdenken innerhalb weniger Jahre musste der Euro zum laufen gebracht werden. Die einzelnen Unternehmensbereiche sind vormaschiert und haben ihre Teile der Lösungen beigetragen ohne all zuviel Abstimmung. Damit sind Kamine entstanden. Ging nicht anders. Dieses muss man jetzt aber ändern bei dieser Größe der Organisation, in dem mal formal Prozess quer legt, informell Teamarbeit fördert.	Counter measure to ensure a sustainable modus operandi for the IT unit (in teams rather than in silos)
4b	399: Delivery Organisation and Processes beschreibt dann: da gestalten wir sozusagen, wie bauen wir unsere Aufbau- und Prozessorganisation auf.	Decisions about the static organization of the IS unit	400: Das sind die typischen Themen, die kennt jeder, das und das ist unsere Linienstruktur.	Decision on the departmental structure	-	-
4c	447: die wichtigste Ressource, die wir haben, nämlich unsere eigenen Mitarbeiter.	Decisions about the IS staffs and their skills	448: Und das Kernthema hier ist eigentlich Entwicklungsplanung. Basierend auf, wir haben letztlich die Themen, was brauche ich, was habe ich. Als erstes machen Sie natürlich das Thema irgendwo auch Recruitment Planung: was wollen wir uns reinholen, wie entwickeln wir die Leute […] wie phasen wir sie denn Notfalls auch mal aus, wenn die Performance anders ist,	What kind of skills are needed and which ones are present: where new IS staff members should be recruited	-	Resource planning for human resources

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
			als wir sie uns vorstellen.			
4d	453: die neuen Arbeitsverträge – sicher auch ein sehr sehr strategisches Element hier – nur noch auf 3 oder 5 Jahre laufen. Das gibt keine Dauerverträge mehr. Jetzt seit Kurzem.	Decision that IS staff contracts are only fixed-term	-	-	454: Jetzt seit Kurzem. 448ff: […] Ist sehr schwierig hier in dieser Bank wie phasen wir sie denn Notfalls auch mal aus, wenn die Performance anders ist, als wir sie uns vorstellen.	Is a new, complete innovation for a public organization; counters irreversibility
4e	456: aus den oberen Elementen [Market und Product architecture] kommt quasi, was brauchen wir an Leuten und wo wollen wir die einsetzen. Aus dem Staffelement kommt dann raus, was haben wir an Leuten und an Skills und da werden dann Entwicklungspläne gemacht. Auf der Ebene Strategie wird beschlossen: wir machen Entwicklungspläne und die haben die und die Dimensionen. In der Umsetzung wird dann beschlossen: und der einzelne Mitarbeiter ist in dem Entwicklungsplan jetzt in diesem Stadium und wenn er entwickelt wird in den nächsten 3-4 Jahren, dann sollte er das und das lernen und sich durch die und die Einheiten bewegen und so. [...] auf Strategieebene wird aber pro Rolle sag ich mal beschlossen, wie die Entwicklung ist oder für einen Architekt meinetwegen sieht das so und so aus und der muss folgende Dinge haben	Decision to use skill development plans and related skills for each role within the IS department.	-	-	564: ich entwickle Staff in eine bestimmte Richtung, die Richtung kann ich nicht ohne weiteres rückgängig machen. Die Leute sind dann erstmal dort.	Long-term binding, irreversible resource allocations
6	528: Also wenn die IT oder wenn	Deciding			531: und je besser diese Fähigkeiten	Important for

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	die IT-Mitarbeiter mit ihren Fähigkeiten nicht strategisch wären, dann wäre die ganze Strategie und die Relevanz, dass IT strategisch in einem Unternehmen wäre, nicht mehr da. Also für mich sind die absolut […] das ist der Kernpunkt, die Mitarbeiter und Ihre Fähigkeiten […]	on skill requirements and how to attain them			sind, desto einfacher ist unsere Ausrichtung, egal ob nach links oder nach rechts, umsetzbar. Und da investieren wir auch relativ viel in der Ausbildung z.B. der Mitarbeiter, also da gibt's z.B. bei unserem Co-Banking-System diese Zertifizierung und diese Zertifizierung, das ist für mich absolut key, dass unsere Mitarbeiter das durchlaufen	strategy implementation Means huge investments
12	None	Decisions on IT employees and their qualification	None	Skills, training, etc.	None	None
13	327: wie entwickeln wir unsere Mitarbeiter, welche Kernkompetenzen sehen wir bei unseren Mitarbeitern, wie stellen wir die Mitarbeiter-ausbildung sicher, wie stellen wir das Management, die Qualifikation des Managements sicher. Das sind also mehrere Themen, wie wir vom Management und Personal und letztendlich aufstellen	What are the core competencies of the IT staff and management?	336: Als Kernkompetenz würden wir sagen, wir sehen Projektmanagement als eine Kernkompetenz für einen IT-Mitarbeiter. Wir sehen ein kommunikationssicheres Englisch als eine Kernkompetenz. Wir sehen eine Prozesskompetenz als Kernkompetenz.	Core competencies of the IT staff are: - Project management skills - Fluent English - Process knowledge	-	Analogy to business strategy concept

Table 27: HR and organizational plans for the IT unit - interpretation of decisions and reasoning

i. **DECISIONS ON THE ROLE OF THE IT UNIT** determine its self-conception (e.g. as a service provider, technologist, consultant, etc.). These decisions affect the positioning of the IT unit towards the business areas and the board of directors, towards its employees and external stakeholders (such as external customers; e.g. should the IT unit serve the external market or not), and potential competitors for providing IT services (e.g. "providing services at a competitive price with ongoing benchmarking" (cf. case 13)). The purpose of these decisions is marketing the IT unit to different stakeholders: "the mission expresses in which area we [the IT unit] are active. The vision [of the IT unit] […] is the eventual expression of strategy, which by the way is a very attractive vision for the employees [of the IT unit] here, really showing a way forward" (case 4). The decisions subsumed in this decision area were:

- Determining the mission/vision of the IT unit (cases 4a, 4b)
- Determining the role of the IT unit (i.e. its self-conception as a service provider vs. technologist vs. consultant vs. business driver) (cases 2, 3a)
- Determining certain principles for the IT unit (e.g. whether it should be benchmarked and try to be cost-efficient/competitive with external providers) (case 13)
- Determining the customers that the IT unit serves and the products/services it provides (cases 4c, 4d)
- Should the IT unit also serve the external market with its IT products and services? (case 3b)

These decisions were argued to be strategic because explicating the role of the IT unit (e.g. as a service provider) is seen as important for **gaining acceptance from users** (case 3a), which is critical for the implementation of any strategy. These decisions also lay a **common ground** for all internal stakeholders, who can relate to a set of common principles (case 13).

In addition, these are the **most fundamental decisions** for the IT unit (cases 3, 4a, b, c, d). In the same way that defining the mission, vision, goals, and scope (i.e. customers and products) of a company define what it is about, the same can be said of the mission, vision, and scope for any of the company's units, including the IT unit. Hence, the argument is that these are the most essential decisions in a strategy, or "the eventual expression of strategy" (case 4). Strategies are believed to include decisions like the ones mentioned. The reasoning here resembles the **analogy to business strategy** (case 4): just as a busi-

ness needs a business strategy, the IT department needs an information strategy. Both strategies include the same decisions, to be applied to the whole company or to the IT unit, respectively.

Finally, the decision to let the IT unit also serve the external market **alters the scope of the overall company** and hence **changes its business strategy**: with this decision, the company has extended its lines of business to the IT service or product market (case 3b).

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
2	309: […] dass IT die Rolle eines Dienstleisters einnehmen will und soll. Vor 4 Jahren Gegenstand unserer strategischen Entwicklung gewesen.	Decision on the role of the IT unit	-	-	-	-
3a	140: also sagen wir mal so: das Selbstverständnis der IT, so würde ich es mal nennen. Wie agiert IT im Konzern? Welche Rechte und welche Pflichten hat es?	Determining the role of the IT unit within the company	143:Ist es eine Abteilung die Standards setzt und Standards auch entsprechend durchdrückt? Oder ist es eher eine Abteilung beispielsweise die Standards vorschlägt und über den Vorstand eskaliert? Ist es eine Abteilung die eben ein reines Cost center ist es ein Profit center, verrechnet sie ihre Leistung, verrechnet sie sie nicht ihre Leistung, gibt's Service Level, gibt es Pönalen bei Service Level Über- oder Unterschreitung? Das sehe ich alles unter IT Selbstverständnis. Governance ist so ein bisschen abgedroschen. Selbstverständnis der IT. Also wie betreibe ich IT. Jetzt nicht technisch, nicht funktional, sondern vom Selbstverständnis her innerhalb eines Konzerns. 173: unser […] Modell – auch um Akzeptanz zu gewinnen – ist ein dienstleistungsorientiertes	Defines the role of the IT unit vis-à-vis the business units (e.g. service provider vs. innovator, cost vs. profit center	38: Man muss dazu sagen, man hatte auch versucht im Vorfeld viele solcher Strategien zu entwickeln. […] Ja das waren soviele Ansätze, aber die sind alle im Wesentlichen an folgenden Punkten gescheitert. Erstens: Kein Buy-in der Anwender 165: Weil es für mich in der Mengelage ein ganz wichtiger Aspekt war in der Verbindung: ich hab jetzt ne Anwendungslandschaft, die ich gerne einführen würde. Wie mache ich das am besten. Unter welcher Rahmenbedingung mach ich das. Das heißt, das bedingt sich in irgendeiner Form. [...] unser […] Modell – auch um Akzeptanz zu gewinnen – ist ein dienstleistungsorientiertes. 195: dass man zwar mit viel Mühe, aber doch die Anwender hinter sich bekommen konnte […]	It is important to obtain buy-in/acceptance from users. The role of the IT unit is an important determinant of this acceptance Important for implementing the strategy Trade-off between gaining acceptance from and regulating business units
3b	215: das war jetzt auch wieder ne strategische Fragestellung 281: So, zu sagen o.k. wo ist ein Markt, wo [company] tätig ist, wo auch IT eine Rolle spielt: Healthcare – fein,	Decision that the IT unit will serve the external market, i.e. that IT becomes a business unit in itself	288: Projektleistung und sogar ein eigenes Produkt. Wir haben wirklich eine Firma kreiert und haben unser eigenes Produkt versucht zu positionieren.	IT unit offers services and a product to external clients	319: Ja wir haben gesagt hier, aus den drei Geschäftsfeldern werden vier. 599: Was ich dann aber wirklich wieder als Strategiezäsur ansehen würde, wäre die Ausgründung, […] die komplette, sagen wir noch mal Neuausrichtung meines Bereiches	Extends the scope of the company, spawns a new business Is a dramatic change of direction for

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	Krankenhäuser sind ein hochproblematischer Bereich, keine richtige DV Lösung, also wir gehen mit [IT unit] ganz bewusst in diesen Healthcare Dienstleistungsmarkt.					the IT unit
4a	17: Für uns hat IS Strategie immer letztlich diese 8 Aspekte […] Mission & Vision […]	Determining the mission of the IS unit	122: Bei uns ist die Mission relativ einfach: Wir stellen alle Informationstechnikdienstleistungen zur Verfügung, sowohl was die Entwicklung und Maintenance von Applikationen angeht, als auch was den Betrieb angeht; für im Wesentlichen 2 Kundengruppen: das Eine ist die [case organiation's name] und das andere ist das Netz der Nationalen Notenbank für die gemeinsamen Anwendungen 115: Ja, das ist die Mission und Vision von [IS unit's name], die kompatibel sein muss, mit der Mission und Vision der Bank. […] die Mission der Bank [...] Und daraus abgeleitet werden dann die Missions der einzelnen Business Areas [and the IT unit is one of them]	Determining the IS unit's customer groups and services provided to them by the IS unit The mission of the company gets broken down into missions for each function	145: Ja ich würde mal einfach sagen, weil die Mission drückt aus, in welchem Feld sind wir tätig. Die Vision drückt aus, was ist unsere Zielsetzung für 5 Jahre von heute in diesem Feld und für mich ist das der Treiber von Strategie. Also oder der letzte Ausdruck von Strategie	Determines field of activity/scope of the IT unit
4b	17: Für uns hat IS Strategie immer letztlich diese 8 Aspekte […] Mission & Vision […]	Determining the role (vision) of the IS unit	129: Vision sagt ja immer, wo wollen wir hin, wo sehen wir uns in Zukunft. Die Vision heißt, wir sehen uns als Captain, […] auf der Ecke IT. Also wir sehen uns als der Captain für alle IT Fragen im Bereich Europa […].	Determining the future role of the IS unit towards its customer groups Role of IS unit is coordination and control among customers	145: Ja ich würde mal einfach sagen, weil die Mission drückt aus, in welchem Feld sind wir tätig. Die Vision drückt aus, was ist unsere Zielsetzung für 5 Jahre von heute in diesem Feld und für mich ist das der Treiber von Strategie. Also oder der letzte Ausdruck von Strategie	Determines future (long-term) goals of the IT unit
4c	155: Der Markt als Element strategischer Be-	Determining the customers	32: Ja der Kunde sind die Fachabteilungen, sowohl innerhalb der [organization's name] aber	Departmental view: the cus-	-	Determines the customers of

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	trachtung: das ist die Frage welche Kunden haben wir, mit welchen Produkten wollen wir die versorgen.	of the IS unit	auch die nationalen Notenbanken, sind potentiell Polizeibehörden, rund um die Welt ist potentiell die Fed, die Bank of Japan, also alle für wir die letztlich direkt oder indirekt Informationsdienstleistungen erbringen. [...] Wir [IS unit's name].	tomers are the customers of the IS unit		the IT unit
4d	162: Und bei den Produkten können Sie es dann entsprechend durchdeklinieren [...] Das sind unsere Produktfelder.	Determining the products of the IS unit	186: Wenn Sie so wollen, sind es 2 Dimensionen, es ist einmal in welchen Feldern, und das sind diese Portfolien und das andere ist: wie tief. [...] Gruppen von Fachbereichen [...] Und das andere ist wie tief und wie tief heißt, wir entwickeln, wir machen Maintanance, wir stellen die Betriebsservices zur Verfügung und die Betriebsservices, ja da kommen wir dann, auf das was sie letztlich sagen.	The products are the IS services provided for various customers	-	-
13	124: Also erstens haben wir eine Vision, sage ich mal, die besteht aus vier Kernsätzen, was die IT bei [company] ausmachen soll. 134: die Positionierung, die sich letztendlich [company] für die IT vorstellt	Vision defines the role of IT	149: wir wollen Standardsoftware einsetzen, wir definieren uns aus einer optimalen Unterstützung der Geschäftsprozesse, wir betrachten Security, allerdings in einem vernünftigen Kosten-Leistungs-Verhältnis, wir unterstellen uns einem konsequenten Benchmarking und wollen wettbewerbsfähige Leistungen zu ... Ich sage mal, wir wollen keine Pioniere sein in der IT.	The vision consists of normative guiding principles	906: Die Schweden haben uns gefragt Warum machen wir das überhaupt? Und ich konnte eigentlich keine Antwort drauf geben. […] Aber dann sind wir gekommen und haben gesagt: Ja, aber wir wollen doch als Shared-Service-Organisation eine gleiche betriebswirtschaftliche Software-Landscape eigentlich über alle Standorte aufbauen. […] Und dann kam: Ah, ja, stimmt. […] Und so kam man eigentlich dann in eine Gesamterklärung.	Provides a guideline for subsequent decisions Is a common frame of reference (set of principles) that one can rely on to reach consensus

Table 28: Role of the IT unit - interpretation of decisions and reasoning

j. **RIGHTS AND ACCOUNTABILITY DECISIONS** regulate the way in which (other) IP decisions are made within the organization. First and foremost, this involves the distribution of internal responsibilities for decision rights among different stakeholders within the overall organization and thus goes beyond the IT unit itself. This distribution might be among the IT unit and business stakeholders as well as among corporate- and business unit-level stakeholders. Rights and accountability decisions also include the introduction of IT control mechanisms, such as introducing service level agreements (SLAs) or charge-back provisions for IT services: "I […] always see IT strategy in connection with governance. […] it determines who is allowed to do what, how budgets are determined, investments, all these regulations" (case 8). The decisions in detail were:

- Allocating responsibilities for IP decisions between corporate and business units (centralization vs. decentralization) (cases 5c, 6a, 7, 8, 9)
- Allocating responsibilities for specific IP decisions between the IT unit and business management (e.g. for decisions on budget, application portfolio) (cases 2, 3b, 6b, 9)
- Introduction of IP control mechanisms (e.g. charging mechanisms for IP services, SLAs, performance measurement, decision committees, and criteria for prioritizing, steering the IT unit as a cost or profit center or shared service center, etc.) (cases 3a, 4, 5a, 5b, 6b, 8, 11, 13)

Choosing between decentralizing and centralizing decision rights was regarded as strategic because the decision **has to be brought in congruence with a given business strategy** (cases 6a, 7, 8). For example, in case 8, a high cost pressure was reported, and the responsibilities for IP decisions were hence centralized. Once the company changes to a growth strategy, decision rights will be decentralized again.

Allocating decision rights between business units and the IT unit as well as between the corporate level and business units incentivizes business units to act in a desired way. On the other hand, decisions on the rights and responsibilities represent rules that have to be adhered to company-wide (cases 6, 9, 13). These decisions were seen as strategic because they **regulate or control business units** (cases 7, 8). This is regarded as a measure for **countering the "entropy"** (case 8) that business units cause if left unregulated due to their claimed inherent interest in being different from other business units. It also helps to ensure that **business units act to benefit the whole group** rather than solely act in their own interest (cases 3, 5b, 5c, 8). This is done with the aim of **gaining synergies** (case 7) and **staying cost-competitive** (case 5).

At the same time, giving responsibilities to business units (i.e. regulating them less) helped them to **better satisfy business requirements** and **stay agile and flexible** (case 6). In case 6, the business strategy entailed geographic expansion. It was regarded important that the unit could make platform decisions independently from the corporate-wide standard. Not being forced to conform to the group-wide standard allowed for unbureaucratic and hence quicker adjustments for certain countries. If the group-wide standard had been used, this would have meant long rounds of syndication with the group. However, a latent reason behind not following the group-wide standard was also **politically motivated**: it was considered important by the managers of the company to be independent from the group.

Giving business units control over IP decisions was also argued to help in **gaining acceptance from the business units** (case 3) or to **better satisfy business requirements** (case 2) and also played a central role as a **facilitator for implementing** other strategy decisions (case 3). Involving business units in IT decisions and introducing performance measurement decisions was also a reaction to **address the business units' criticism of the intransparency** of IP decisions and the IT unit's performance (cases 4, 6).

Besides that, decisions to introduce certain control mechanisms (such as SLAs) constitute a **long-term plan** that can only be implemented in 3-5 years (case 11). Initiatives such as score cards for measuring the performance of the IT unit influence how people act; hence, the metrics cannot be changed every year, which makes them **not easily reversible** (case 4). In case 4, the decision to introduce an IP performance measurement system was argued to be part of information strategy also because it was completely new (an innovation) to the whole institution. It hence was said to require special attention as it was regarded to set a company-wide precedence.

Case #	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
2	76: Im Grunde genommen beschäftigt man sich in der IT oder sollte man sich beschäftigen und haben wir eben deshalb auch getan immer mit der Frage: A) wie steuern wir uns und wie werden wir gesteuert und B) […]	Decision on how to steer the IT unit	394: Das regelt sich also sozusagen von selbst 421: Ausrichtung an den Geschäftszielen des UN's ist ja immer da durch die Fachbereiche 184: […] früher als es die Budgets noch nicht gab,[…] gab es eine Institution die nannte sich Bewertungskommission. Da wurden […] Projektanträge eingereicht, so viele wie man zusammen bekam[…] Und dann wurden eben von denen […] so viele ins Portfolio aufgenommen, bis das Budget bzw. die Kapazitäten der IT aufgebraucht waren. So das machen wir nicht mehr, weil durch die betriebswirtschaftliche Steuerung über Budgets das Ranking jetzt praktisch jeder Fachbereich für sich macht.	Decision rights for budget and application choices is made in a feudal fashion (each business unit decides for itself)	239: sich die Entwicklung sehr stark an Geschäftszielen, Unternehmenszielen ausrichtet 301: Die strategische Planung berücksichtigt nahezu ausschließlich Geschäftsanforderungen 184ff: […] Was klar erschwert fachbereichsübergreifende Themen anzugehen. Was aber ansonsten im Grunde genommen schon die Ehrlichkeit in den Bewertungen eher verbessert.	IP decision rights are made to give power to business units; IT unit is only service provider (decentralized power) Change in governance was needed to decrease "I want a big share of the cake" mentality: incentivize business units to act in an economic way
3a, 3b	125: es gibt noch eine dritte Komponente, die wir gleich mit abgefrühstückt haben: das war das ganze Thema IT Governance. 140: IT Governance […] Welche Rechte und welche Pflichten hat [the IT unit]?	Determining the role of the IT unit within the company	143ff:[…] verrechnet [the IT unit] ihre Leistung, verrechnet sie sie nicht ihre Leistung, gibt's Service Level, gibt es Pönalen bei Service Level Über- oder Unterschreitung? 126: Das haben wir aber in 2 Stufen gemacht. Die 1. Stufe war […] die IT als interner Dienstleister auszurichten. Das war ne klare Governance-Entscheidung. Also eine Entscheidung gegen ein Cost-plus Modell, gegen ein Modell IT kostet nichts, […] die 2. Runde der Governance: eben zu sagen, wir zentralisieren die EDV über der Maßgabe einer zentralen Anwendungslandschaft und einer zentralen Infrastruktur […]	3a: Defines which governance mechanisms (SLAs, charge-backs) are used 3b: Determines centralization of decisions in IT application landscape and infrastructure	205: Das heißt wir haben immer versucht, ich nenn das immer so schön Kaufkraft meiner Anwender abzuschöpfen, damit die auf keine dummen Ideen kommen. 227: So, also Governance-Regel war eindeutig	Allows regulation of the business units and drives them in a desired direction

Case #	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
4	568: So bleibt das Performance Management, das wir im Rahmen von Strategie besonders […] hervorgehoben haben, weil die Bank es historisch nicht hatte 573: Diese Score Card ist Teil der Strategie, haben wir wirklich gesagt, die inklusive der Metriken sogar.	Decision to introduce a scorecard of IT unit's performance and on the specific metrics of this scorecard	570: Also haben wir gesagt: wir bauen über all diese Dinger hinweg, einen formalen Regelprozess auf. Und das ist ne Score Card, die hat momentan 28 Metriken, also Obermetriken und da hängen dann weitere Metriken drunter.	Scorecard is a set of metrics for the performance of the IS unit	568: […] im Rahmen von Strategie besonders deshalb hervorgehoben haben, weil die Bank es historisch nicht hatte. Deshalb haben wir gesagt, es hat eigenständig den Wert, auf Ebene Strategie gehoben zu werden. 612: wenn Sie es entscheiden, legen Sie sich in der Auswirkung auf jedenfall für 3 Jahre fest, selbst wenn ich es nach 1 Jahr wieder ändere, mache ich ja nicht rückgängig, das was im letzten Jahr war, wo ich z.B. Staff in eine bestimmte Richtung entwickelt habe. Ich hab Skills geschaffen, die würde ich jetzt vernichten, wenn ich radikal in eine andere Richtung gehe.	New to the organisation (innovation) Long-term binding, irreversible because it influences subsequent actions
5a	163: Dann aber aber auch jetzt hier im Konzern die Frage: wie steuere ich den internen IT Dienstleister, steuere ich den internen IT Dienstleister im Prinzip als Costcentre oder steuere ich ihn als Profit Center oder eigenständige Geschäftseinheit?	How should we steer the internal IT provider?	-	-	-	-
5b	283: […] Standards festlegen[… zur] IT Projektsteuerung und Projektportfoliosteuerung. Dass ein Projekt mit ganz klaren Kriterien nur gestartet werden darf […] auch regelmäßig auf den Prüfstand kommt, dass es […] regelmäßige Ampelberichte […] gibt […] auch Standards	Guidelines for how certain management processes should be conducted (criteria, etc.)			309: diese Fragen [...] spielen für mich eher rein in eine Effizienz der IT und sind von daher auch mit dem Anteil den die IT Kosten ausmachen strategisch, da reden wir einfach über einen strategisch wichtigen Kostenblock, aber eigentlich mit zweiter Priorität	Synergy/efficiency, less wasted money

Case #	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	Richtung Budgetierungsprozess […]					
5c	261: D.h. eine Organisationsdebatte die bei uns im Augenblick ansteht, ist […] die Frage, wie können wir intelligent und geschickt Verantwortlichkeiten der IT dezentral allokieren, die aber dann für den Gesamtkonzern zuständig sind […] klassisches Thema IT Governance Auftraggeber-seitig.	Decision on allocation responsibilities centrally or decentrally			261ff: […], wie können wir intelligent und geschickt Verantwortlichkeiten der IT dezentral allokieren, die aber dann für den Gesamtkonzern zuständig sin	Incentivizing business units to act cooperatively rather than only to benefit themselves
6a	61: Jetzt strategisch […] ist die IT denke ich, […] die Bewahrung der Unabhängigkeit gegenüber der Gruppe, Sie wissen wir sind [group]-Group, das hat eine gewisse Brisanz [...] [company]bank hat mit der Entscheidung 1998/1999, ihre Core-Applikationen zu erneuern und zwar nicht auf die [group]-Plattform […] 160: der große Schritt […] war wirklich […] Durchsetzen des Entscheids, […] dass man eben eine eigene Software […] selbstständig evaluiert […,]einführt und betreibt, unabhängig von der Gruppe, das war sicherlich eine strategische Entscheidungen	Selecting an enterprise platform that is independent from the group standard	Reason quote: 113: Von dem her denke ich spielt die IT in verschiedensten Aufträgen eine wichtige Rolle. Einerseits in der Unabhängigkeit, andererseits in der schnellen flexiblen Unterstützung der Business-Requierments. 75: die IT an und für sich ist strategisch ein wichtiges Mittel für die [caompany]bank und ihre weitgehende Unabhängigkeit von der [group]. Ich denke mir, wir können uns auch durch diese Strategie eben und durch diese Unabhängigkeit der IT eben auch schnell auf veränderte Situationen einstellen, wenn die Bank sich entscheidet im strukturierten Produktebereich sich zu verstärken, dann können wir das IT-mäßig sehr schnell umsetzen. Wir brauchen nicht lange Entscheidungswege um solche Sachen nachzuvollziehen. Gutes Beispiel z.B. die Expansion im asiatischen Raum. [...] das war natürlich auch nur möglich, weil wir unabhängig [...] die Expansion der Bank, die sie ja auch durch ihre Wachstumszahlen oder -vorhaben formalisiert hat, optimal und schnell und unbürokratischer denke ich auch, als wenn wir bei der [name]Group wären, umsetzen. Also da sind wir, wir können in No-Time eigentlich irgend eine neuen Repräsentanzen aufstellen, in Monaco steht letztendlich auch vor der Tür, wir hatten das in Libanon, Beirut, wir werden das in Dubai haben nächstes Jahr, Jakarta wird dazukommen [...] dass wir auch dort diese minimal kleinen Büros optimal eigentlich so unterstützen können [...] Einfach absolut problemlos skalierbar			It is important for the management to remain independent from the group (political reason) Independence enables the IT unit to fulfill the requirements from the opportunistic flexibility and geographic growth: no need to go through group decisions (bureaucracy) Adjustments in the platform can be made more

Case #	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
						flexibly
6b	41: unsere IT-Strategie definiert und mehr eigentlich auf die Mechanismen wert gelegt 170: Ja wie wir uns aufstellen oder das wir eben diese business-driven-Strategie umsetzen können. Das wir eben auch die Mechanismen zur Verfügung stellen […], das auch das Bewusstsein eigentlich damit auch in der Geschäftsleitung noch mal bestärkt, dass sie gemeinsam entscheiden, wohin die Reise geht für die nächsten 2-3 Jahre. Also wir haben dann mit dieser business-driven-IT Strategie. ein sog. Projektportfolio-Board lanciert	Introducing a project portfolio investment committee	Reason quote: 18:Wir [IT unit] waren verschiedenen […] Kritikpunkten ausgesetzt. Besser gesagt, das war so die Intransparenz die […] außerhalb in die IT gesehen […] und andererseits war das subjektive Empfinden da, dass die IT sagt, was dann schlussendlich an Funktionalität dann umgesetzt wurde für die neuen Projekte. Dem haben wir uns einfach entgegengestellt und haben eine sogenannte business-driven IT-Strategy definiert 179: um auch diesen Vorwurf zu entgegnen, wo immer unterschwellig uns unterstellt wurde, dass wir [IT unit] quasi die Prioritäten machen. Wir haben uns einfach so bewegt, dass der, der am lautesten geschrieen hat, der hat es halt bekommen. 284: Weil es die Steuerung, die aktive Steuerung und nicht nur diese unterschwellige Steuerung, die ja … stattgefunden hat, die hat es dann auf ein ganz anderes Level gehoben, auf eine wirklich aktive mit einem Mechanismus dazu, der jedem eigentlich klar ist, jedem Geschäftsbereich klar ist, wenn er was will, wenn er was Großes will, dann muss er sich diesem Mechanismus unterwerfen, dann muss er dieses Vorhaben in dieses Projekt-Portfolio bringen und sonst gibt's einfach nichts, es gibt keine Wege dran vorbei, im Normalfall.			Countering the criticism of the business (intransparency) Giving power to business units Getting in control of IP decision-making (moving away from a political and unregulated to a regulated decision-making process)
7	117: IT so in drei Teile zerfällt. Das eine ist die Anwendungslandschaft[...] Das zweite sind Infrastruktur-Themen [...] das dritte ist IT-Management. […] was sind denn jetzt strategische Entscheidungen, dann kann man […] in jeden dieser Bereiche getrennt reingucken. […]	Decision on standardizing and centralizing IP management decisions (IP governance)	146: Managementprozesse sind für mich ne Konsequenz aus den ersten beiden. Wenn ich das Gefühl hab, ich kann sehr viel standardisieren, dann macht's auch Sinn bei den Managementprozessen mehr Eingriff zu nehmen und damit bekommen die eine höhere strategische Bedeutung. Wenn ich das Gefühl hab, ich hab lauter isolierte Gesellschaften, die ganz unterschiedliche Dinge tun, das ist so ein Sammelsurium, das ich da managen muss, dann würde ich quasi die lokalen IT Fürsten auch mehr Entscheidungsgewalt geben über	Decision depends on uniformity of IT infrastructure and IT application landscape; if they are to be standardized, then IT management processes should be standardized and centralized as well	117ff: […]wenn also die ersten zwei Funktionen, Infrastruktur, Applikation, wenn die aufzeigen, dass es viele Synergien gibt, in einem größeren Verbund, dann sind natürlich auch die Management-Prozesse auch strategischer Natur." 166: bei den Managementprozessen mehr Eingriff zu	Control and synergies from standardizing and centralizing decisions Has to fit the business situation (do we have to be different or not?)

Case #	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
			Entscheidungen, weil die müssen halt dann gucken, dass sie das Geschäft bestmöglich unterstützen			
8	229: Also ich persönlich sehe IT-Strategie immer im Zusammenhang mit Governance […] die legt fest eben, wer was tun darf, wie Budgets laufen, wie investiert wird, die ganzen Regularien	Decision on IP governance (responsibilities for budget, etc.)	249: wenn ich es halt zentral mache, habe ich mehr Durchgriff, vielleicht letztlich mehr Kosteneffizienz. Zentrale Verantwortung, ja, wenn ich es dezentral mache, habe ich vielleicht mehr Entrepreneurship, ich habe bessere Time to Market, ich habe mehr Identifikation und so weiter. Das kommt drauf an. Wir hatten historisch jetzt eine Phase oder, gut, die Bank ist da nicht raus, aber sie war extrem, wo man IT-Kosten massiv zurückgefahren hat, und da wurde logischerweise dann alles zentralisiert. Und in dem Rahmen, wo man sich öffnet und wieder wachsen will, kann man auch dezentralisieren.	Choice of governance (decentralized/ centralized) depends on business strategy	446: Governance und Strategie sind schon irgendwo Dompteure für die an sich sehr autonomen [...] und auch divergierenden Agenten. Weil jedes Business irgendwo, das ist auch im Menschen dann psychologisch verankert, ist besonders und speziell und die Anforderungen sind besonders und speziell. Und jeder will eigentlich die geniale Lösung haben und alle Anbieter am Markt und alle Consultants wollen solche Speziallösungen verkaufen. Und damit hat man so eine Entropie und dem muss natürlich die IT-Strategie und Governance entgegenwirken. 799: Corporate würde dann sagen: Na ja, aber wir brauchen nicht wieder redundante Funktionen auch in den Fachbereichen, da könnte man rationalisieren. Na ja, dann geht eben da die Diskussion. 827: polizeiliche Wirkung dann der CIO-Einheit auch.	Countermeasure, regulate business units in their urge to be specific and get their business needs done quickly and the impact of IT vendors! Regulate business units (Police) Governance has to be brought in-line with business strategy
9	1233: Was sehr detailliert da drin [IT strategy document] steht, ist die Governance-Aufgabenverteilung	Decisions on IT governance, distribution of tasks	982: das ist ja auch eine strategische Frage […] was machen wir zentral und was machen wir dezentral	Decision on what to do centally or decentrally	586: wir haben hier 250.000 Leute, wie gesagt, ich habe eine Truppe von einer handvoll Leute, […] wir sind auch drauf angewiesen, dass es so [Verantwortlichkeits-]Kaskaden gibt […] So haben wir gesagt, nee, die haben ja auch die Verantwortung und wir machen ein Rahmenwerk und die Leute müssen das in ihre Bereiche tragen. Das ist die einzige Chance in so einem Laden, der so groß ist, wenn Sie nicht wirklich mit der Pistole im Anschlag regieren wollen	Is a policy for others to act
11	126: Also bei uns im Bereich	Decision that		Reason quote:		Strategic be-

Case #	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	Konzerninformationsmanagement gibt es die Konzern-IT-Strategie. […] Da steht zum Beispiel jetzt drin, fürs nächste Jahr ist uns ganz besonders wichtig, dass alle Produkte, die wir vertreiben, transparente Kosten-Treiber-Mechanismen haben und SLAs vereinbart haben mit den Kunden.	the costs of all of the IT unit's "products" have to be transparent Decision that SLAs have to be defined for all of the IT unit's "products"		131: Das sind für uns strategisch relevante Themen, die werden ganz klar in den nächsten Jahren mit Aktionen auch hinterlegt, werden also Bedeutung haben. 701: Und wenn ich sage, mein Ziel ist eben, nicht die Kosten durch Gemeinsamkeit zu senken, sondern die Geschwindigkeit dezentral in Prozessen zu optimieren, dann hat das, glaube ich, eine andere Beantwortung der Frage, wie organisiere ich die IT, welche Governance-Strukturen habe ich, als wenn ich sage, mein Ziel ist, ein IT-Servicecenter aufzubauen und alles dort zentral abzuwickeln. Das wäre wieder einen andere Governance-Form.		cause it has a long-term impact Has to be made in line with business strategy
13	162: Aus diesen Grundsätzen gibt's dann eine IT-Gesamtstrategie, die eingebunden ist in die Strategie des Finanzvorstands. [...] das sind [...] fünf, sechs Highlights, wo wir in ganz groben Zügen wesentliche Ecklinien unserer Projektierung und Weiterentwicklung darstellen. Erst mal für die Gesamt-IT [...]	Below the vision, there is a set of corporate-level IT initiatives (corporate-level information strategy)	165: nach dem Motto: […] Wir wollen eine Shared-Service-Organisation […]	Important corporate level IT initiatives in the next 2-3 years, e.g. centralization of the IT unit (as shared service center)	165: Erst mal für die Gesamt-IT 168: Also das sind Aussagen, strategische Aussagen, die wirklich einen Blick von […] in der Größenordnung von zwei bis drei Jahren hat.	Long-term plan (2-3 yrs)

Table 29: Rights and accountability - interpretation of decisions and reasoning

k. **SOURCING DECISIONS** are related to the allocation of IP activities between the company and external parties. Only those activities that are not outsourced are potentially conducted by the internal IT unit. Hence, this decision area goes beyond decisions on the IT unit. In contrast to rights and accountability decisions, sourcing decisions concern the distribution of responsibilities among internal and external stakeholders and thus cross the boundary of the organization. The decisions counted in this decision area were the following:

- Deciding which IP activities to outsource (e.g. should we run our data center ourselves or not?) (cases 3, 4a, 8, 13)
- Selection of type of outsourcing contract to use (e.g. fixed price, frame contract, etc.) (case 4b)
- Decision on contract design (mechanisms for steering outsourcing provider) (case 10b)
- Decision on whether to change the supplier (case 10a)
- Decision on number of suppliers (single vs. multi-vendor) (cases 5, 11)
- Decision on sourcing principles (e.g. "buy before make"; "never have an in-house data center") (case 12)

The decision to outsource certain IP activities was regarded as strategic because it was expected to **decrease IP costs,** which form a large portion of overall expenditures (case 4a) and was hence hoped to increase cost competitiveness (cases 5, 11). However, this was seen as strategic with only "second priority" in case 5. In case 8, competitiveness was alluded to when the interviewee stated that competitors' outsourcing decisions have to be watched.

Much more important for arguing the choice between outsourcing and insourcing as strategic were other reasons: one was that the decision **must be made in congruence with business strategy**: if IT is a "critical success factor" for a business process – meaning that IT is important for differentiation from competitors – then these IT activities cannot be outsourced. If they were, the differentiation strategy might be jeopardized (case 5).

Another reason is that as-yet-unknown changes in strategic business requirements have to be taken into account when making the sourcing decision. Because outsourcing decisions eventually end up in contracts, these contracts must be flexible enough to avoid increases in the provider's service charges due to unanticipated changes in business requirements

(case 10); otherwise, necessary **changes in business requirements may be rendered economically impossible**. In this scenario, outsourced activities may inhibit strategic change of the company.

Sourcing decisions were also regarded as strategic because they bind the company to the direction taken for a long time and hence are **not easily reversible** (cases 4b, 13). This is because many subsequent decisions are affected by the decision to out- or insource certain activities. For example, if a certain activity is outsourced, it cannot be insourced again quickly, because the skills needed to conduct this activity would have to be rebuilt in-house first (case 4b). If the decision is made to keep an activity in-house, then this will be reflected in hiring and training staff and in the way that contracts are designed (case 13).

Maybe because of this, the decision to outsource or insource was regarded as **valid for a certain time period.** As such, the decision is thus not questioned during that time period, but remains stable and can hence be built upon in other planning decisions (case 13, but also 8 and 12).

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
3	97: Also die Fragestellung, die ganz klar hier auf dem Tisch lag war: wir haben jetzt eine Anwendungslandschaft, jetzt brauchen wir noch ne Datenbank, jetzt brauchen wir noch ne Hardwareplattform, jetzt brauchen wir ein Betriebsmodell.	Decision on sourcing	99: Also Betriebsmodell heißt, also wie betreiben wir das? Machen wir das intern? Machen wir das extern etc. pp.? Outsourcing, Insourcing	Decision made only by IT unit, no BUs involved	-	-
4a	509: in der Delivery Organisation. Da wird dann sozusagen, da ist ja die Prozesskette, dass sind die […]prozesse, die wir selber haben, unsere eigenen [of the IS unit], und dort legen wir fest: und diesen Teil der Prozesskette machen wir intern und diese Teile machen wir extern. […] Und damit ist sozusagen festgelegt, wo muss der Staff und wo gehen wir an den externen Markt	Decision about which activities of the IS unit should be conducted internally (by the IS unit) and which ones should be conducted externally (outsourced)	-	-	509ff: War jetzt auch grade Element dieser letzten strategischen Übung: zu sagen, wir trennen uns von einzelnen internen Feldern, da wir nie die Economies of scale haben […] und weil wir nie die Core Competence dort haben, weil es nicht Kern unseres Geschäftes ist, dies zu tun. Da machen wir ein Outtasking.	Gaining economies of scale analogy
4b	525: Es gibt letztlich 4 Typen von Sourcing über die wir reden in einer Strategie würde festgelegt, dann wird festgelegt zu sagen in welchen Feldern, in welcher Quantität gehen wir auf welchen Typ von Vertrag.	Decision about which type of outsourcing contract should be used for which activity	520: nachdem wir wissen, wie viel wir von außen uns holen, so und so viel geben wir wirklich über […] Outtasking [...] das machen wir über fixed price contracts und das machen wir über Framework Contracts und das machen wir schließlich über individuelle Contracts.	Decision between 4 types of contracts	562: Ja, auch da, es ist eine langfristige Entscheidung, wenn ich mal gesagt habe, ich mache Outtasking für einen bestimmten Bereich, den hol ich mir nicht im halben Jahr wieder zurück.	Long-term binding, irreversible
5	161:Klassischer Weise gehört natürlich zum Thema IT Strategie auch das Thema Providermanagement dazu, im Sinne: auf der einen Seite Single vs Multi-Vendor	Decision on use of multiple vendors or one vendor Decision on	-	-	275: wo ist IT Kernerfolgsfaktor für die Geschäftsprozesse, dann kann es sein, dass ich dort stark in eine interne Vergabe rein gehe. Wenn es eben kein kritischer Erfolgsfaktor ist, dann kann es eben auch sein, dass ich stark am	The outsourcing decision has to take into account in which activities

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	Strategie. 272: was macht ein externer Dienstleister, was machen wir selber	which activities to outsource			Marktmechanismen spielen lasse bei der Vergabe 309: diese Fragen Sourcing, IT Prozessstandards spielen für mich eher rein in eine Effizienz der IT und sind von daher auch mit dem Anteil den die IT Kosten ausmachen strategisch, da reden wir einfach über einen strategisch wichtigen Kostenblock, aber eigentlich mit zweiter Priorität	IT is a success factor. These cannot be outsourced Outsourcing leads to cost reduction and hence staying competitive
8	742: Ist es definitiv. Also ich habe es nicht explizit genannt, weil es eigentlich implizit natürlich dabei ist. Sourcing ist extrem wichtig […] Und spannend ist natürlich dann das Sourcing, In- und Outsourcing von Services	Decision on which IT activities to outsource	-	-	742:Und wir betreiben es momentan sehr zurückhaltend. Also wir schauen auch an, was andere Player tun wie die Deutsche Bank, die ihr Rechenzentrum vergeben hat an IBM, da sind die ersten Meldungen naturgemäß erst mal sehr gemischt. Da denken wir einfach, dass auch die Dienstleister da in der Erfahrungskurve noch ein bisschen hoch rutschen können mit unseren Wettbewerbern	Competitors have to be watched
10a	953: Glauben wir, dass für die nächsten drei bis fünf Jahre das der richtige Outsourcer noch ist? […] Wollen wir eine Vertragsverlängerung mit denen machen?	Decision on whether to continue with this provider or with a different one	957: Weil, ich habe ja unterschiedliche Verträge und Laufzeiten. Das heißt, die stehen immer zur Disposition	Many activities are outsourced already, so the decision is more on whether to continue and with whom rather than what to outsource	270: Das heißt, ich muss natürlich meine Verträge so bauen, dass wenn ich etwas habe, was ich heute noch nicht weiß, ... dass mir das nicht kostenmäßig auf dem Ruder läuft. 734: Ich will nichts Spezielles haben, sonst komme ich von Dir nicht weg 957: [wenn ich] den Zahlungsverkehr wechseln würde, dann muss ich mindestens zwei Jahre vorher mit einem neuen verhandelt haben und ich brauche mindestens ein Jahr zum Umzug. Weil ich kann es ja kaum ... Die Daten, die Struktur muss ... Also Zahlungsverkehr, das Wertpapiersystem umzuswitchen, das ist ein Akt, also das muss ich hinterfragen, ob das noch die richtigen sind.	Contracts have to be designed such that they ensure that dependency on providers or unanticipated changes do not increase costs in a way that makes change economically impossible Not easily reversible
10b	270: Das heißt, ich muss natürlich meine Verträge so bauen, dass wenn ich etwas habe, was ich heute noch nicht weiß, ... dass mir das nicht kostenmäßig auf dem Ruder läuft.	Decision on contract design				
11	349: Ein Element, was ich jetzt noch nicht erwähnt habe, ist das	Decision on number of			75: Und die haben auch konsequenterweise vor zwei, drei Jahren praktisch die gesamte IT	Cost decrease

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
	Thema Sourcing-Strategie. 450: Also da steht zum Beispiel drin: Wir fahren eine 27-Provider-Strategie	suppliers			outgesourct und einen Fixpreis quasi gemacht. Und das sind Früchte, die die geerntet haben, die sie ein paar Jahre vorher letztlich auch festgelegt hatten.	
12	None	Decisions on general IT principles	None	Principles of sourcing (buy before make; no in-house data center)	None	Is a principal guideline
13	303: Bei Sourcing ist die Frage: make or buy? Ganz klassisch. Was machen wir selbst, was machen wir nicht selbst?	Which IT processes should be conducted internally, which ones should be outsourced	319: Es gibt uns keiner eine Outsourcing-Strategie, außer vielleicht der Finanzvorstand vor, sondern der Unternehmensbereich dem liefern wir seine Applikationen und ob wir im Hintergrund achtzig Prozent extern sourcen oder intern, das muss ihm eigentlich egal sein oder ist ihm auch egal.	Not relevant for business units and their requirements. Purely focused on how the services are delivered	362: Zum Beispiel […], wir haben entschieden […] den Betrieb der Rechenzentren weiterhin selbst zu machen […] der Eigenbetrieb ist jetzt mal für drei Jahre gesetzt und damit haben wir hier eine feste Größe, an der wir uns auch planerisch orientieren können. 386: Also eine Frage, mache ich Eigenbetrieb oder source ich aus, kann ich ja nicht … […] dass eine gewisse Verlässlichkeit auf so eine Entscheidung ist […] brauche aber eine gewisse strategische Fixierung, um halt dann im Sinne des Taktisch-Operativen mich an klaren Rahmenbedingungen zu orientieren 407: […] Wir haben entschieden, wir machen das Netzwerkmanagement für die nächsten drei Jahre mal selbst. Das heißt, wir haben damit einen […] ergänzenden Mann aufgebaut, wir haben eine Weiterbildung gemacht und wir haben mit unseren Providern unter diesen Gesichtspunkten verhandelt. [...] Wenn ich dann in jeder einzelnen Entscheidung die Frage wiederum thematisiere […] Also wenn ich […] dann sagen würde „Wir lagen das […] aus", dann habe ich einen Mann zu viel.	Provides guideline for subsequent decisions: can be relied on for planning purposes Not easily reversible, because other decisions are affected by the sourcing decision

Table 30: Sourcing - interpretation of decisions and reasoning

l. **SECURITY AND CONTINUITY PLANS AND POLICIES** are concerned with avoiding or alleviating technical threats to business continuity or security. In comparison to architectural standards, their aim is more specific than ensuring a technically sound architecture. They address "[…] issues such as disaster recovery work. If something massive happens, how quickly are we able to support the business again?" (case 7). The decisions in detail were:

- Decision on introducing disaster recovery mechanisms (cases 4, 7)
- Decision on security policies and mechanisms (cases 10, 11)
- Decision on security vs. cost trade-off principle (cases 12, 13)

The reasons for viewing these decisions as strategic are the criticality of IP for business (i.e. a highly negative impact if security and continuity are not ensured), the fact that the topic typically gets neglected in day-to-day work, is a company-wide topic, and involves a trade-off between security and cost.

If the IT systems are not working, there will be a negative impact on business (e.g. inability to carry out business processes (case 4), loss of revenue (case 7), reputation (case 11), etc.). For companies that are pure online players, the company ceases to exist for the customer if certain IT systems are not available (case 10). In summary, security and continuity topics are said to be **critical to business operations**.

The topic was argued to be featured prominently on the information strategy agenda because **external threats have increased a lot**, and therefore require urgent attention (case 12).

Another reason provided for why security should be on the strategy agenda is that it **gets buried in day-to-day operations** too easily. Security is perceived as costly and does not show immediate benefit (case 7). Thus, putting security on the strategy agenda is seen as **forcing people to care about it**. Furthermore, it has to be handled centrally, because no single business unit or region has an interest in implementing security measures; just as the state has to take on tasks that individual citizens would not willingly perform. Hence, security has **company-wide** importance across all parts of the business (cases 7, 11).

In case 11, ensuring security was considered important for the ability to integrate and disintegrate companies. As merging and divesting parts of the company was seen as a strategic business requirement, security was seen as **a necessary prerequisite for executing this business strategy**.

Finally, the principle that security is important – but at a reasonable cost – was seen as a **guideline for further decisions** and one that would set expectations (case 13).

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
4	330: Ein sehr typisches Beispiel [...] wir bauen unsere Systeme normalerweise nach dem „2 and a half node concept". [...] müssen hier hoch sicher sein, wir müssen hoch verfügbar sein. Wir müssen im Falle eines Desasters weiter arbeiten. Also werden die Applikationen normalerweise als Clusterlösungen gebaut, die an 2 unterschiedlichen Standorten laufen.	Decision to make systems redundant in different locations	-	-	330: müssen hier hoch sicher sein, wir müssen hoch verfügbar sein. Wir müssen im Falle eines Desasters weiter arbeiten. […] dass die Services der [company] weiter verfügbar sind.	Availability is important because public services depend on it.
7	131: Rechenzentrumsbetrieb würde ich auch als strategisch ziemlich wichtig ansehen 133: am Ende des Tages ist mir wichtig, dass solche Sachen wie Desaster-Recovery funktionieren. Also wenn irgendetwas Massives passiert, wie schnell sind wir in der Lage wieder das Geschäft zu unterstützen, dass wir keine Zeit verlieren.	Decision about introducing desaster recovery	267: Also wir hatten jetzt in den USA z.B. in den letzten 12 Monaten ein paar Geschichten, Eisstürme die irgendwie die ganzen Standorte lahm gelegt haben, für – nicht wie es bei uns immer so üblich ist – so 2-3 Stunden, sondern für 48 Std., was dann ne katastrophale Auswirkung auf den Rest des Geschäftes hat. 289: kam sozusagen auf die Agenda, weil es ein konkretes Problem gab	Can cause significant problems	3: "also wenn irgendetwas Massives passiert, wie schnell sind wir in der Lage wieder das Geschäft zu unterstützen, dass wir keine Zeit verlieren." 263: das liegt einfach daran[…] dass das etwas ist, was im Tagesgeschäft schnell mal nicht die Bedeutung haben kann, die es haben muss, also vielleicht kann man […] IT-Strategie auch ausdehnen, auf Sachen, […] [bei denen] man die Landesgesellschaften auch stärker unterstützen [muss] 269: was dann ne katastrophale Auswirkung auf den Rest des Geschäftes hat. 275: je kleiner ne Landesgesellschaft ist, desto mehr muss man da […] Einfluss nehmen, weil die nämlich mit höherer Wahrscheinlichkeit hinten runter fallen. 282: es bringt ja erstmal nichts, das kostet ja nur Geld und Mühe und nur im Fall wenn was passiert, hat man was davon. Und da auch Akzeptanz dafür zu erzielen, dass man	Critical impact on business continuity Gets neglected/buried in day-to-day operations, does not get the focus it deserves and needs because it only avoids negative impact, does not have direct positive impact Needs to be put on strat-

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
					da was braucht, dass ist was, was vielleicht auch noch ein Kritierium sein kann für strategische Entscheidungen, wo quasi so eine Landesgesellschaft auch Unterstützung braucht, sich durchzusetzen, dass das ne sinnvolle Sache ist.	egy agenda so that it cannot be ignored
10	975: Penetrationstest wird immer mitgeführt [in der IT-Strategie] […]BSI-Standard 1057: Datenschutz. Auch ein … Thema 1049: IT-Sicherheit ist natürlich ein extra Punkt, ganz klar 1056: Also das Ausfallrisiko wird bei uns ganz klar betrachtet	Decision on security standards, data privacy, measures against external attacks, measures against downtime			591: wenn wir irgendwo ein Sicherheitsleck hätten, dann können wir das Unternehmen dicht machen	Ciritical for business existence
11	719: Also was bei uns auch Thema der Konzern-IT-Strategie ist, ist, weil es auch ein gemeinsames Thema ist, ist Sicherheit, IT-Sicherheit	Decisions on IT security	747: Sicherheit ist so für uns der Oberbegriff rund um das Thema Rollen […]. Also wir haben in der Airline-Branche zum Teil relativ offene Systeme und dadurch, dass auch Fremdfirmen, Fremdpersonal direkt auf unsere Buchungsmaschinen zugreift, auf unsere Reservierungs- und Check-In-Systeme, ist das einfach ein großes Thema. An dem zeigt sich letztlich, wie gut kann ich andere Firmen integrieren oder eben auch wieder raus nehmen und welche Sicherheitslücken bleiben drin. Also es gibt immer wieder Fälle von Missbrauch, sage ich mal.	Security is about access to systems Is strategic because it determines the ability to integrate or disintegrate other companies in mergers and disinvestments	721: Das hat eine strategische Bedeutung, weil es zum einen dort Handlungsbedarf gibt, der alle betrifft, und zum anderen auch was zu tun hat mit der Frage, wie effektiv kann der [company]-Konzern Firmenübernahmen durchführen oder auch Firmen wieder desintegrieren. 728: das ist natürlich auch eine der strategischen Geschäftsanforderungen des [company]-Konzerns, zu sagen, das möchte ich beides können, und da muss dann natürlich auch der IT-Sicherheitsecke heraus eine Antwort drauf gefunden werden. Deswegen ist das bei uns auch ein strategisches Thema.	Corporate-wide topic It influences how well the company can integrate and disintegrate other companies, which is business strategy
12	None	Decisions on general IT	None	Principles on	None	Threats andimpost

Case	Decision quote	Decision summary	Context/detail quote	C'txt/detail summary	Reason quote	Reason summary
		principles		security		have increased
13	124: Also erstens haben wir eine Vision, sage ich mal, die besteht aus vier Kernsätzen, was die IT bei [company] ausmachen soll.	Vision is part of the broader concept of information strategy. It defines the role of IT in terms of guiding principles	149: wir wollen Standardsoftware einsetzen, wir definieren uns aus einer optimalen Unterstützung der Geschäftsprozesse, wir betrachten Security, allerdings in einem vernünftigen Kosten-Leistungs-Verhältnis, wir unterstellen uns einem konsequenten Benchmarking und wollen wettbewerbsfähige Leistungen zu ... Ich sage mal, wir wollen keine Pioniere sein in der IT.	It is a guiding principle that security is important but follows cost/benefit considerations	124: Kernsätzen, was die IT bei [company] ausmachen soll	Provides a guideline for subsequent decision.

Table 31: Security and continuity - interpretation of decisions and reasoning

Decision areas	Reasoning																	
	1 Supports execu-tion	2 Might hamper differentiation strategy or mergers	3 Strategy influ-ences decision	4 Avoid violation of strategy	5 Is needed for going public	6 Extend business scope	7 Support satisfy-ing business re-quirements	8 Incentivize BUs to act in favor of corporation	9 Incentivize/ regulate BUs	10 Cost reduction through scale ef-fects	11 Cost reduction through synergies	12 Not hamper implementing future bus. re-quirement change	13 Avoid obsoles-cence despite envi-ronm. change	14 Has to support unknown future requirements	15 Need to react quickly to business requests	16 Do not hamper frequent reorgani-zations	17 Counter BUs tendency to intro-duce complexity	18 Reduce IT-organizational complexity
a Application landscaping	3, 12, (13)						3						2	3				
b Application standards		5			9						5, 7							
c Architectural standards	12	5a	8, 12	10					3, 11a		5a, 5b 8, 9, 13	1,10			6a	5a	4b, 6a, 8	
d Process standards											11				12		6	2, 9c
e Portfolio/investment			11, 13				11											
f Budget																		
g Projects for market activit.	6, 13																	
h HR plan/org of IT unit																	4a	
i Role of IT unit						3b												
j Rights/accountability			7, 8				2	3, 5c	2, 6b, 8		5b, 7				6a		8	
k Sourcing		5								4a, 5, 11		10						
l IT security and continuity		11																

Table 32: Decision areas and reasoning (1/2)

Decision areas	Reasoning																
	19 Is a resource allocation/prioritization	20 Is a long-term plan: what to do next x years	21 Corporate-wide impact	22 Not easily reversible economically or technically	23 Is a fundamental choice that excludes other alternatives	24 Changes how IT operates fundamentally	25 Is a guideline/plank/policy for subsequent decisions	26 Huge financial impact	27 Decided under uncertainty	28 Gets buried in day-to-day operations	29 Is new for company	30 Needs to be resolved by top mgmt	31 Core competencies belong to strategy	32 Elements found in a strategy transferred to IT unit	33 Political independence	34 Critical for business continuity	35 Important for gaining acceptance from business units
a Application landscaping		2, 13	13														
b Application standards			7														
c Architectural standards		11b	3, 7, 11a	1, 4a, 4b, 6a, 10, 13	1, 6b, 8, 10		3, 4a, 6a, 7, 11a, 13	4a									
d Process standards			9b	4b		6, 12	4a										
e Portfolio/investment	4, 8, 11, 13	4, 13					8					11			11		
f Budget	5	4							3								
g Projects for market activities																	
h HR plan/ organization of IT unit	4c			4e				6			4d		13				
i Role of IT unit						3b	13							4a, 4b, 4c			3a
j Rights/ accountability		11, 13		4			4				4				6a		6b
k Sourcing				4b, 10, 13			12, 13						4a				
l IT security and continuity			11							7						4, 7, 10, 12	

Table 33: Decision areas and reasoning (2/2)

3.2 CLASSIFICATION OF CONTENT BY REASONING

Table 34 displays the decision areas by case and hence provides an overview of the previous section across cases. A number (e.g. "1") in the cell in row x and column y indicates the number of decisions that were mentioned in case y that we grouped into decision area x. The last column (headed by the Greek sigma) contains the sum of the decisions across all cases within this decision area. The second to last column contains the number of cases that included the respective decision area in their information strategy.

Content of information strategy (decision areas)	**Cases (numbers indicate the number of decision instances)**												**#Cases**	**Σ**
	1	2	3	4	5	6	7	8	9	10	11	12	13	#	89
a. Application landscaping		1	1									1	1	4	4
b. Application standards					1		1		1					3	3
c. Architectural standards	1		1	2	2	2	1	1	1	2	2	1	1	12	17
d. IT process standards		1		2		1			3		1	1		6	9
e. Portfolio/investment				1				1			1		1	4	4
f. Budget			1	1	1					1				4	4
g. Projects for market act.						1							1	2	2
h. HR plan/org of IT unit				5		1						1	1	4	8
i. Role of IT unit		1	2	4									1	4	8
j. Rights & accountability		1	2	1	3	2	1	1	1		1		1	10	14
k. Sourcing			1	2	1			1		2	1	1	1	8	10
l. Security/continuity				1			1			1	1	1	1	6	6

Table 34: Information strategy content by case

Table 32 and Table 33 summarize the reasons provided by the interviewees within each decision area for arguing the respective decisions as strategic. A number (e.g. "5") in the cell with the coordinates row x and column y means that a decision in the decision area x was part of the information strategy in case 5; the decision was reasoned to be strategic with reasoning y. The exact decision can be traced by going back to the respective decision area in the previous section.

Several observations can be made from looking at these tables: first, analyzing Table 34 or Table 32 and Table 33 row-wise reveals that no one decision area was present in all cases. Our sample size, as well as the qualitative approach, does not allow for generalizable statistical analysis. Still, some decision areas feature more often in the information strategies of our sample than others. Architectural standards are on the information strategy agenda in almost all cases. Similarly, rights and accountability decisions are frequently viewed as part of information strategies. Similarly, sourcing decisions frequently form part of the content of information strategies. In contrast, interviewees hardly mentioned decisions concerned with launching (strategic) IS/IT projects to support market activities in their information strategy.

Also, decisions on application landscaping standards, portfolio/investment, budget, HR and organization, and the role of the IT unit were less often part of information strategies.

Second, analyzing Table 34 column-wise, we do not see any immediately visible patterns or combinations of decision areas: no two cases exhibit exactly the same combination of decision areas. The impression we get is that the combination of decision areas in information strategies is somewhat idiosyncratic. At least, there is no dominant design of information strategy content. However, reasons and decision areas reoccur across cases.

Third, each decision area was argued to be strategic for multiple reasons. Interviewees used several reasons to argue the same area as strategic (e.g. decision area a, case 3: reasoning 1, 7 and 14; decision area k, case 10: reasoning 12 and 22; or decision area e, case 11: reasoning 3, 7, 19, 30 and 33). Also, most interviewees provided different reasons across different decision areas.

Going beyond description, we will discuss the reasoning used by practitioners to argue the decisions as strategic in the next section.

To this end, we now analyze the different reasons summarized in Table 32 and Table 33 in the previous chapter. To obtain better insight into the practitioners' reasoning, we grouped the reasons into categories in order to avoid repeated discussion of each reason for different decisions.

A useful classification of reasoning is found in argumentation theory (Toulmin et al. 1984). This theory tries to be helpful in answering "what does it mean to ask if someone's statement […] is sensible or well reasoned […]?" (Toulmin et al. 1984, p. 4). In this view, statements "succeed or fail only to the extent that they can be 'supported' by arguments, reasons, evidence, or the like and that are able to carry the reader or the hearer along with them only because they have such a 'rational foundation'" (p. 5). When we look for practitioners "reasoning", we look for "reasons in support of a claim" (p. 6), namely the claim that certain IP decisions are strategic. Toulmin et al. (1984, pp. 216) distinguish four kinds of reasoning: reasoning from analogy, reasoning from sign, reasoning from cause and reasoning from generalization.[31]

The following sections classify the reasons provided by practitioners according to these categories.

[31] Reasoning from generalization was not employed in our sample. This is not surprising, as generalizing from a certain representative sample is more likely to be found in academia than in practice.

3.2.1 IP decisions reasoned as strategic from sign: Characteristics of strategic IP decisions

A number of IP decisions were argued to be strategic because they exhibit certain characteristics. These characteristics are understood to signal strategic decisions. The underlying assumption is that these characteristics are common to all strategic decisions and as such help to identify decisions that are strategic in nature. Interviewees used the following characteristics to portray strategic decisions (see decisions 19-30 marked with "Characteristics" in Table 33):

- Irreversibility (reason 22 in Table 33): once made, certain decisions (decision areas c, d, h, j, k) were argued to be difficult to reverse in a technical or economic sense; the organization is tied to the respective decision for a long time. Interviewees mentioned a binding duration of at least 2-5 years (cases 2, 4, 10, 13). Changing the decision would incur high costs, rendering a change economically unfeasible. Interviewees emphasized this infeasibility for decisions that influence a number of subsequent decisions and entail large resource commitments:

  > "wie eben diese Ausrichtung auf diese ORACLE-Datenbanken damit verbunden, also man richtet sich ja nicht nur auf ORACLE ein, sondern man braucht die Leute dazu, man braucht die Mechanismen dazu und das Know-how. Man muss ja da auch, ich meine nur die ORACLE Datenbank zu betreiben, das ist das Eine, aber dass diese ganzen Mechanismen von einem Business-Contingency-Management darin dann auch zu verpacken, dass ist das Andere und ich denke so eine Entscheidung ist schon sehr strategisch und die kann man von heute auf morgen, also kann man schon, aber sollte man eigentlich nicht von heute auf morgen ändern." (decision area c, case 6a)[32]

- Guideline purpose (reason 25): some decisions serve the purpose of guiding or directing subsequent decisions (decision areas c, d, e, i, j, k, l). For example, the selection of technology or process standards has implications for the skills required of IT unit staff in order to employ the chosen technology or processes.
- Company-wide effects (reason 21): certain decisions (areas a, b, c, d, l) were also argued to have a company-wide effect, i.e. they affect all business units or functions.

[32] Translation by author: "Just like this focus on the ORACLE-databases is connected (with it), you know, you don't just choose ORACLE, but you need the people for it, you need the mechanisms for it and the know-how. You have to, I mean, just operating the ORACLE-database, that's one thing, but also put all these mechanisms together to a business-contigency-management into it, that's another story and I think such a decision is very strategic. And this decision you could, well, you could, but you should not change them all of the sudden, from one day to another.

- Fundamentality (reasons 23 and 24): the choice of technology standards (area c) was stated to entail the elimination of various alternatives, i.e. that one alternative had to be chosen to the exclusion of others. Other decisions were said to fundamentally change the way IT operates (areas d, i).
- Prioritization of resource allocations (reason 19): decision areas e (portfolio), f (budget), and h (HR plan/organization) were argued to be trade-offs in the form of prioritizations of resource allocations.
- Magnitude of (financial) impact (reason 26): some decisions were argued to have a dramatic (financial) impact on the organization (areas c, h).
- High level of uncertainty (reason 27): a number of decisions were regarded as being made under a high level of uncertainty (e.g. setting the budget (f)) or leading to uncertain dependencies (e.g. sourcing (k), architectural standards (c)).
- Long-term perspective (reason 20): decisions (areas a, c, e, f, j) were regarded as long-term plans laying out what the organization would do in the future (again, over the next 2-3 years). These decisions are considered part of a master plan that prescribes future activities.
- Burial in day-to-day operations (reason 28): the planning of measures to ensure IT continuity was argued to be a strategic decision because they otherwise tend to get buried in day-to-day operations (case 7). Because the benefit of planning only becomes obvious in hindsight, namely in the case of outages, this decision is usually ignored and de-prioritized compared to (day-to-day) decisions with a more obvious impact.
- Novelty (reason 29): decisions in areas h (HR and organization) and j (rights and accountability) were argued to be completely new for the organization and hence regarded as strategic.
- Decision-maker (reason 30): one decision area (e, portfolio) was argued to be strategic by virtue of having to be made by top management, i.e. only executives can resolve the prioritization conflicts among the various stakeholders. In other cases (e.g. in case 3), other decisions (e.g. on architectural standards) were argued to be strategic, but did not have to be made by top managemers because were not regarded to have the competence to make the decisions.

For reasoning from sign, (Toulmin et al. 1984) states that the "central question is, simply, just how certainly any sign is associated with what it is supposed to signal" (p. 223). In other words, the question is how accurately the signals really indicate that the respective decisions

are strategic. In fact, 'What differentiates strategic decisions from non-strategic ones?'[33] or 'What are the characteristics of strategic decisions?' were key quiestions in the formation of early strategy (e.g. Ansoff 1965) and still are today (Grant 2005). However, there is no definite set of characteristics that sharply distinguishes strategic from non-strategic decisions. Rather, we find a number of different proposals. The most commonly found characteristics are listed below (see Table 35):

- Long-term perspective: most authors agree that strategic decisions have a long-term perspective while the perspective of non-strategic decisions is of a shorter term. There are various interpretations of the meaning of long-term perspective. One interpretation is that strategic decisions have a *long planning horizon*, i.e. they concern what an organization will do in the next 5-10 years. The practitioners we interviewed cited that reason, as well. However, they defined a shorter time period, 2-5 years at the most. Another interpretation of "long-term perspective" is that strategic decisions *take a considerable amount of time before they are fully implemented* because they have a transformative character that entails significant changes (Johnson et al. 2005, pp. 6) (see comment on significant impact below). A third interpretation focuses on the duration of the effect. Here, strategic decisions are said to have *long lasting, enduring effects that cannot be easily reversed* (Ackoff 1970; Angell 1990). Ghemawat ((Ghemawat 1997) pp. 22; citing Robert Townsend) briefly describes the practical logic of irreversibility as an inherent strategic characteristic: if a decision does not lock the decision maker into a certain direction, but can instead be reversed easily later on, there would be no reason to think about this decision for more than "three seconds." As an example, the decision to compete as a low-cost producer rather than to differentiate cannot be reverted quickly, because it involves e.g. changing a whole brand image that has been built up by many operational marketing decisions, customer perceptions, etc. As indicated above, practitioners relied to a large extent on this characteristic to argue decisions as strategic.
- Directional nature: strategic decisions provide a *direction or guideline for other decisions*. They serve as a framework in which other decisions are made, a point of orientation. Thus, they *affect non-strategic decisions* and "trigger whole series of other decisions" (Johnson et al. 2005). Once a direction is chosen, it cannot be changed without changing

[33] Different authors assign different names to non-strategic decisions. Johnson et al. (2005) distinguish between strategic and operational decisions, Ackoff (1970) between strategic and tactical decisions and Ansoff (1965) between strategic, administrative and operational decisions.

all the decisions that have already been affected by the strategic decision. Again, a number of decision areas were argued to posess this characteristic.

- Broad impact: strategic decisions have a broad impact in several ways: first, their *impact is organization-wide* and cross-functional. Decisions that only impact individual functions are less strategic (Johnson et al. 2005). Secondly, they imply a *significant change* (Johnson et al. 2005) that has *major resource implications* (in terms of financial resources, human resources, etc.) and are thus expected to *influence the success of the organization substantially* (Steinmann and Schreyögg 2002) – in terms of resource investments and generated effects. For example, the decision to extend the scope of a company by either acquiring an existing company or building up a new workforce, machinery, etc. requires significant resource investments. Practitioners alluded to the (financial) magnitude of the decisions' impact, to its company-wide effect as well as trade-offs regarding the allocation of resources (see above).

- Concerning internal and external fit: an organization's strategic decisions take into account both, the external environment and internal factors. Strategic decisions are about *fitting these internal factors to external characteristics*. Ansoff (1965) states that they are "concerned with establishing an 'impedance match' between the firm and its environment". One specific variant of this characteristic asserts that strategic decisions *focus on competition* (Steinmann and Schreyögg 2002). Practitioners did not use this characteristic directly; it may be seen as implicitly included in their discussions about external cost pressure or trying to "fit" IP decisions to a given business strategy. However, in general, practitioners were more inward-oriented when arguing decisions as strategic rather than seeking a fit between internal and external factors.

- Difficult to make: because of the aforementioned characteristics, it should come as no surprise that strategic decisions are difficult to make. For example, a decision that cannot be reversed easily and that affects the whole organization and its success has to be considered carefully and requires considerable thought. But even beyond the characteristics mentioned above, strategic decisions may be characterized as *complex*: this is because they involve making a selection from a range of alternatives ("choices" according to (Rumelt et al. 1994)). This holds true even more if one follows Ansoff (1965) who stated that strategic decisions are *infrequently made, novel and non-routine*. If a decision is made on a routine basis (such as booking accounts receivable), then it is not strategic. Adding to the difficulty of making strategic decisions is their future orientation: strategic decisions

are made *about the uncertain future* with a set of assumptions about future trends and developments (Johnson et al. 2005). Thus, their outcome cannot be easily predicted. By mentioning the uncertainty, fundamentality, and trade-offs of resource prioritizations, the practitioners also alluded to these characteristics found in the literature. It has to be questioned, though, whether a decision that is new to the organization can always be considered strategic.

Comparing the reasoning given by interviewees with that found in the literature, we see that they are very similar (apart from practitioners not relying on the "internal/external fit" criterion very much, however). Hence, arguing decisions as strategic from sign is generally backed by literature. Taking into account that each decision (apart from launching IS/IT projects supporting market activities) was argued to exhibit at least one of the characteristics, can we reason that all of these decisions should be part of an information strategy? Two aspects make it difficult to build a construct based solely on this type of reasoning.

First, it is unclear whether a strategic decision has to exhibit all of the characteristics or only some. Hickson et al. (1990, p. 28) only state that "a strategic decision is likely to shape what happens because it has some or all of certain features [see above] to a greater extent than do other decisions." Second, what most authors agree on is that these characteristics are relative to the person making the judgment, i.e. subjective. For example, Hickson et al. (1990, pp. 27) answer the question "What makes strategic decisions strategic?" by stating that "A strategic decision is one in which those who are involved believe will play a bigger rather than a smaller part in shaping what happens for a long while afterwards. This is a relative judgment, relative to the organization in which the decision is being made […]" They go on stating that "it is not impossible for what is a big matter in one [organization] to be less weighty in another […]" (pp. 27). Similarly, Ackoff (1970, p. 5) notes that the "distinction between tactical and strategic planning is often made, but is seldom made clear. Decisions that appear to be strategic to one person may appear to be tactical to another. This suggests that the distinction is relative rather than absolute."

The subjective nature of the characteristics as well as the fact that it is unclear which of these have to be fulfilled in order for a decision to be deemed strategic indicates that a personal assessment of the criteria (whether by an interviewee or any researcher) cannot be regarded as the only and ultimate benchmark for strategic decisions. For arguing the content of an information strategy, the decisions' characteristics are only indicators. Hence, the characteristics provided by the interviewees can only serve as necessary – but certainly not as sufficient –

conditions for the respective decisions to qualify as strategic. However, the exhibition of certain characteristics reinforces the strategic nature of the decisions mentioned by practitioners.

Source	Quote	Characteristics												
		Long planning horizon	Take long time	Long term effect, irreversible	Direction setting	Company wide impact	Significant impact	major resource implications	Influence success	Concern fit of int/ext; competitive	Complex	Infrequent, novel, non-routine	uncertainty, future oriented	Influenced by powerful stakeholders
Ackoff (1970, pp. 5)	1 "The longer the effect of a plan and the more difficult it is to reverse, the more strategic it is […] decisions that have enduring effects that are difficult to reverse" (p. 5) 2 "The more functions of an organization's activities are affected […], the more strategic [...]broad in scope" (p. 6)			1		2								
Johnson, Scholes, Whittington (2005), pp. 6	1 "concerned with the long- term direction of an organisation […] transformation […] would take a considerable amount of time" (p. 6) 2 "can be seen as the search for strategic fit" 3 "require major resource changes for an organisation in the future" 4 "are likely to be complex in nature" 5 "have to be made in situations of uncertainty about the future" 6 "are likely to affect operational decisions [...] trigger off a whole series of new operational activities" 7 "cross functional and operational boundaries" 8 "involve significant change" 9 "affected [...] by the values and expectations of those who have power [...] - the stakeholders"		1		1,6	7	8	3		2	4		5	9

Source	Quote	Characteristics												
		Long planning horizon	Take long time	Long term effect, irreversible	Direction setting	Company wide impact	Significant impact	major resource implications	Influence success	Concern fit of int/ext; competitive	Complex	Infrequent, novel, non-routine	uncertainty, future oriented	Influenced by powerful stakeholders
Steinmann & Schreyögg(2002, p. 154)	1 “sind konkurrenzbezogen, d.h. sie bestimmen das Handlungsprogramm der Unternehmung in Relation zu den Konkurrenten” 2 “nehmen Bezug auf die Umweltsituation und -entwicklungen, auf Chancen und Bedrohungen” 3 “spiegeln die zentralen Einstellungen, Wünsche und Wertvorstellungen der bestimmenden Entscheidungsträger wider” 4 “sind auf das ganze Geschäft gerichtet [...] und nicht nur [auf] einzelne[r] Funktionsbereiche” 5 “haben eine hohe Bedeutung für die Vermögens- und Ertragslage [...] und weitereichende Konsequenzen, was die Ressourcenbindung anelangt; [...] ‘große’ Entscheidungen” 6 “sind zukunftsorientiert [...] basieren auf Erwartungen über die Entwicklung”[34]					4	5	5	5	1,2			6	3

[34] Translation by author: 1 “are related to competition, i.e. they determine the action program of the company in relation to the competitors” 2 “relate to the environmental situation and developments, to opportunities and threats” 3 “reflect the main attitudes, wishes and values of the decision-maker in charge” 4 “focus on the entire business [...] and not only [on] single functional units” 5 “have a high impact on the asset and profit situation [...] and far reaching consequences concerning the resource commitment [...] ‘big’ decisions” 6 “are oriented towards the future [...] are based on expectations concerning the development”

Source	Quote	Characteristics												
		Long planning horizon	Take long time	Long term effect, irreversible	Direction setting	Company wide impact	Significant impact	major resource implications	Influence success	Concern fit of int/ext; competitive	Complex	Infrequent, novel, non-routine	uncertainty, future oriented	Influenced by powerful stakeholders
Ansoff (1965, pp. 3, pp.9)	1 "are primarily concerned with external, rather than internal, problems of the firm […] concerned with establishing an 'impedance match' between the firm and its environment" 2 "Decisions nonrepetitive" 3 "Decisions not self-regenerative […] they make no automatic claims on top-management attention. Unless actively pursued, they may remain hidden behind operational decisions"									1		2,3		
Hickson et al (1990, pp. 27) Also cited in (Wheelen and Hunger 2006, p. 20)	1 "is one in which those who are involved believe will play a bigger than a smaller part in shaping what happens for a long while afterwards" 2 "it is about something that does not come up very often. It is more rare and non-routine than most […] and therefore comparatively novel [...] There will be few if any direct precedents for it, yet it is likely to set precedents for subsequent decisions" 3 "it commits substantial resources" 4 "it sets off 'waves' of lesser decisions [...] and so is comparatively organization-wide in its consequences" "In short, it is relatively unusual, substantial, and all-pervading"	1		1	1, 4	4	1	3				2		
Grant (2005, pp. 14)	"Strategic decisions […] share three common characteristics: [1] They are important [2] They involve a significant commitment of resources [3] They are not easily reversible"			3			1	2						

Table 35: Characteristics of strategic decisions stressed in literature

3.2.2 IP decisions reasoned as strategic from analogy: Building analogies to business strategy

In a few instances, IP decisions were argued to be strategic because they "look like" or are analogous to business strategy decisions (reasons 31 and 32 in Table 33). In other words, the content structure of information strategy was modeled according to the content structure of the business strategy. For example, elements assumed to be part of the business strategy construct, such as mission, vision, scope (i.e. products and markets), core competences, etc., were transferred to the information strategy construct.

It was argued in case 4 that business strategy concerns the mission and vision of a company and also includes decisions on its market, products, and distribution channels. These terms were transferred to IP, resulting in an information strategy construct that consists of decisions on the mission and vision of the IT unit (decision area (i - Role)), its "products," and "customers" (i.e. IT services provided to business units, decision area (e - Portfolio) and (i - Role), respectively) and committees that decide which "customers" (business units) receive which "products" (IT services) (decision area (j - Rights)).

Similarly, the interviewee in case 13 stated that determining the "core competences" of the IT unit staff is a strategic IP decision (decision area (h - HR plan)). Examples of these "core competences" were "speaking English fluently" and having "business acumen."

Such an application of business strategy terms to determine information strategy content is a form of reasoning by analogy. Arguing by analogy assumes "that there are enough similarities between two things to support the claim that what is true of one is also true of the other" (Toulmin et al. 1984) (p. 216). Here, the claim is that because business strategies include certain decisions on companies', information strategies should contain these types of decisions, as well.

We have come across this kind of reasoning with regards to the information strategy construct in literature in the model proposed by Henderson and Venkatraman (1993) (see Chapter 2). However, these authors derived different information strategy decisions through analogy: "technology scope", "systemic competences" and "governance". This disparity is already an indication for the need to handle reasoning from analogy with care. It is difficult to argue against one or the other analogy as most analogies have certain shortcomings.

Indeed, analogical reasoning is considered controversial in strategic management literature. On the one hand, analogy is claimed to be "a form of managerial reasoning that we believe is prevalent among practicing strategists yet is largely absent from scholarly analysis of strat-

egy" (Gavetti et al. 2005 p. 692). The power of analogy lies in allowing people confronting a novel situation to use their past experience or insights from similar situations and transfer them to the novel situation. In our context, the novel situation is 'constructing an information strategy' and the past experience consists of 'constructing a business strategy'. The sources of experiences in building a business strategy might be diverse. They could range from practical experience to mere textbook or common-sense knowledge. From our discussion with interviewees who used reasoning from analogy, we can assume the latter rather than the former to hold in these cases.

On the other hand, this reasoning has to be viewed with a critical eye, especially because "though analogical reasoning is a powerful and prevalent tool, it is extremely easy to reason poorly through analogies […] Dangers arise when strategists draw an analogy on the basis of superficial similarity, not deep causal traits" (Gavetti and Rivkin 2005, pp. 3).

We break our discussion of this kind of reasoning into three parts (Toulmin et al. 1984): 1. Is the basis of the analogy justified (i.e. is the assumption of similarity between the two objects valid)? 2. Has the statement made about the original object (business strategy) been transferred correctly to the other object (information strategy)? 3. If the answer to the first two questions is "yes", what are the potential consequences of using this reasoning for information strategy?

Ad 1: Challenging the similarity of companies and IT units: reasoning by analogy is only valid if the objects involved in the analogy are similar: "clearly, the power of analogy depends on the validity of the similarity mapping between source and target contexts" (Gavetti et al. 2005 p. 695). Here, the IT unit is equated with a company. Based on their similarity, it is derived that the respective strategies have similar contents: just as a company needs a mission and makes choices about its customers, products, core competences, etc., so does the IT unit. We also find this comparison in the IS literature in statements such as "running IT like a business" and viewing the IT unit as a "business within a business" (Ragu-Nathan et al. 2001) (see Chapter 2). While similarities may exist between the IT unit and a company, it is also important to pinpoint the differences between the two. For example, an IT unit is part of a company rather than a company in itself. The IT unit is integrated into a hierarchy of control. Hence, it does not have autonomy over all the decisions a company has (e.g. whether or not to serve certain customers, determining product prices, etc.). The IT unit cannot be considered a company unless it has been hived off as an independent business unit. In this case, the structure of the business strategy of such an IT service provider is similar to the structure of the business

strategies of other IT services providers or any other company. It is important to note that this strategy is in fact a business strategy and not an information strategy. The demarcation between the two might be blurred because in this case, IP-related services are also products of the provider.

Ad 2: Looking at transferring the components of business strategy to information strategy: while the terms get transferred, the underlying theory gets lost in the analogy. For example, core competences are seen as a basis for extending the scope of the company and gaining competitive advantage (Prahalad and Hamel 1990). These core competences get translated into IT unit staff's skills like "speaking English fluently" or an "project management" ability. On the one hand, these "competences" cannot serve as a basis for extending the scope extension or competitive advantage of the IT unit. It is not even clear whether competitive theory (and hence the term "competitive advantage") can or should be applied to company-internal functions.

Ad 3: Clarifying the consequences for information strategy content: from the previous paragraph, it should be clear that reasoning solely from analogy could result in the loss of certain strategic IP decisions, namely those on how IT can affect the scope and competitive advantage of the overall company (in contrast to the IT unit). The IP decisions derived from analogy can only be part of information strategy if one understands information strategy as a business strategy for the IT unit. This is applicable if an IT unit is run as a profit center and potentially serves external customers. In that case it needs a strategy for determining its market, its customers, etc. Information strategy understood in this way is equal to the business strategy of an (external) IT service provider. This comparison shows that this line of reasoning cannot serve as a sufficient basis for constructing an information strategy for the whole company. For example, if the entire IT unit were to be outsourced all strategic IP decisions would be made by the outsourcing provider with such an information strategy. This might not be in the company's best interest due to potential conflicts of interest. Of course, analogy may be used as a communication or motivational device (case 4: common mission and vision to motivate IT unit staff). Such "figurative analogies" "may be dismissed as being merely rhetorical […] They may be helpful as ways of making some point clearer, but they cannot actually warrant any claim" (Toulmin et al. 1984, p. 217). One has to be aware of the limitations of analogy. Analogy should not be used as the sole form of reasoning for information strategy content, because it omits important aspects and could potentially cause alignment problems. "Managers who wish to […] sidestep [analogy's] pitfalls must master multiple modes of thought"

(Gavetti and Rivkin 2005, p. 10). The other types of reasoning discussed below might represent some of these modes of thought.

3.2.3 IP decisions reasoned as strategic from cause: Strategic impacts

In a third type of reasoning, interviewees argued that the decisions cause a desired effect: transforming the company into a desired state or helping it to reach a certain objective that they deemed strategic. This line of reasoning is based on a causal relationship rather than on structural similarity or signs: if the decision is made, a desired state is reached. This logic is found in Table 32 (reasons 1-18) as well as in Table 33 (reasons 33-35).

The interviewees talked about the following effects (see Table 32 and Table 33):

1. Effects related to business strategy: the decisions fulfill requirements of business strategy (reasons 1-3, 5), help to ensure that these requirements get fulfilled (reasons 4, 8, 9) or change business strategy formulation (reason 6).
2. Decisions that help to satisfy business units' requirements or to gain acceptance from business units (reason 7, 35)
3. Effects concerned with IP cost containment: the decisions lead to a reduction of IP costs through scale effects and synergies (reasons 10, 11).
4. Decisions that affect the company's flexibility: the decisions aim at supporting (or at least not hampering) the company's ability to react to external or internal changes (reasons 12-16).
5. Decisions that help to avoid or mitigate IP complexity: the decisions reduce complexity or prevent business units from causing complexity to preserve the IT unit's ability to deliver IT services: (reasons 17, 18).
6. Decisions that aim at avoiding critical impacts on operational security and continuity (reason 34)
7. Decisions made for political reasons: the decisions aim to fulfill political goals (such as strengthening the autonomy of a business unit) (reason 33).

We discuss the decisions argued to cause any of these effects in the following paragraphs:

Ad 1: Effects related to business strategy

A number of decisions were argued to have effects on business strategy. They either aimed at fulfilling requirements of business strategy (reasons 1-3, 5), helped to ensure that these re-

quirements get fulfilled (reasons 4, 8, 9, 35) or change the formulation of business strategy (reason 6).

Decisions that fulfill or ensure fulfilling requirements of business strategy

Decisions were argued to be strategic because they fulfill requirements of a chosen business strategy. Two quotes help to illustrate this reasoning:

> 81: wir brauchen neue Geschäftsfelder, neue Geschäftsmodelle, für die wir eine neue IT brauchten. Konkret jetzt in dem Kontext, wir […] wollen stärker rein in den Bereich Krankenhaus, Krankenhausdienstleistungen. Und darüber wurde natürlich ein ganz neues Produkt und [damit auch] ein ganz neues Anforderungsprofil an so eine EDV Landschaft notwendig. (case 3)[35]

Here, the business strategy foresaw to enter into new areas of business (i.e. extend the scope of the company). The chosen business strategy poses a number of requirements on IP and hence, IP decision have to be made in order to fulfill these requirements. In the quote, the whole application landscape had to be redesigned and new applications were needed to reflect the functionality needs of the new products to be offered.

> 719: Also was bei uns auch Thema der Konzern-IT-Strategie ist, […] ist IT-Sicherheit […]. Das hat eine strategische Bedeutung, weil es […] was zu tun hat mit der Frage, wie effektiv kann der [company]-Konzern Firmenübernahmen durchführen oder auch Firmen wieder desintegrieren. […]Und das ist natürlich auch eine der strategischen Geschäftsanforderungen des [company]-Konzerns, zu sagen, das möchte ich […] können, und da muss dann natürlich auch der IT-Sicherheitsecke heraus eine Antwort drauf gefunden werden. Deswegen ist das bei uns auch ein strategisches Thema. (case 11)[36]

In this second example, the business strategy foresaw to refocus the company's areas of activities (i.e. the scope of the company) through mergers that help to enter into new markets or to extend in existing markets as well as through disinvestments of areas that shall be discontinued. Again, in order to be able to conduct such strategic initiatives (mergers, disintegrations) the company is building an ability to integrate new companies and disintegrate existing parts of the business quickly and smoothly. The company recognized that it needs an ability in order to make use of it when pursuing the business strategy. Whenever the company conducts

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[35] Translation by author: "81: we need new business areas [in the sense of areas where the company is active], new business models, for which we need new IT. In this context, we […] wanted to go more into the business with hospitals, services for hospitals. And this way, we required a completely new product and [hence in turn] a completely new set of requirements for the EDP landscape" (case 3)

[36] Translation by author: "719: So what is also a topic of the corporate IT strategy is […] is IT security […]. That has strategic significance, because it […] has to do with the question of how effectively can the [company] group conduct acquisitions or disintegrate companies again […] And that is of course one of the strategic business requirements of [company] group, to say, this is what I want […] to be able to, and of course, I have to find an answer to this from the point of view of IT security. This is why this is a strategic issue. (case 11)

a merger it makes use of such a "merger and disintegration capability". Here, it is argued that IP security plays a significant role in this capability. Hence, again the business strategy poses requirements on IP. The IP decisions that aim at fulfilling these requirements are regarded as strategic.

The two quotes also demonstrate that interviewees subsumed different aspects under the label "business strategy". Among these aspects were decisions on the scope of the company, (see the first example above (case 3): growth through product development (case 3) or using new distribution channels (case 13); case 6 provides an example of expanding the geographic scope of the company by entering into new regions), the vehicles used to change the scope of the company (see the second example above (case 11): growth through mergers and acquisitions) as well as differentiation from competitors (e.g. through being a low cost provider (case 12)). However, all these aspects subsumed under the label "business strategy" have in common that they are market oriented: they determine which markets the company serves, how it enters new markets or how it differentiates itself from other players on the market.

In these cases, interviewees regarded business strategies as given and as posing requirements on IP. The IP decisions were considered strategic because they influence whether the chosen business strategy can be pursued. Hence, the decisions either facilitate or stymie business strategy execution:

- If the applications and application platforms within the application landscape cannot handle the targeted growth in volume, the growth strategy cannot be implemented. Hence, IP must be prevented from becoming a disabler of the chosen strategy (decision area a, case 3).
- Automating business processes through information systems can reinforce a low-cost strategy by allowing the reduction of business process costs (decision area a, case 12).
- Deciding to use standard software for processes that are essential for differentiation can hamper a differentiation strategy (decision area b, case 5).
- The decision to make systems compliant with certain audit rules was seen as strategic because it was a prerequisite for executing the business strategy: otherwise, the strategy of going public would have been forestalled (decision area b, case 9).
- Deciding to prescribe technology standards for systems that require differentiation (and might only be implementable with a specific technology) can handicap a differentiation strategy (decision area c, case 5a). On the other hand, following technology standards can

support a low-cost strategy (decision area c, case 12); beyond the decision of whether to set technology standards or not, the selection of which technology standard to employ has to be made in line with business strategy. For example, a low-cost strategy was argued to be better supported with low-cost technologies (e.g. open source databases), whereas a rapid time-to-market strategy was argued to be better supported with programming languages and tools able to support rapid prototyping (decision area c, case 8).

- A low-cost strategy can be supported by cutting IT operations costs, e.g. through standardizing IP processes company-wide (decision area d, case 12).
- The selection of projects to pursue (i.e. the project portfolio) has to reflect the company's strategic priorities (decision area e, cases 11, 13).
- For a chosen business strategy, individual projects have to be started in order to execute it. For example, if a business strategy foresees developing a new product, applications are needed to support all activities (e.g. sales) related to the product (decision area g, cases 6, 13).
- Allocating IP decision rights between the business units and the corporate center have to be made in order to avoid hampering a given business strategy: centralizing decision rights will impede business areas from differentiating themselves through the use of IT; likewise, decentralizing IP decision rights might thwart a low-cost strategy (decision area j, cases 7, 8).
- Outsourcing certain IP activities may harm business processes that require differentiation through IT and that the outsourcing partner cannot provide economically (decision area k, case 5).
- If IT security rules are not designed to ensure the rapid integration of acquired companies (i.e. ensure access to corporate data) or are disconnected from disinvested companies (i.e. no longer have access to corporate data), a strategy based on mergers and acquisitions as well as on disinvestment might be hampered (decision area l, case 11).

Some of these decisions were argued to be strategic not because they fulfill requirements of business strategy themselves, but because they ensure that the requirements for IP get fulfilled or that fulfilling the business requirements is not hampered. In other words, the decisions did not aim at providing a certain deliverable themselves, but aimed at ensuring that these deliverables get built or at avoiding that certain required deliverables get affected negatively.

> 829: […] wenn jemand [von der Geschäftsseite] eine neue Idee hat, dann kommt er zuerst zu mir und sagt: Oh, ich habe eine Idee, ich will das und das machen. Ich sage: Pass mal auf, was willst Du machen? […] Und dann musste ich sehen, ob die bei uns rein passt. Weil ja bestimmte formale Faktoren, ein Hardfact ist zum Beispiel, wir wollen nur noch alles barrierefrei machen. Wenn der also mit Javascript ankommt, mit Spezialzeug, das ist nicht barrierefrei. Tolle Sache, die Du haben willst, aber nein, sie wird nicht, weil wir haben strategisch festgelegt, die IT-Strategie ist Barrierefreiheit. Das passt nicht rein. Flash-Animation, also ein Blinder und die aufpoppenden Bilder […] Keine Chance […] Das Marketing sitzt da und weint: Ich will Flash. […] Es geht nicht […] (case 10)[37]

In this example, the pure-online bank had decided to enter into a new market by also targeting blind customers. An IP decision that was argued to be strategic is setting rules that limit the technologies available to business units to those technologies that can be accessed by blind customers. Allowing business units to use certain technologies (that are not accessible to blind customers, such as "Flash") would lead to applications that hamper this strategy (due to the inaccessibility to websites using this technology for blind users). Here, the strategic IP decision does not aim at providing deliverables required for the strategy (e.g. an application for selling the products to blind customers), but ensures that these requirements get fulfilled (i.e. all applications are accessible to blind customers).

In a sense, these decisions aim at regulating business units or incentivize them to act in a desired (here: strategy-conforming) way (reasons 4, 8, 9). These decisions included the following:

- Architectural standards were argued to be rules that have to be followed company-wide and therefore constrain business units (decision area c, cases 3, 11a, as well as the example from case 10 quoted above).
- Decisions on rights and accountabilities were seen as strategic because they ensure that business units act in a desired way (decision area j, cases 2, 6b). Another solution to the same problem was to introduce charging mechanisms that allowed the IT unit to make certain investments with the monetary gains (case 3). In case 8, the reason was that governance decisions constrain the business units from acting freely and only for their own good.

[37] Translation by author: "829: […] if someone [from business] got a new idea, then the first thing he will do is to come to me and say: Oh, I got an idea, I want to do this and that. I say: wait a minute, what do you want to do? […] And then I have to check whether it fits. Because certain formal factors, one hard fact is for example that we want everything to be barrier-free [accessible online for blind customers]. So if he wants to use Javascript, with special stuff, that is not barrier-free. Nice things that you want to have, but no, it's not going to work, because we have made the strategic decision, the IT strategy is being barrier-free. And that [idea] does not fit. Flash-based animation, a blind person and these pop-ups […] no chance […] the marketing department sits there and cries: I want Flash […] but its not allowed […]" (case 10)

- An important prerequisite for strategy implementation were IP staff skills (decision area h, case 6). Obviously, without the right skills, no plan can be implemented. This could also affect how well business strategy can be supported or enabled through the use of IT.

Decisions that change business strategy formulation

In case 3, it had been decided that the IT unit should also serve the external market with IT services and products (i.e. a change in the role of the IT unit: decision area i), which effectively changed the scope of the company:

> 282: wo ist ein Markt, wo [company] tätig ist, wo auch IT eine Rolle spielt: Healthcare – fein, Krankenhäuser sind ein hochproblematischer Bereich, keine richtige DV Lösung, also wir gehen mit [company's IT unit] ganz bewusst in diesen Healthcare Dienstleistungsmarkt.[…] Wir haben wirklich eine Firma kreiert und haben unser eigenes Produkt versucht zu positionieren. […] ein Stück Software für den Betrieb von Krankenhäusern.[38]
>
> 319: Ja wir haben gesagt hier, aus den drei Geschäftsfeldern werden vier. (case 3)

In this case of a health service provider, the business strategy was not seen as given. Instead, it got re-defined. The company made the decision to also become an IT service provider, which meant to serve existing customers (hospitals) with new products (IT services).

By definition, business strategies intend to affect the long-term performance of a company. However, we still have to discuss whether the above mentioned IP decisions fit our view of strategy in the next chapter.

Ad 2: Decisions that help to satisfy business units' requirements

The previously mentioned decisions were linked to business strategy. Some IP decisions were argued to be strategic because they fulfill any kind of requirement uttered by business units, independent of whether these requirements were part of strategy or not (reason 7).

> 181: Portfolio-Management unter anderem auch deswegen, weil das ist natürlich die engste Schnittstelle zwischen dem Business in den Geschäftsfeldern und den IT-Abteilungen. Und das ist sicherlich die höchste Erwartung an eine IT-Abteilung an eine interne IT-Abteilung, dass sie eben die Business-Weiterentwicklung in Form von IT-Projekten unterstützt und ermöglicht. (case 11)

The decisions reasoned like that included the decision on which applications are needed, which projects to include within the portfolio as well as the decision to decentralize decision rights in order to better serve business requirements.

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[38] Translation by author: "282: where is a market, in which [company] is active, in which IT also plays a role: healthcare – great, hospitals are a highly problematic area, [they have] no real IT solution, so let's move deliberately into this market of healthcare services […] We really created a company and tried to position our own product […] a piece of software for running hospitals.

Regardless of whether the requirements themselves were actually strategic or not, satisfying them was seen as strategic for the IT unit. A number of decisions were argued as either satisfying these requirements or helping to satisfy them:

- The application landscape (area a, case 3) and the application portfolio (area e, case 11) have been argued to be "the interface to […] users" (case 3) or "the tightest interface between the […] business areas and the IT units. And this is certainly the highest expectation towards an IT unit […] that it supports and enables business development in the form of IT projects" (case 11). Here, it is not the impact of the projects that is at issue but the mere fact that it is what business units want. From the point of view of the IT unit, delivering this is seen as its raison d'être.
- In case 2, it was proposed that the principle of "business rules" was the driving reason behind the policy of not setting technology standards that might limit business units as well as behind rearranging the allocation of IP decision rights to business units (e.g. giving full budgetary control to business units without any central oversight) (decision area j).

Furthermore, practitioners argued that gaining acceptance from business units was strategic (reasoning 35).

- Defining the role of the IT unit (e.g. making it a service provider) was seen as necessary for gaining acceptance from business units. This was argued to be important for implementing other decisions (decision area i, case 3a). As claimed in case 3, the lack of business unit acceptance was the main reason that other information strategies failed to be implemented.
- Shifting the rights for the decision on which applications have to be developed from the IT unit to a committee consisting of business areas was cited as important for countering the business units' criticism that the IT department had been making intransparent or unilateral decisions. Reallocating decision rights helped the IT unit to regain acceptance from the business units.

Fulfilling business requirements is an important task of the IT unit. However, not all business requirements are strategic. Hence, the meaning of strategic here is different from the meaning of strategic in the previous section. Not all business requirements are of strategic relevance to the business – only from the point of view of the IT unit, satisfying its customers' (the business units') requirements may be regarded as 'strategic'.

Ad 3: Effects concerned with IP cost containment

A number of decisions were argued to be strategic because they helped the company to stay cost-competitive by reducing IP costs (reasons 10, 11). This was achieved either through leveraging external providers' economies of scale (through sourcing, decision area k) or by increasing internal synergies. An example is provided by case 11:

> 226: Es gibt einen hohen Kostendruck auf den [company]-Konzern und die Frage ist letztlich, wie kann die IT in ihrem eigenen Betrieb kostengünstiger produzieren. Und ein Hauptthema sind natürlich Skaleneffekte, die man realisieren kann, Wiederverwendbarkeit, Mehrfachnutzung. Und das ist jetzt der Schwerpunkt der IT-Strategie, dass wir gucken, in welchen Bereichen könnte man denn, wenn man es gemeinsamer macht, einfach die Kosten senken. (case 11)[39]

The aviation company is threatened by the entrance of new low-cost carriers. It tried to stay competitive (N.B.: it did not try to become a cost leader) through lowering overall cost, including IP cost. Hence, although the company did not follow a low-cost strategy itself, the reduction of IP cost was regarded as strategic. The reason was that IP cost represented a huge part of the overall cost and hence played a role in determining whether the companies stayed competitive.

However, practitioners were also somewhat hesitant to argue these decisions as strategic. For example, in case 6, the interviewee stated that the company was sensitive to cost on the one hand, but he also argued that mere cost-cutting would not be viewed as strategic.

> 214: Also ich denk was durchaus strategisch ist, ist natürlich, dass wir sehr kostenbewusst sind, eigentlich kostengetrieben natürlich. Obwohl die Bank relativ stark wächst oder dürfen natürlich die Kosten nicht linear mitwachsen, das ist, das versteht sich von selber. (case 6)
>
> 243: Also ich habe immer etwas Mühe, wenn wir von reinen kostengetriebenen Aktionen von Strategie reden. […] rein kostengetriebene Aktionen, ob die jetzt wirklich strategisch sind sei dahingestellt (case 6).[40]

In a similar vein, the interviewee in case 5 argued IP cost to be a strategic cost factor but that decisions that purely aim at reducing IP costs were strategic with "second priority":

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[39] Translation by author: "226: There is a high cost pressure on [company] group and at the end of the day, the question is how can the IT unit produce its own operations cheaper. And one main topic are scale effects that can be realized, reuse, multiple use. And that is now the main focus of the IT strategy, to look out for areas where costs could be reduced by doing it jointly.

[40] Translation by author: "214: So what is potentially strategic, is of course, that we are very cost-aware, actually cost-driven. Although the bank is growing, costs must not grow linearly, that is self-evident" (case 6). "243: I am always having trouble, if we use the term strategy when we are talking about purely cost-driven activities. […] purely cost driven activities, if they are really strategic is open for discussion." (case 6)

> 309: Geschäfte funktionieren auch, wenn Sie 7 redundante Systeme haben. Aber man verliert auf der Kostenposition im Wettbewerb dann natürlich einiges an Vorteil […]diese Fragen [standardization and sourcing ...] spielen für mich eher rein in eine Effizienz der IT und sind von daher auch mit dem Anteil den die IT Kosten ausmachen strategisch, da reden wir einfach über einen strategisch wichtigen Kostenblock, aber eigentlich mit zweiter Priorität. (case 5)[41]

The decisions argued to be strategic because they help to reduce IP cost were the following:

- The decision to use standard software instead of custom-built software was argued to reduce costs. This decision typically has to be made against business units, because they tend to request custom-built systems. They do so because they assume themselves to be unique in having special requirements. In terms of cost, however, applications should be standardized and reused as far as possible as long as they do not hamper a differentiation strategy (decision area b, cases 5, 7).
- The decisions of introducing technology standards or reducing the number of technology standards were also claimed to decrease IP costs by reducing the variety of technologies that have to be maintained. This in turn increases economies of scale and synergies across business units, and helps to obtain economies of scale in procurement (decision area c, cases 5a, 5b, 8, 9, 13). Again, this decision counteracts the business units' tendency to want whatever technology fits best
- Similarly, standardizing IT processes was argued to reduce IP costs by creating synergies across the company (decision area d, case 11).
- Centralizing IP decision rights also has a cost-reducing effect (decision area j, cases 5b, 7).
- Outsourcing certain IT activities was again argued to reduce costs because the external provider could offer economies of scale (decision area k, cases 4a, 5, 11).

We follow practitioners by not viewing all decisions that reduce cost as strategic per se. Of course, cost reduction impacts firm performance. However, the question is whether the decision aims at a long-term increase in firm performance or simply a short term "operational" relief. For example, other than the decision to cut down e.g. the number IP projects, the decisions to set technology standards as well as the decision to centralize IP decision rights do not

[41] Translation by author: "309: businesses also work if you have 7 redundant systems. But you lose some advantage regarding the cost position in competition […] these questions [standardization and sourcing ...] play a role for the efficiency of IT in my point of view and hence are strategic with the share of IT cost they represent; we are talking about a strategically important share of the cost, but with second priority" (case 5)

aim at reducing IP cost in the short term. They are meant to ensure that cost stays in the focus in future decisions. They might in fact play a role in building an ability to contain IP costs continuously. Such an ability would be benefitial (and probably a prerequisite) when following a cost leader strategy in order to maintain a competitive position. However, it would also be needed for companies with other strategies in order to survive as the interviewee in case 11 argued (see quote above). These decisions may be viewed as aiming to avoid competitive disadvantage through a loss of cost competitiveness. They may represent a trade-off between optimally executing present business strategy and keeping the long-term cost competitiveness of the company. Hence, we will have to discuss these decisions in the next Chapter.

Ad 4: Decisions that affect the company's flexibility

A number of decisions were argued to be strategic by virtue of affecting a company's ability to react to predictable and unpredictable changes, i.e. its flexibility. These changes might be caused by both external and internal factors (reasons 12-16). The following three quotes serve to illustrate this reasoning:

> 81: […] wie baue ich sie [die Applikationslandschaft] denn am Besten so, dass sie auch wenn sich die Welt drum herum in den nächsten 10 Jahren verändert, immer noch weiter verwenden kann. (case 2)
>
> 75: Ich denke mir, wir können uns auch durch diese Strategie eben und durch diese Unabhängigkeit der IT eben auch schnell auf veränderte Situationen einstellen, wenn die Bank sich entscheidet im strukturierten Produktebereich sich zu verstärken, dann können wir das IT-mäßig sehr schnell umsetzen. [Denn] Wir brauchen nicht lange Entscheidungswege um solche Sachen nachzuvollziehen. Gutes Beispiel z.B. die Expansion im asiatischen Raum. [...] das war natürlich auch nur möglich, weil wir unabhängig [vom Konzern sind in der IT-Entscheidungsfindung ...] die Expansion der Bank […] optimal und schnell und unbürokratischer denke ich auch, als wenn wir bei der [name]Group wären, umsetzen. Also da sind wir, wir können in No-Time eigentlich irgend eine neuen Repräsentanzen aufstellen, in Monaco […] Libanon, Beirut, […] Dubai […] Jakarta [...] (case 6)
>
> 117: […] weil das Business natürlich sehr schnell, sehr flexible Lösungen haben will. Longterm-mäßig funktioniert das einfach nicht über alle Grenzen hinaus, […] da muss man schon eben diese Grundsätze z.B. auch eben die Enterpriseplattformstrategie […], das muss man einfach unterstützen, um nicht mit jeder neuen Anforderungen auch hinten durch neue Infrastrukturen aufbauen zu müssen […]. Das wird dann wirklich teuer. Wenn wir uns wirklich auf diese Grundsätze berufen können und darauf abstützen können, dann denk ich, sind wir relativ vielmehr in der Lage mit unwesentlich steigenden Maintanance- oder Produktionskosten die Bank in ihrem Wachstum einerseits, aber auch in der Ausrichtung vom Geschäft her, neue Geschäftsfelder, einigermaßen schnell zu supporten. (case 6)[42]

[42] Translation by author: "81: […] how do I build [the application landscape] in a way that I can still use it, even if the world around it changes in the next 10 years?" (case 2)

Here, the interviewees acknowledge that the environment of the company changes. They recognize that the company might have to react to these changes (e.g. through introducing new products or changing existing product offerings). These reactions will in turn change the requirements that are posed on IP (see "Ad 1" above). However, in this type of argumentation, the requirements are not fully known (either it is unclear whether changes will happen, when they will happen or what kind of changes will happen). Hence, the company has to make prerequisites that enable it to deal with the changes smoothly when they occur: the company has to build an ability to react with the help of IP to changes (i.e. to build IP-based flexibility). IP decisions were argued as strategic if they either facilitate or hamper the company's flexibility. Interviewees argued that a number of decisions play a role in a company's ability to deal with change:

- The application landscape has to be designed so that it will still work even in the face of unpredictable changes in the environment, which can cause unpredictable changes in the business units' requirements (decision area a, cases 2 (see quote above) and 3).
- Setting technological standards will lock the company into these standards for a long time (decision area c, cases 1, 10). Being tethered to a certain technology is a problem in that some technologies might make certain new business requirements difficult to implement; building up new technologies takes a long time and hence hampers a company's flexibility. Hence, the decision has to be made deliberately and cautiously, with an understanding of all the kinds of dependencies and side effects that might result from that technology (case 1).
- Setting technology standards was also seen as a necessary precondition for a quick response to new business requirements (decision area c, case 6a (see quote above)): a stan-

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"75: I think, we can adapt quickly to changed situations due to this independence of IT; if the bank decides to change in terms of products, then we can implement that with regards to IT very quickly. [Because] We do not need long chains of decisions to realize these issues. A good example is e.g. the expansion into Asia […] that was of course only possible, because we are independent [from the group in terms of making IT decisions]; we can implement the expansion of the bank, optimally and in a fast and a much more unbureaucratic way, I think, as if we were integrated [decision-wise] into the [company] group. We are actually able to set up a new subsidiary in almost no time, in Monacao […] Lebanon, Beirut, […] Dubai […] Jakarta [...] (case 6)

"117: […] because business of course want to have very flexible solutions very quickly. But that is not going to work forever in the long term […] you have to support certain principles, e.g. this enterprise platform strategy […], in order to not be required to build new infrastructures in the back for each new requirement […]. That is going to be really expensive. If we can rely on our principles, then, I think, we will be much more and much easier able to support the growth of the bank on the one hand and the determination of the scope – new areas of business – with marginally increasing maintenance and production costs" (case 6)

dardized infrastructure allows to react to new requirements much quicker and in a less cost-intensive way.

- The use of standardized technologies was seen as facilitating organizational (internal) change: frequent reorganizations within the company require the consolidation of data and systems, which is much easier if the systems use the same technology (case 5a).
- IP process standards were also argued to influence a company's flexibility: for example, if rapid prototyping process models for software development are used (e.g. the Rational Unified Process) rather than waterfall-like process models, the IT unit will be able to react more quickly to changing business requirements (decision area d, case 12).
- The ability to make IP decisions independently from the corporate center was regarded as a necessary precondition to react to as-yet-unknown local needs in an efficient (i.e. unbureaucratic) way. This independence also facilitates a rapid response time to changing business needs (decision area j, case 6a (see quote above)).
- The design of an IP outsourcing agreement was also argued to be a potential disabler of a company's agility: for example, if the contract does not foresee certain changes or provide the ability to renegotiate new requirements, pursuing these changes might be too costly and hence render them impossible to implement (decision area k, case 10).

In summary, various IP decisions are seen to play a role in a company's ability to deal with change. Notably, it is not only the aim to positively influence flexibility but also to mitigate a stymieing effect of IP decisions on the company: the application landscape runs the risk of obsolescence in the face of change. In addition, IT standards and outsourcing decisions lock the company in and could potentially render it unable to maneuver quickly. Furthermore, the emphasis was on the ability to react to changes rather than to induce change or seek opportunities for change.

Ad 5: Decisions that help to avoid or mitigate IP complexity

Decisions were also argued to be strategic if they ensure that the company (usually through the IT unit) stays in control of IP complexity: if these decisions were not made, the IT unit would no longer be able to deliver IP services effectively and cost-efficiently to business units (reasons 17-18). Then, the execution of business strategy through the use of IP would be hampered (see "Ad 1"), business units' requirements for IP could not be fulfilled (see "Ad 2"), the company would become less flexible to react with the help of IP (see "Ad 4") and IP cost would increase due to higher efforts to deal with complexity (see "Ad 3"). In other

words, containing complexity is a major prerequisite for the IT units' ability to provide IP services which in turn affects the company's ability to act on the basis of IP.

Hence, in comparison to the previous effects, the ability to control IP complexity is even more fundamental: if this ability is not present, the company will not be able to support any business initiatives (strategic or otherwise), regardless if induced by frequent change or not. As the interviewees argued, this ability to deliver IP services in a cost-efficient and effective way is eroded by the "short-sighted view" of the business units (cases 4 and 10): because they want their immediate needs fulfilled in the cheapest and most effective way they increase IP "entropy" (case 8). Hence, either business units have to be regulated or incentivized to stop acting in that way. Alternatively complexity has to be accepted as given and an ability to deal with complexity and still be able to deliver IP services in an appropriate way has to be built up. The following quotes illustrate this reasoning:

> 446: […] Strategie und [insbesondere] Governance schon irgendwo Dompteur für die an sich sehr autonomen Agenten und auch divergierenden Agenten. Weil jedes Business irgendwo, das ist auch im Menschen dann psychologisch verankert, ist besonders und speziell und die Anforderungen sind besonders und speziell. Und jeder will eigentlich die geniale Lösung haben […] Und damit hat man so eine Entropie und dem muss natürlich die IT-Strategie und Governance entgegenwirken. (case 8)

> 309: Architekturen sind absolut strategisch, die entscheiden darüber, ob man lieferfähig ist oder nicht lieferfähig ist [als IT Abteilung] […] Sustainability […] stellt aber sicher, dass sich Effektivität oder Effizienz nicht in kurzfristigen Dingen erschöpfen, sondern langfristig wirksam sein können. Architektur stellt diese Sustainability sicher, die oft auch von den Business Areas nicht in gewünschtem Maße eingespielt wird. […] Klar, die wollen es in den ersten 2 Jahren alles haben, was ich verstehe. Aber da müssen wir halt auch mal eine Gegenperspektive anbringen, deshalb definieren wir hier Architektur (case 4)[43]

The quotes emphasize both, the assumption that business units (inherently, but not delibereately, as a side-effect of pursuing their own interests) increase IP complexity if left unregulated (IP complexity in this context is largely characterized by the amount of different technologies used). This complexity is not sustainable and has to be countered in order to pre-

[43] Translation by author: "446: […] strategy and [especially] governance are somehow a dompteur for the autonomous and divergent agents.Because every business somehow, that is ingrained in people psychologically, is different and special and their requirements are different and special. And everybody actually wants the ingenious solution […] And this causes entropy which you have to counter with IT strategy and governance" (case 8)

"309: architectures are absolutely strategic, because they determine whether you [as the IT unit] are able to deliver or not […] Sustainability […] ensures that effectiveness and efficiency are not limited to the short term, but are valid longer term. Architecture ensures this sustainability, which is often not considered by business ares […] Clearly, they want everything in the first 2 years, and I understand that. But there we simply have to introduce a counter perspective, this is why we define an architecture here" (case 4)

serve the company's long-term ability to act with IP. IP decisions are strategic because they help to contain IP complexity and in consequence foster the company's ability to act on the basis of IP (e.g. launch IP-based initiatives). These IP decisions represent a counter-perspective with regards to business units and their requirements and might eventually counter the smooth execution of a business strategy. Hence, setting technology standards or distributing decisions rights and accountabilities might have to deliberately "dis-aligned" with business strategy. Again, these decisions lead to trade-offs e.g. between supporting business strategy (see "Ad 1") in the easiest way and preserving the mentioned fundamental ability to act based on IP.

The following decisions were reasoned to be strategic in this way:

- Setting technology standards was regarded as being helpful in regulating business units from introducing a "technology zoo" that is too costly and complex to maintain, hence eroding the ability to integrate systems easily (decision area c, cases 4b, 6a, 8).
- Relying on certain process standards (case 6) or bolstering the IT unit's ability to deal with all kinds of technologies (because in the latter case it was supposed that no standards should be set in a decently run company) were means of coping effectively with high complexity (decision area d).
- In cases 2 and 9c, process standards were seen as a way to reduce potentially stymieing IP complexity. In case 2, an evolutionary approach to changing the architecture (rather than a "big bang" approach) was argued to be easier to handle and thought to reduce the risk of spinning "out of control": a big-bang approach might lead to unmanageable consequences. In case 9, having many different ways of conducting IP processes (e.g. software development) increased the complexity of steering the processes.
- In case 4a, the need to adapt the culture of the IT unit in order to avoid future "silos" (decision area h) was acknowledged.
- In case 8, centralizing IT decisions was also seen as a way to "counter" the business units' tendency to increase IP complexity.

Interviewees saw these decisions as a way to "counter-balance" business units. On the one hand, they felt that IP decisions had to be made so that they would not hamper – or even support or enable – business units from conducting their chosen or future strategic initiatives. On the other hand, the (same) decisions are made to regulate and counter business units in order to retain control over IP.

Ad 6: Decisions that aim at avoiding critical impacts on operational security and continuity

Some IP decisions were argued (reason 34) to be strategic because they aimed at avoiding critical impact on business operations and business continuity through security threats or disasters (hackers, viruses, natural disasters, etc.)

> 591: wenn wir irgendwo ein Sicherheitsleck hätten, dann können wir das Unternehmen dicht machen. (case 10)[44]

Breakdowns of operational IS can impact firm performance. For example, customers cannot access the web site of the company in order to make transactions. In the extreme case – e.g. if the company is only accessible to the customer online (such as in case 10) – the company is not existent for the customer when the systems are offline. Hence, decisions on IT security and continuity measures have to be made in order to ensure that business operations can continue (decision area l, cases 4, 7, 10, 12, 13).

As argued in case 12, security and continuity decisions become more and more important due to climbing external threats from a rising number of viruses, hackers or even terrorist attacks. Deciding on an appropriate level of security and continuity measures is a trade-off between the required investments and inconveniences on the one hand and the potential downside of a damage on the other (case 13).

However, the question is whether decisions concerning security and continuity are strategic. The reasoning used here, to appeal to the critical impact on business operations is a purely operational one (as the name implies already). Ensuring that operations continue is not strategic per se.

Ad 7: Decisions made for political reasons

Two decisions were argued to be strategic due to their politically sensitive nature (reason 33): in case 11, the application portfolio decision was seen as a political decision because it involves trade-offs between stakeholders, all of whom have their own interests. Hence, it was claimed, this decision could only be resolved by top management. The implication was that all decisions made by top management are strategic. In case 6a, maintaining independence from the corporate group in terms of IT decision rights was also seen as a relevant topic for company-internal politics: if the company had not been independent in terms of IT decision-

[44] Translation by author: "591: if we had a security whole somewhere, then we could close our company" (case 10)

making, it would have been easier to integrate the company into the corporate group which would have reduced the company's degree of freedom. Not all politically sensitive decisions are also strategic. We also see indications that not all strategic decisions are being made by top managers in other areas (Varadarajan and Clark 1994). Hence, we do not consider this reasoning further.

* * *

This chapter described and classified the decisions that formed part of practitioners' information strategies as well as their reasons to argue the decisions as strategic. In the next chapter, we will have to assess inter alia whether these reasons really warrant viewing the decisions as strategic. As argued above, we will concentrate on reasoning from cause in this assessment.

4 PRACTICABILITY AND RATIONALE OF INFORMATION STRATEGY

In the previous two chapters, we identified IP decisions considered as part of information strategy in both the research literature (Chapter 2) and practice (Chapter 3). The ensuing question with respect to the objective of the thesis is which of these IP decisions can be reasoned to be strategic as well as practically relevant. To this end, we need to weigh the arguments for the practical relevance and theoretical backing of the proposals found in literature (Section 4.2) as well as of the proposals found in practice (Section 4.3). The next sections describe our approach to weighing the arguments and present the results.

Especially concerning theoretical backing, we need to come to a clearer perspective on what is strategic. After having described in the previous chapters what academics and practitioners each view as strategic, we need to establish our own view of strategy. Doing so allows us to evaluate the other proposals against this view. Hence, we first revisit the discussion on strategy.

4.1 STRATEGY REVISITED

We sketched the meaning of the term "strategy" in Chapter 1, broadly defining it as an integrated set of directional and difficult-to-reverse decisions that are made deliberately with the expressed intention of influencing a company's long-term performance. Now we would like to elaborate upon this broad understanding and demonstrate that there are indeed good reasons to adopt this view of strategy.

As indicated in Chapter 1, although there are discussions on what is and what constitutes strategy, there is no final consensus and hence no all-inclusive framework of strategy. This lack of accord is underscored by the diverse understandings of "strategic" found in the literature on information strategy (Chapter 2) as well as in practice (Chapter 3). Faced with this dilemma, it is helpful to go back to the roots of strategic thinking in military strategy. The word "strategy" stems from the Greek "strategos" for "general" which in turn means "army" and "lead" (Bracker 1980). Many authors therefore infer the concept of strategy is rooted in ancient Greek militaristic thinking (cf. Cummings 1993). Carl von Clausewitz (1976)[45] is credited with giving the term its modern meaning and with being the first to draw parallels

[45] The original work "Vom Kriege" was published in 1832.

between military and business, thus paving the way for the transfer of military thinking into economics (cf. Müller-Stewens and Lechner 2001).

Clausewitz (1976, p. 160) defined strategy as "the employment of the battle as the means towards the attainment of the object of the War." In this role, "[s]trategy forms the plan of the War". He viewed strategy as a deliberate expression of will, guiding the decisions that come afterwards: "Strategy must go with the Army in the field in order to arrange the particulars on the spot".

He goes on to state that "[p]roperly speaking it [strategy] has to do with nothing but the battle, but its theory must include in this consideration the instrument of this real activity – the armed force – […] for the battle is fought by it, and shows its effects upon it in turn" and that strategy "must […] give an aim to the whole military action, which must be in accordance with the object of the War" (p. 160). Hence, military strategy determines foremost which battles to fight. However, it is also about the resources needed to fight these battles. It includes the logistics (i.e. the "assembly of forces" in time and space (pp. 200)) but also encompasses ensuring the morale of soldiers as well as the "continual development of new forces" (p. 207). These considerations are also strategic in that they are intended to serve the objective of war. If they were not, they would not be counted as strategic, because "How could any one in fact justify in the eyes of reason the expenditure of forces […], if acting was not the object? The baker only heats his oven if he has bread to put into it […]" (p. 216).

Hence, besides choosing the battles to fight and the opponents with whom to fight them, strategy has to take care of the prerequisites that allow leading the chosen battles. This includes e.g. the armies' skills (e.g. building naval warfare skills), their willingness to fight and succeed (e.g. through incentives) and the organization of the armies.

Building on these thoughts, we view business strategy on the one hand to be about positioning the business system in the market by choosing the environment of the system: the choice of markets (including competitors) in which to make market offerings and the kind of market offerings to make. This follows the notion of choosing opponents and battles.

On the other hand, akin to the notion of the "armed forces", business strategy has to take care that the prerequisites necessary to fulfill the requirements of the chosen markets and market offerings are built. These prerequisites take time to set up and are critical in fulfilling the company's objective (success in terms of survival and long-term performance or prosperity (Grant 2005, p. 18)). According to the logic of building potentials raised by Clausewitz with the analogy to bakeries above, these potentials are strategic because they are targeted to fulfill

the market requirements or to serve the market offerings and hence intended to influence long-term performance.

Alluding to the morale and organization of the army, strategic decisions also have to ensure that these potentials are actually built, maintained and used to make the market offerings and hence to influence the success of the company. Thus, governance decisions (including incentive systems) are meant to influence the behavior of stakeholders accordingly. These decisions are not the decisions "on the field" (i.e. strategy execution or tactics) but rather ensure that strategy becomes ingrained in the business system and hence goes "with the Army in the field".

Table 36 summarizes our comparison of military and business strategy.

Strategy components		**Military strategy examples**	**Business strategy examples**
Markets	***What shall be accomplished on markets?***	Which battles to fights, which countries to attack, etc.	Which markets to serve in which geographic areas, etc.
Potentials	***What resources and capabilities are needed to accomplish this?***	Soldiers, ability to conduct naval warfare, etc.	Financial or human resources, ability to develop a new product, etc.
	How to set up the resources and capabilities to accomplish this?	Arrangements of battles, etc.	Organization of company, etc.
Governance	***How to steer the system to ensure that the resources and capabilities are built and used to accomplish this?***	Militaristic reporting structure, rank and promotion system, etc.	Incentive systems, etc.

Table 36: Comparison of our view of strategy with military strategy

It should not go unnoticed that historic analyses of the parallels between business and military strategy criticize that "too often it has been presumed (as opposed to being proved) that there is a continuity in the idea of strategy that leads back to its etymological origin in ancient Greece […] 'Self-evidently' strategy enters business from the military domain" (Hoskin et al. 1997, p. 2). Strategy researchers have also expressed skepticism about the contribution of military strategy thinking to business strategy thinking (e.g. Gälweiler 1981, pp. 39; Ghemawat 1997, p. 21; Grant 2005, pp. 14). The main reasons provided by these authors for this view include military strategy's antagonistic character and its focus on a specific point in time. They contend that the purpose of business strategy is not solely to defeat an enemy[46]

[46] While military strategy is often described as a zero sum game (i.e. the winner wins exactly what the loser loses), business strategy is described as a non-zero sum game (cf. e.g. Ghemawat 1997, p. 21)

(Grant 2005, p. 15) and that it is not limited to a certain time span but is ongoing (Gälweiler 1981).

Hence, grounding our understanding of business strategy solely in military strategy is not sufficient. In the previous chapter, we argued that analogical reasoning alone can be misleading; analogies between business and military strategy indeed have their limitations. We nevertheless see an illustrative value in comparing business strategy and military strategy, because the latter is less abstract and therefore probably easier to understand. At the same time, it is evident that we also have to ground our understanding of business strategy in actual discussions in strategic management literature.

Hence, the following sections relate the three parts of business strategy we identified above to discussions in strategic management to show that they can be expected to influence a firm's long-term performance. Figure 10 summarizes these parts (markets, potentials, and governance), which will be put into the context of strategic management thinking below.

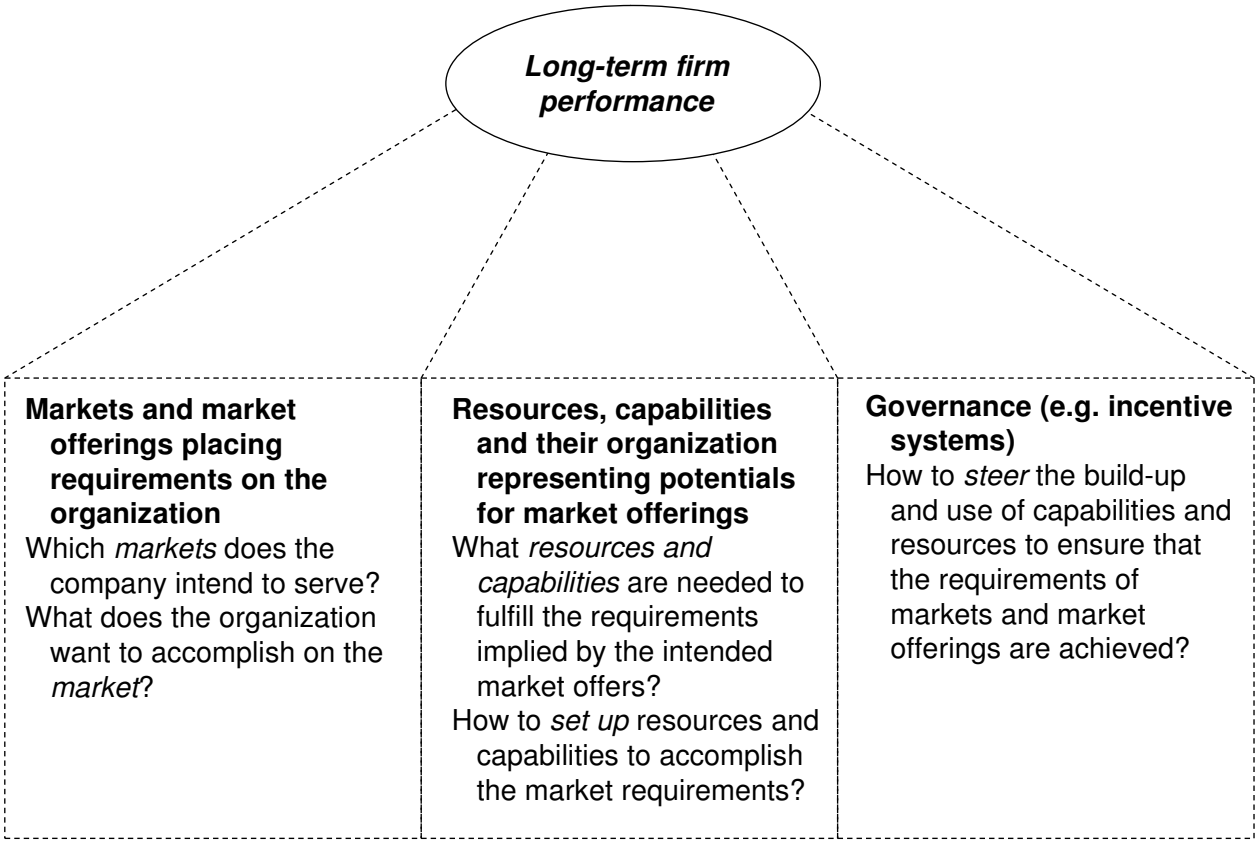

Figure 10: Strategic purposes

Markets: There is little dispute among strategy researchers that a company's decisions on the markets it wants to serve and on what it wants to offer on the markets are strategic. These decisions are typically referred to as decisions on the scope of the company as well as on how to succeed within the chosen scope through market activities. Much of the early strategy lit-

erature focused on scope decisions (especially on the question of diversification, cf. Capon et al. 1987, p. 164, 166) and especially on scope extension. Scope decisions address decisions around the question "which areas do we want to be active in?" A famous example for a view of strategy that addresses these decisions is provided by Ansoff's (1965, p. 109) product market matrix (cf. Figure 11). It depicts the decision on scope extension (the so-called "growth vector") as the choice among four alternatives: penetrate current markets with current products; develop new products for current markets; develop new markets for existing products; or diversify into new markets with new products.

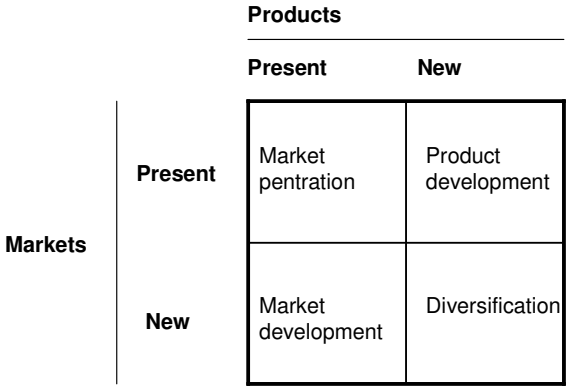

Figure 11: Ansoff's product market matrix

Another well known example is given by Miles and Snow (1978) who argue that the main decision of an organizational strategy is the decision of scope (p. 546: "alternative ways in which organizations define their product-market domains (strategy)") and the decision on how this scope will be altered.[47]

Some authors limit the understanding of scope to the decision on the product/market segments a company is active in (e.g. Ansoff 1965). Others (e.g. Hofer and Schendel 1978; Porter 1987) define scope more broadly as an organization's range of interactions with its environment. This broader definition includes decisions on the geographic scope, the choice of distribution channels and of the level of vertical and horizontal integration.

Beyond mere decisions on the market offerings, Hambrick and Fredrickson (Hambrick and Fredrickson 2001, p. 51) also include decisions on the "vehicles" of these decisions as strategic decisions. Here, the question whether e.g. the scope should be extended "by relying on organic, internal […] development, or are there other vehicles – such as joint ventures or acquisitions – that offer a better means for achieving our broadened scope". We follow this

[47] Based on these decisions they classify organizations into "Defenders" (narrow scope, defending their niche), "Prospectors" (broad scope, extending it frequently), "Analyzers" (combining both approaches for different parts of the business) and "Reactors" (unable to consequently follow any of the three other strategies consistently).

broader understanding and include all those aspects that deal with the choice of markets and offerings made within the markets as well as the requirements placed by these markets here.

Potentials: The choice of markets a firm wants to serve places requirements on the firm itself: to fulfill these requirements, the company needs a number of resources and capabilities. Unfortunately, neither of these terms is well defined in strategic management literature (cf. Chapter 2). Hence, we need to elaborate this part of strategy in some more depth. We follow Amit and Schoemaker (1993, p. 327) who are among the few authors to provide a clearer distinction by defining resources as tangible and intangible "stocks of available factors" including human resources (i.e. employees and their skills), intellectual property (e.g. patents and licenses) or financial resources.[48] In contrast, they describe capabilities as "a firm's capacity to deploy Resources, usually in combination, using organizational processes, to effect a desired end" (p. 327).

We find two types of capabilities currently discussed in strategic management literature: generic (or dynamic) capabilities and specific (or ordinary) capabilities. "Dynamic capabilities" (Eisenhardt and Martin 2000; Teece et al. 1997; Winter 2003) differ from specific capabilities in that they can be used to build new (specific) capabilities and resources. In this sense, dynamic capabilities are higher order (meta) capabilities (Winter 2003). First-order capabilities introduce change (e.g. by introducing a new product). Dynamic capabilities allow a company to rebuild and reconfigure resources and capabilities in a routine way. Examples of dynamic capabilities are organizational learning or flexibility and agility (the ability to sense and quickly respond to changes[49]) with the most fundamental dynamic capability probably being the ability to act (see zu Knyphausen-Aufseß 1995, pp. 100, for a compilation of dynamic capabilities). The notion of the relevance of dynamic capabilities is grounded in the theory of "hypercompetition" (D'Aveni 1994). The assumption is that in turbulent i.e. rapidly changing and highly competitive environments, market offerings have to be changed quickly (e.g. because competitors copy them or provide better offerings themselves). When a company must quickly provide new market offerings (or even enter new markets) this may in turn require new or changed resources and capabilities. Hence, a firm's ability to continuously respond to

[48] See Grant (1991) for a classification of different types of resources.

[49] Reasoning decisions as strategic that support the company's ability to change rather than just supporting the immediate strategic initiatives is discussed in strategic management literature under the term "agility". "Agility" is not a well-defined term in IS research: "a consensus on a definition of agility has not yet emerged" (Oosterhout 2006, p. 133). It is also not clearly differentiated from flexibility. However, most definitions state that a company's agility concerns its ability "to cope with external and internal changes, which are unpredictable and uncertain" (Oosterhout 2006, p. 133).

new market requirements (e.g. by making new or improved market offerings) is more important for its long-term performance than any specific market offering or any specific capability: "dynamic capabilities […] impact the ability of firms to launch many and varied competitive actions [in our sense: to act in the market] and […] these competitive actions are a significant antecedent of firm performance" (Sambamurthy et al. 2003, p. 237). It follows that decisions can be strategic even if they "do not directly lead the firm to a position of superior sustained" firm performance, because "they may nonetheless be critical to the firm's longer-term competitiveness in unstable environments if they help it to develop, add, integrate, and release other key resources [which includes capabilities according to the notion of these authors] over time" (Wade and Hulland 2004, p. 131). However, even the proponents of the positive impact of dynamic capabilities on firm performance recognize that investing in these capabilities only makes sense if there is a real need for continuous change (e.g. in turbulent, highly-competitive or rapidly changing markets). Investing in dynamic capabilities will otherwise constitute an unnecessary cost burden, because they will not be used frequently enough to amortize the cost of capability building (Teece et al. 1997).

Resources and capabilities represent potentials, as investments in them do not directly show in a change of performance. They only change the set of opportunities available to the firm. Resources and capabilities have to be used (applied or exploited) in order to show an effect (zu Knyphausen-Aufseß 1995, p. 95).[50]

In this sense, all those decisions that are intended to build or maintain these potentials are strategic (Gälweiler 1981) in that they affect "the system of all business-specific prerequisites that are relevant for success" (Gälweiler 1987, p. 26).[51] Kirsch (1996) even goes so far as to define "strategic" as "significantly concerning the capabilities"[52] of a company. As potentials, capa-

[50] It should be noted that we go beyond viewing only those decisions that affect 'strategic' resources according to the RBV (see Chapter 3) as strategic. Strategic resources according to the RBV should in fact be labeled "competition-relevant" resources as they are defined as resources that may be the source of competitive advantage. In fact, most "strategy theories" focus on how to gain competitive advantage. Fahey and Christensen (Barney and Hesterly 2006, p. 5) also criticize that "It has become popular to proclaim that the purpose of strategy is to create and sustain competitive advantage." In fact, many researchers define gaining and sustaining a competitive advantage if not as the only, then at least as the single most important purpose of a strategy (e.g. (Porter 1985, p. 12): "a firm's strategy is defined as its theory about how to gain competitive advantages"; (Teece et al. 1997, p. 509): "competitive advantage is at the heart of any strategy"; (Grant 1991): "The fundamental question in the field of strategic management is how firms achieve and sustain competitive advantage"). Those theories would be more appropriately termed "theories of competitive advantage" (as e.g. Grant does in his article "The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation" (Treacy and Wiersema 1993)).

[51] Translated by author; originally "Gefüge sämtlicher jeweils geschäftsspezifisch erfolgsrelevanter Voraussetzungen".

[52] Translated by author; originally "die Fähigkeiten signifikant betreffend".

bilities and resources are relevant for success because they are needed to fulfill the market requirements and to make the market offerings which ultimately affects firm performance. Decisions on using, building and preserving these potentials are then strategic, as well. The question here is "Which potentials are needed to be able fulfill the market requirements and the decisions with regard to markets (such as to make the intended market offerings)?"

In addition to the resources and capabilities themselves, the question of how they are set up or organized in order to enable the market decisions is a strategic aspect, as well (zu Knyphausen-Aufseß 1995, p. 93). This becomes particularly obvious in management concepts such as business process reengineering (BPR) (Davenport 1995; Davenport and Short 1990; Hammer 1990) or core competencies (Prahalad and Hamel 1990).

BPR has been defined as "a radical redesign of broad, cross-functional business processes with the objective of order-of magnitude performance gains, often with the aid of information technology" (Davenport 1995, p. 1). BPR does not focus on the market offerings of the business, but on "how we *organize* and *conduct* our business" (Hammer 1990, p. 104; emphasis added). In other words, it focuses on redefining "job designs, work flows, control mechanisms and organizational structures […]" (p. 104).

Core competencies have been defined as "the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies" (Prahalad and Hamel 1990, p. 82) and hence fit into our view of capabilities as abilities needed to provide certain market offerings (or in the words of Prahalad and Hamel (1990, p. 83): "products […] are the physical embodiments of core competencies"). However, the organization of these competencies constitutes a strategic decision, as does the question of which competencies are needed. In fact, Prahalad and Hamel (interestingly alluding to military strategy themselves by referring to "battles") propose that building core competencies requires a different organization than the prevalent structuring of the company into strategic business units (SBUs) because "the SBU prism means that only one plane of the global competitive battle, the battle to put competitive products on the shelf today, is visible to top management" (p. 87). This "distortion" leads to "underinvestment in developing core competencies", "imprisoned resources" and "bounded innovation" (pp. 87) and hence hampers the building of core competencies.

Both concepts, BPR and core competencies, highlight the strategic relevance of organizational issues in "structural inertia" (Hannan and Freeman 1984) in the form of either the "inertia of old processes and structures" (Hammer 1990, p. 112) or the "tyranny of the SBU" (Prahalad

and Hamel 1990, p. 86). These inertia are caused by organizational flaws that hamper the creation of the resources and capabilities needed to fulfill the requirements of markets and market offerings. The organization of potentials is hence an important strategic decision for achieving what the company intends, as well.

In both approaches, the organization of resources is viewed as strategic because it determines what the company can in fact do. For example, in multi-business corporations, the way in which resources are organized affects the firm's ability to extract synergies e.g. for the sake of making combined market offerings (e.g. in cross-selling between business units). Synergy between different business units has been argued to be an explicit strategic objective (Ropella 1989) (see also Chapter 1). "Synergy" is also cited as a decision area within business strategy (Collis and Montgomery 1999; Hofer and Schendel 1978; Porter 1987; Prahalad and Hamel 1990). Porter (1987, p. 43) claims that "corporate strategy is what makes the corporate whole add up to more than the sum of its business units", which is the common definition of synergy (Shirley et al. 1976, p. 62: "synergy is best described as the '2+2=5' effect, or alternatively, the 'whole is greater than the sum of its parts'").

While the inclusion of organizational issues in our concept of strategy may seem to counter the general notion of "structure follows strategy" (Chandler 1962), we would like to emphasize that Chandler himself stated that the new market (sic!) strategies of American companies were only possible through the development of organizational capabilities: "organizational capabilities were the collective physical facilities and human skills as they were organized within the enterprise. […] Such organizational capabilities, of course, had to be created and once established, they had to be maintained. […] One of the most critical tasks of top management has always been to maintain these capabilities and to integrate these facilities and skills into a unified organization […]" (Chandler 1990, p. 594). Hence, the intended market decisions are only possible through the (ex-ante) creation of adequate capabilities and resources and their proper organization. In fact, these potentials define the radius of activities (or market offerings) available to the firm: they delineate the company's boundaries (Teece et al. 1997).

For us, the logical conclusion is to integrate the planning and organization of these potentials into our view of strategy, as the planning of potentials actually determines possible market strategies and may explain why market decisions cannot be changed quickly. In the same

vein, zu Knyphausen-Aufseß (1995, p. 93) confirms that "organization does indeed play an important role in relation to questions of strategy."[53]

Governance: Besides the capabilities and resources that are needed to be able to make the intended market decisions, a company also requires a governance system that ensures that the resources and capabilities are built up and used in order to fulfill market requirements and to make the actual market offerings. Governance decisions purposefully design a frame for action. They influence the behavior of stakeholders (i.e. the actions performed in the execution of strategy) e.g. through organizational rights and incentive systems. Hence, these decisions are not the implementation of strategy itself but they steer the implementation. In other words, a company has to ensure that the requisite potentials actually get built and used. For example, a company may decide to merge with another company. The question of governance in this case is how to ensure that managers actually do engage in value-creating mergers even when they might not inherently be willing to do so (e.g. because they run the risk of losing their jobs). If that question is not solved (e.g. by installing "golden parachutes", a measure to provide an incentive to these managers), the potential required for conducting mergers will either never be built or never be applied to execute a merger (zu Knyphausen-Aufseß 1995, p. 91).

In general terms, prerequisites have to be made to reduce the tendency of short-sighted actions potentially motivated by self-interest of stakeholders or other factors. The "structural inertia" mentioned above already hinted at factors that might prevent building or even destroy certain capabilities and resources. This idea is extended by the notion of "strategic liabilities" (Arend 2004). These liabilities represent the "inability of a firm to make a beneficial change resulting from embedded resources and capabilities that were Strategic Assets in an earlier context" (p. 1012). Certain decisions that were originally meant to positively influence firm performance, might bring strategic liabilities with them as a by-product. Hence, maintaining and preserving potentials by avoiding the buildup of strategic liabilities is a strategic purpose as well. Governance decisions are not merely meant to encourage building resources and capabilities, but also discourage the creation of strategic liabilities (encourage desired behavior and discourage undesired behavior).

* * *

[53] Translated by author; originally: "in der Tat [kommen] im Zusammenhang mit Strategiefragen der Organisation eine wichtige Rolle zu".

Decisions that concern any one of these elements of strategy (markets, potentials and governance) can also be argued to fulfill the characteristics of strategic decisions we mentioned in Section 3.2.1, thus providing further backing for their strategic nature.

For example, they all of these elements are intended to influence a company's long-term success. They try to achieve this success by directing subsequent decisions and behavior to be in-line with the company's purpose achieved through market actions and through building the required potentials. They are not the activities that are necessary to act on the market or to build the potentials, but guide these activities with an intention in mind. Each of the decisions is geared towards generating a fit between the intended market decisions and market requirements in the external environment and the potentials inside the company. Decisions on building and organizing potentials have been argued to take time as they are sometimes prone to "inertia". This makes them rather difficult to reverse quickly, an attribute that transfers to the market decisions, which are based on these potentials. As governance decisions shape the behavior of stakeholders, they also cannot be switched easily.

These three elements of strategy help us to evaluate the strategic relevance of IP decisions. They constitute the purposes of strategic IP decisions. An IP decision can therefore be considered strategic according to our view of strategy when its purpose is to influence the market decisions of a company, to build or maintain resources and capabilities required by market decisions or when it serves to steer the company's stakeholders (governance) to build and maintain the required resources and capabilities as well as to make market activities.

4.2 Practical Relevance of Conceptions Found in Research Literature

First, we consider the content and reasoning proposed in literature (Chapter 2) and its practical relevance. We probe the practical relevance of the content of information strategy found in research literature in three steps. First, we check whether the proposals from research are used in practice. To do this, we compare the content and reasoning derived from or proposed in the conceptions of information strategy (Chapter 2) with the content and reasoning elicited from practitioners (Chapter 3). But also if we find matches, we have to argue for why the content is strategic in the sense of our view of strategy. A difference between research and practice indicates that the respective conception from research is not followed by practitioners. However, this does mean that the proposal from research is not intrinsically irrelevant; practitioners might have various reasons for not embracing a proposal from research. For example, they might not be aware of it, their current situation might not warrant its application or there

might be other pragmatic "barriers" that impede the application of the proposal. A proposal from research can only be deemed practically irrelevant if practitioners can argue its general inapplicability.

Second, to determine whether a proposal from research is in fact practically irrelevant, we asked practitioners why they did (not) include the proposals from research in their information strategies. We asked the practitioners interviewed in our empirical study in structured interviews to explain why they did (not) follow the information strategies found in the literature. These structured interviews were conducted after the open interviews presented in Chapter 3. Each lasted around 10 to 20 minutes. These interviews were performed in cases 3, 6, 8, 11 and 12; in the other cases, we briefly discussed some of the questions, but could not complete a full interview due to time constraints.

We started such an interview by asking the practitioner whether he used any kind of literature to aid him in his endeavor to develop an information strategy. If so, we asked for the concrete sources used. We then structured our discussion with the practitioner according to the findings from the literature presented in Chapter 2 (Appendix C presents the interview guide we used). For example, according to the second conception found in practice, we mentioned that research literature would propose to consider the identification of information systems to gain competitive advantage as part of information strategy. We asked whether the practitioners included information systems that change the industry structure (e.g. lower the bargaining power of customers or suppliers) as part of an information strategy to favorably position the company against competitors. If they did, we asked whether they had just forgotten to mention this decision during the open interview. If so, we reinstated the decision as part of the content of information strategy presented in Chapter 3. If they had deliberately excluded the decision and not merely neglected to mention it in the open interview, we asked for their reasons for doing so. In the ensuing discussion, we took the position of a proponent of the respective conception of information strategy, provided that the research articles had sufficiently established the conception's underlying reasoning to defend its relevance (see results of Chapter 2).

These interviews were recorded and transcribed. However, we analyzed these transcribed interviews in a different manner from the open interviews presented in Chapter 3. In this instance, we were only interested in learning whether or not the practitioners followed the proposal from research literature, and if they did not, we asked what their objections were. Hence, in presenting the findings, we will only mention whether practitioners followed the

proposal and summarize their reasons for (not) doing so. For illustrative purposes, we will intersperse the presentation of the results with quotes from the interviews.

Third, in addition to the structured interviews with practitioners, we conducted interviews with three experts on information strategy. The aim of these interviews was to obtain the perspective of more independent individuals acquainted with both practice and academia on potential differences between research findings and practical relevance. For those decisions where we found striking differences between research and practice that could not be easily resolved, we asked experts to get an 'independent' point of view. These experts were chosen especially for their ability to bridge research and practice. On the one hand, they are well-versed in information strategies from their practical experience (as board members of companies or consulting firms with responsibility for information strategy or the information strategy consulting practice, respectively). On the other hand, as former researchers with doctorate degrees (PhD) in information systems, they are familiar with the academic perspective. Table 37 summarizes the qualifications of the experts that led us to choose them for our interviews.

Expert	Qualifications for expert role
1	Member of the Board of a German wholesale company Responsible for IT (CIO) and other business functions PhD in Information Systems Frequent citations in practitioner-oriented IT reports Several research publications on Information Systems related topics Frequent speaker on Information Systems-related academic and practitioner conferences
2	Member of the Board of a German wholesale company Responsible for IT (CIO) and other business functions PhD in Information Systems Several research publications on Information Systems-related topics Listed on IT competence web sites
3	Principal of a world-wide leading management consulting firm, based in New York, USA Global leader of the IT strategy practice of that firm PhD in Information Systems Frequent citations in practitioner-oriented IT reports Several research and practitioner publications on Information Systems-related topics Frequent speaker on IS related practitioner conferences Listed on IT competence web sites

Table 37: Qualifications of experts interviewed

Although it has been used a lot, the technique of expert interviews has received little attention in terms of methodology (Bogner and Menz 2005). We were interested in the experts' reflections on the differences between the practitioners' and literature's information strategy content. Obtaining such a more independent reflection is considered a prime application domain of expert interviews (Meuser and Nagel 2005).

A specific characteristic of expert interviews is that the experts' knowledge is looked upon as being separate from the expert as a person. In contrast to the content provided by the practitioners in our open interviews (Chapter 3), the experts' insights are not understood as an idiosyncratic expression of how they perceive the world as individuals (Meuser and Nagel 2005). Although we did not prevent the experts from using examples from their own companies to illustrate their standpoint, we made it clear to them that we were talking to them as experts and not as representatives of their companies.

The special nature of the knowledge provided by experts impacted how we conducted and analyzed the interviews: we decided that qualitative, semi-structured interviews were appropriate for allowing the experts to share their wisdom (Meuser and Nagel 2005). Our interviews required some structure to ensure that we obtained the experts' opinions on the differences between research and practice regarding information strategy. The questions we asked referred the decisions deemed strategic in research literature (strategic IS, strategic IP resources, information strategy models, functional decisions and the tenor towards IP; see Appendix D for a brief interview guide used to structure the discussion with the experts). For example, assuming that practitioners we interviewed stated that they did not make decisions on IS to gain competitive advantage, we asked the experts why they thought that might be. We then followed this by a discussion of the arguments provided by literature (e.g. MBV and RBV theory) and by practitioners. Beyond that, we did not structure the interview themes any further; we did not want to impose our potentially biased structure on the experts. We wanted to let the experts share their expert knowledge regarding the application and usefulness of theory in practice as well as their thoughts vis-à-vis other practitioners. As stated above, we were not interested in their idiosyncratic situations at their own workplaces other than for illustrative purposes.

Each of the three interviews took between thirty and sixty minutes. They were recorded and then transcribed by the same external company that transcribed the practitioner interviews[54]. The author of the thesis checked the transcription for accuracy. The analysis of the transcription centers on its content rather than on the experts as individuals or the structures they themselves use to interpret the world (Meuser and Nagel 2005). Hence, we did not conduct an intra-case analysis for the expert interviews.

[54] Just as the open practitioner interviews, the transcribed expert interviews were made available electronically to the supervisors of this thesis.

According to the approach described above, the presentation of the results is structured by the conceptions found in literature: for each conception, we first summarize its central notion briefly as a reminder (see Section 2.3 for details). Then we lay out the results about its presence in practice. Based on these findings, we discuss the relevance of the conception. This includes discussing the reasons given by practitioners for following or rejecting the conception, the arguments provided by the experts as well as our own reasoning. Finally, we synthesize the discussion by drawing conclusions for our question, namely whether the proposal from research literature can be considered practically relevant or not.

4.2.1 Conception 1: The use of IT to deliver business strategy

A number of articles in the literature looked at how IT can be used to deliver a given business strategy. The given business strategy is the anchor of information strategy. In fact, information strategy forms part of business strategy. In this conception, information strategy answers the question of how the use of IT can support this given business strategy. The main decision to be made within such an information strategy therefore concerns the selection of IS that support the given business strategy.

4.2.1.1 Presence in practice

In general, our interviewees did not follow this conception: all practitioners perceived information strategy as a strategy in its own right. In no case was information strategy an integral part of business strategy. This position was already indicated through the fact that the information strategies were manifested in separate documents. However, and probably not surprisingly, practitioners linked information strategy to business strategy: as described in Chapter 3, the interviewees referred to certain links to business strategy in order to argue a number of IP decisions as strategic (see Section 3.2.3: Ad 1, Decisions that fulfill or ensure to fulfill requirements of business strategy).

Still, the interviewees deviated from the conception in two aspects: with regards to the decisions that supported business strategy and with regards to the implicit assumption that IP decisions positively support business strategy.

First, when considering the link of IP decisions to business strategy, practitioners did not limit themselves to investments in or uses of IT: while the decisions described in the literature concentrated on IT investments and the use of information systems, practitioners also considered how a number of other IP decisions supported business strategy. It were not merely decisions on the application landscape (decision area a, cases 3, 12), the investment portfolio (decision

area e, case 13), and individual projects (decision area g, cases 6, 13) that were considered to support a chosen business strategy. They also considered decisions on application standards (decision area b, case 5), technology standards (decision area c, cases 8, 10, 12), IT process standards (decision area d, case 12), rights and accountabilities (decision area j, cases 6a, 7, 8), sourcing (decision area k, case 10) as well as those on IT security and continuity (decision area l, case 11) to be related to business strategy. Hence, practitioners have a broader view of information strategy content than implied by this conception.

Second, practitioners went beyond the intuitively supporting relations between information strategy and business strategy. The first conception identified in literature assumes that IP decisions have to support the chosen business strategy. A supportive relation between IP and business strategy seems to be broadly assumed in information strategy literature[55]. In line with this, one of the interviewees' concerns was to avoid making a decision that worked against the chosen business strategy. For example, if the strategy was aimed at growth or emphasized a short time-to-market, the rights and accountabilities for IT decisions were decentralized with the intention to give more freedom to business units and not to hamper their growth. When cost containment was the focus of the business strategy, decision rights were centralized, with the expectation that this would help to contain IP costs. Or if the current application landscape hampered the targeted growth, it had to be redesigned to enable the growth strategy.

However, some of the relations between IP decisions and business strategy expressed by practitioners were also more counter-intuitive: certain IP decisions were not focused on how to support a given business strategy, but deliberately strove to counter-balance it (Table 38 presents examples for this different logic).

Case	Quote	Summary
3	10: wir waren natürlich an vielen Stellen sehr stark getrieben von der Unternehmensstrategie […] 90: die Anwendung ist im Wesentlichen die Schnittstelle gewesen zur Unternehmensstrategie und zu den Anwendern. Die Frage der Technologie war […] durch ganz andere Parameter getrieben. 96: Die waren schon strategisch in Ihrer… aber rein IT strategisch getrieben, also IT […] getrieben.	Two parts of an information strategy: IP decisions concerned with business strategy and IP decisions that are strategic for other reasons

[55] For example, in the Strategic Alignment Model (Henderson and Venkatraman 1993, pp. 9), all "four dominant alignment perspectives" assume a directly positive relationship by demanding that information strategy "support[s] the chosen business strategy" ("strategy execution" perspective), "best support[s] the chosen business strategy" ("technology transformation" perspective), seeks out the "best set of strategic options for business strategy" ("competitive potential" perspective) or makes "the internal service business succeed" ("service level" perspective).

6	117: wenn wir nur business-driven wären, dann würden wir über kurz oder lang nicht mehr kosteneffektiv sein 334: weil wir eben diese business-driven-Strategie rausgegeben haben und jetzt meint das Business scheinbar, wir arbeiten nur noch für Business. Das ist eine kleine Gegenkorrektur 350: [was ich] also auch strategisch ansehe, das hat aber gar nichts mit business-driven IT-Strategien zu tun, sondern das ist IT-driven […], um jetzt wieder zurück zu kommen, auf einen normalen […] Level und dann wieder kosteneffektiv oder ressourceneffektiv zu bleiben	Not solely "business [strategy] driven", but also IT-driven; information strategy has to include counter-balances; these counter-balances have to ensure a sustainable cost containment

Table 38: Awareness of the need for an information strategy beyond supporting business strategy

Here, practitioners expressed the need to deliberately dis-align from the business strategy and from merely fulfilling the requirements to execute it. This logic suggests that information strategy is also configured to fulfill needs that go beyond supporting current business strategy.

While the practitioners did not dispute that information strategy has to support business strategy execution, they complemented this positive relation between the two strategies with a deliberate dis-alignment. In the next section, we discuss these different points of view.

4.2.1.2 Discussion

We find a number of explanations for practitioners not following the first conception found in research literature.

A potential explanation might be grounded in our sample. We chose to interview practitioners who deal with information strategy development as one of their core tasks and who can be viewed as "evangelists" of information strategy. These practitioners might have a vested interest in viewing information strategy as a separate entity because large parts of their job depend on it.

The practitioners themselves offered different reasons (see Table 39). They argued that their companies had no explicit business strategy (case 6), changed the strategy in an opportunistic way (case 6), or did not share it with the IT planners (case 8). In these cases, the business strategy was described as unclear. If there is no articulated business strategy, or if it is simply not shared with information strategy planners, then information strategy can neither be part of business strategy nor is there something that dictates what to align against.

Case	Quote	Summary
4	Sustainability […] stellt aber sicher, dass sich Effektivität oder Effizienz nicht in kurzfristigen Dingen erschöpfen, sondern langfristig wirksam sein können. Architektur stellt dies Sustainability sicher, die oft auch von den Business Areas nicht in gewünschtem Maße eingespielt wird. […] Klar, die wollen es in den ersten 2 Jahren alles haben, was ich verstehe. Aber da müssen wir halt auch mal eine Gegenperspektive anbringen, deshalb definieren wir hier Architektur Architekturen sind absolut strategisch, die entscheiden darüber, ob man liefer-	Certain decisions (e.g. on architecture) have to take a longer-term perspective and focus on more generic abilities (e.g. the ability to deliver IP services)

	fähig ist oder nicht lieferfähig ist [als IT Abteilung]	
6	man müsste eigentlich meinen, da gibt's ne festgeschriebene Geschäftsstrategie, so auf 3-5 Jahre, auch das würd ich jetzt mal sagen, ist wahrscheinlich in der Theorie wünschenswert, in der Praxis findet das einfach nicht statt. Es kommt noch mal dazu, dass die [company]-Bank an und für sich sehr opportunistisch handelt. Also dort wo sich Chancen auftun, da werden die wenn möglich wahrgenommen. [...] Das ist so der Grundsatz der Geschäftsstrategie und das macht für uns jetzt in der IT natürlich nicht einfacher, weil wir immer wieder von neuen dann raus finden müssen, wo dann die Schwerpunkte liegen.	There is no stable business strategy; IT hence has to remain flexible
8	Und grundsätzlich, je volatiler ein Sektor ist, eine Industrie ist und je volatiler dann auch ein Unternehmen ist, desto volatiler wird die IT-Strategie. Das ging bis dahin, dass man einfach auch opportunistisch war […] dann ordnet sich da halt auch die IT unter […]	The more volatile a company's environment and own strategy are, the more volatile the information strategy
8	[...] also der IT gelingt es immer nie, das Business festzulegen [...] Business Units. Wir können von der IT jetzt nicht hingehen zu einem Head of Business und sagen: So, gib mir jetzt mal Deine Strategie für die nächsten fünf Jahre. Und im nächsten Jahr wiederkommen und sagen: So, gib mir ein Update. Das geht nicht.[...] dann sagt er: Ich weiß es nicht, ich weiß nicht, wie sich der Markt entwickelt, wir sind noch nicht durch und drittens habe ich es noch nicht mit meinem Chef besprochen und viertens geht's Dich gar nichts an.[...]	Business units either do not have a business strategy or do not want to share it with IT planners

Table 39: Reasons for separating information strategy from business strategy

A further interpretation of the 'deliberate dis-alignment' of information strategy with business strategy is based on the expressed need for 'counter-balancing' the short-sightedness of business units described in case 4 (see Table 39): while business units may focus on the firm's market offerings and on those resources and capabilities immediately needed to make these market offerings (and thereby proclaim market strategy as the only part of 'business strategy'), information strategy has to also ensure that generic, longer-term capabilities are preserved. The interviewee in case 4 (see Table 39) mentioned that architectural decisions help to maintain the ability to deliver IP services which determines the company's overall ability to act via the use of IP (cf. Section 4.1). If these decisions were not made, future market strategies based on IP might be compromised. In other words, certain decisions supporting current market requirements might represent strategic liabilities for future (possibly unknown) market strategies (see the discussion of strategic liabilities in Section 4.1). Hence, information strategy planners need to do more than merely support current market offerings. They also have to be wary of the creation of IP-based strategic liabilities by these initiatives, such as increased complexity of the IT infrastructure (see the reasoning presented in Section 3.2.3, Ad 5: Decisions that help to avoid or mitigate IP complexity).

A further backing of this argument is found in the "alignment paradox" (Tallon and Kraemer 2002). The "alignment paradox" asserts that "strategic alignment may lead to greater payoffs from IT, but [… only] up to a certain critical level […] Beyond this point, further strategic alignment in fact leads to a decline in IT payoffs" (Tallon and Kraemer, p. 19). An overly

rigid alignment with a given business strategy may hamper the flexibility of the business to implement changes. The strategic need for flexibility is also supported by recent literature emphasizing IP's role in a company's agility (Oosterhout et al. 2006). It is also reflected in practitioners' reasoning presented in Section 3.2.3, Ad 4: Decisions that affect the company's flexibility).

Hence, we interpret deliberate dis-alignment as evidence of practitioners' cognizance of the dangers of overly rigid support for alignment with a given market strategy. Independent of any current market strategy, an information strategy has to maintain the company's ability act on the basis of IP and its flexibility; this ability is threatened if strategic alignment is too rigid and if the side effects of strategic business initiatives on IP go unchecked. As we have defined strategy to also encompass generic capabilities, we are not really talking about a dis-alignment with business strategy, but rather with current business strategy. In that sense, practitioners argue that strategic IP decisions involve a trade-off between the optimal support of current market strategy and strategic potentials (especially generic capabilities such as flexibility and the ability to act on the basis of IP).

Discussing the identified differences between research and practice with the experts, we found some discordance. The first expert took a pragmatic point of view and agreed with the practitioners that there are practical reasons that preclude the full integration of information strategy into the business strategy. Beyond the reasons stated by practitioners above, he mentioned the pressure from external auditors asking for an explicit information strategy:

> 120: […] getriggert durch Wirtschaftsprüfer, wird ja auch in IT-Prüfungen, […] darauf hingewiesen […] dass es] eine explizite IT-Strategie [geben muss] (expert 1)[56]

The expert also confirmed that the complete alignment of all IP decisions with business strategy might not always be a good idea:

> "258: Teilweise müssen Entscheidungen getroffen werden, die […] überhaupt nicht in line mit der Geschäftsstrategie sind oder mit bestimmten Zielen, die man sich aufs Geschäftsseite gesetzt hat, einfach weil ich sozusagen auf der IT ja ein Stück weit anders denken muss und im Endeffekt langfristiger denken muss im Sinne von der Entwicklung der IT-Architektur" (expert 1)[57]

[56] Translation by author: "120: Often triggered by auditors, also in IT audits [… companies] are instructed to have an explicit IT strategy." (expert 1)

[57] Translation by author: 258: "Sometimes decisions have to be made, which […] are not at all in line with the business strategy or with certain aims you've set yourself on the business side, simply because in the field of IT you have to think somewhat different and at the end of the day more the long term in terms of the development of IT architecture" (expert 1)

> "276: ich muss an der Stelle sehr langfristig denken, denn wenn ich das nicht tue […] dann muss ich im Prinzip zu einem späteren Zeitpunkt vermutlich mehr Geld in die Hand nehmen oder irgendeine Entscheidung treffen, die ich heute eigentlich schon absehen kann, dass sie dann schmerzhaft wird [...] Das muss ich im Prinzip möglichst langfristig vordenken. Und ich muss im Prinzip ja auch die Entwicklung vorweg nehmen." (expert 1)[58]

The second expert argued that ideally, information strategy would not be about IP, but solely about business, hinting at the convergence of information strategy and business strategy:

> 771: Und das zeigt eben auch, dass da immer noch nicht klar, es geht nicht um IT, es geht darum, wie machen wir unser Business. (expert 2)[59]

This view is also held by some researchers, who state that "the most successful approach we have seen is where there are no IT strategies, only business strategies" (Earl and Feeny 1994).

4.2.1.3 Results and insights

Several conclusions can be drawn from these findings: first, one has to be very clear on what is meant when referring to "business strategy" and the relation between information strategy and business strategy. This is not always the case in articles following the first conception of information strategy (especially when vaguely defining strategy as all kinds of objectives (see Chapter 2)). When referring to a company's market strategy (i.e. its choices of markets and market offerings, etc. (see Section 4.1)), the support of market strategy is viewed a main purpose of information strategy in practice and research. When making an IP decision, decision-makers apparently do consider how this decision can support or enable market strategy.

However, secondly, we find the reasoning of practitioners (and the first expert) convincing that supporting a given market strategy is not the only aspect to take into account. Trade-offs between the best support of current market strategy through IP on the one hand and even longer-term potentials such as generic capabilities (e.g. the company's overall flexibility or agility as well as the ability to act on the basis of IP) on the other hand have to be considered, as well. For example, not considering the complexity of the IT architecture might risk the company's ability to support future market strategies. These trade-offs can be viewed as a deliberate dis-alignment between market strategy and longer-term generic capabilities. However, these capabilities also form part of our understanding of strategic purposes (see Section

[58] Translation by author: "276: I have to think very much in the long term at this point, because if I don´t do this […] I probably have to spend a lot more money at a later point in time or make a decision about which I already know today that it will be painful […] So basically I have to think that through in advance. And basically I have to anticipate the development." (expert 1)

[59] Translation by author: "And that simply shows that it is still not clear: it [information strategy] is not about IT, it is about how we conduct our business." (expert 2)

4.1). Thus, deliberate dis-alignment still seeks for improving long-term firm-performance, but through "global" optimization (i.e. by taking into account the whole spectrum of strategic purposes beyond current market strategy) rather than through local optimization of a given market strategy. This "global" optimization may necessitate a sub-optimal support of current market strategy for some time.

For these reasons, it is not only impractical (due to the mentioned, mostly pragmatic barriers such as an undefined business strategy) but also misleading to fully integrate market strategy and information strategy. We propose to keep information strategy and market strategy as separate but related entities. One (important) relation is the support of market strategy. Thus, in terms of decisions that are part of information strategy, we also agree that those proposed by research, namely the selection of information systems, are strategic IP decisions if they support market strategy execution. However, other decisions may support market strategy, as well. Others counter market strategy in favor of emphasizing potentials (e.g. through introducing certain governance decisions that discourage IP decisions that might harm generic capabilities such as flexibility). Which ones these are will be discussed in Section 4.3 when we turn to the decisions proposed by practitioners.

4.2.2 Conception 2: The use of IT to gain competitive advantage

As discussed in Chapter 2, many IS research efforts have been dedicated to understanding IP's role in gaining and sustaining competitive advantage. The anchor of information strategy following the second conception is a competitive theory (foremost the MBV and RBV). The question answered by an information strategy is how the use of IT can help to gain and sustain competitive advantage. Accordingly, its content focuses on decisions on strategic IS (SIS) aiming at competitive advantage or on other IP resources that qualify as strategic resources by virtue of being rare, inimitable, valuable, etc.

Wilson (1989) reported that competitive advantage was considered in practitioners' information strategies (see Chapter 3).

4.2.2.1 Presence in practice

In our sample, almost none of the IP decisions included in our interviewees' information strategies were related to competitive advantage. There were few instances of competition being taken into account at all: in the use of standard software as a potential disabler for pursuing a competitive strategy based on differentiation (decision area b, case 5; see Section 3.2.3, Ad 1) and in decisions supporting the cost competitiveness of the company (e.g. deci-

sion area d, case 11, see Section 3.2.3, Ad 3). Hence, in contrast to the literature, the focus of the interviewees who considered competition at all was less on generating positive effects (competitive advantage) but more on avoiding negative effects (reducing competitive disadvantage to stay at competitive parity). In the latter cases, IP was not looked upon as a source of competitive advantage (i.e. as a "competitive weapon", "strategic asset" or "strategic resource") but as a competitive burden e.g. due to its high cost or to the difficulty of reversing IP decisions.

4.2.2.2 Discussion

An explanation for the striking difference between and our sample and the conception in research literature as well as in comparison to earlier surveys (Wilson 1989) might be that using IT to gain competitive advantage was "hyped" in the 1980s and early 1990s, but that practitioners now look "beyond competitive advantage" (Galliers 1993a). While this explanation would appear to lower the significance of competitive advantage for information strategy, it certainly does not argue for the complete irrelevance of competitive reasoning in practice. In the interviews, practitioners cited other reasons for diverging from the conception (Table 40). On the one hand, there are practical barriers that keep practitioners from applying the reasoning around competitive advantage. On the other hand, practitioners argued that the logic of gaining competitive advantage was not always applicable to their situation.

Barriers to adoption

Some interviewees claimed that they could not apply competition-oriented reasoning as part of their information strategy even if they wanted to (cases 3, 11, 12); they were either not encouraged to think about competitive issues or that they lacked credibility among their peers (business unit executives); they also felt unwilling to devote time to thinking about competitive advantage because there was simply no incentive to do so.

Barrier 1: Distraction and diversion

The CIO in case 3 reported that the climate within the company impeded him from looking beyond providing cost-efficient service to business units. He was charged with all strategic IP decisions as well as with all operational decisions related to running the IT unit. Because he feared that the IT unit would be dissolved if it became too expensive, the CIO concentrated his efforts on cost containment and on delivering IT services that were not too expensive. Hence, there was little time to devote to other topics. This also meant that IT unit staff members focused on the efficiency of their current tasks rather than exploring new technologies

and their competitive uses. Hence, IT staff was not selected or trained for discussing competitive impacts of IT with business unit staff. Eventually, the IT unit's employees lost the ability to think in terms of IT and its competitive use for business (see Table 40).

Barrier 2: Lack of credibility

In cases 12 and 13, the IT executives argued that they were not accepted as strategic thought partners in their companies. They claimed to have no credibility because their IT units had not performed well on an operational level in the past. In case 12, business managers told the CIO that he "had to get [his] business under control before talking about changing [their] business." Hence, the IT executive was "not allowed" to talk about IT-based process improvements or the innovative and competitive uses of IT before he had brought IP back under control. The interviewees in these cases principally argued that if a lack of control over IP or substandard performance of the IT unit were perceived, the competitive use of IT was unlikely to feature on information strategy agendas. In support of this, Lucas and Turner (1982) propose that if a company has no control over IP, "it may be depriving itself of the opportunity to gain a major competitive advantage through the creative use of technology" because "effective control of information processing is a necessary prerequisite to the integration of technology with strategy. If information processing is viewed as a failure [out of control], managers will refuse to rely on it for a major role in the formation and execution of corporate strategy" (see Chapter 2, conception 3). A similar argument is found in (McNurlin and Sprague 2006), who cite a consultant.

The 'distraction barrier' described above illustrates that preoccupation with controlling the costs and overall success of IP service delivery tends to distract the planner from adopting a competition- and innovation-oriented perspective on information strategy. At the same time, the 'credibility barrier' suggests that paying too little attention to IP cost and service delivery will have the same effect. One can conclude that only an adequate level of attention to these issues might not hamper the competitive perspective. What this 'adequate' level is, remains unresolved so far.

Barrier 3: Lack of incentives

Yet another barrier to following the logic of competitive advantage was described in cases 8 and 11. According to the interviewees, stakeholders were simply not willing to spend time thinking about how IT could be used to benefit the business. In case 8, the pricing model for IT services was set up such that the introduction of new technologies would have increased service charges. This made introducing new technologies unattractive or even unaffordable

for the business units (see Table 40). Hence, neither the business units nor the IT unit seriously considered making these kinds of decisions. The interviewee in case 11 reported that his company was innovative enough even though IT-based innovations happened only by chance, i.e. without any prior planning. His argument was that things worked "well enough" without planning.

Applicability of conception

In addition to citing the various barriers that kept their companies from following the conception, practitioners also argued that competitive-oriented reasoning was not really relevant to them. Some clearly did not perceive IT as serving a strategic role (e.g. in case 13 (ceramics producer): "we don't want to be pioneers in IT"; in case 9 (logistics company), we were told that "here at <company-name>, IT is a tool". Case 4 was a public institution and was hence not concerned with competition. These companies did not see any reason to apply the logic of competitive theories.

However, no practitioner disputed the idea of IT being relevant to gaining and sustaining a competitive impact. The interviewees did not object to the overall possibility of gaining competitive advantage with IT.

* * *

The experts confirmed that certain barriers prevent companies from looking at the competitive impact of IT. The credibility barrier in particular was supported from their experience:

> "22: Die Theorie impliziert immer, dass man auf einem sehr guten Stand ist oder auf einem Stand, wo man seine Probleme gelöst hat. Und der Zustand der Informationssysteme in Unternehmen ist eher dergestalt, dass sie zunächst mal Probleme zu lösen haben. Das heißt, sie kommen gar nicht auf den Gedanken zunächst mal, an Wettbewerbsvorteile zu denken, weil sie erst mal sehen, dass es überhaupt funktioniert" (expert 2)[60]

In addition to confirming the barriers mentioned above, the experts discussed the capabilities of those charged with developing an information strategy:

> "372: Kompetenz insbesondere auf den Ebenen, wo sie eigentlich erforderlich wäre, gar nicht vorhanden ist […] also auf Vorstandsebene ist sie definitiv nicht vorhanden […] und

[60] Translation by author: "22: Theory always implies that you have a very good position or being at a point where you have solved all problems. The state of information systems in companies however is that they first of all have to solve problems. That means they don't even get the idea of thinking in terms of competitive advantage, because to begin with they have to make sure everything is working." (expert 2);

zwar ich glaube nicht nur, dass da IT-Kompetenz nicht da ist, ich glaube insgesamt, dass Fachkompetenz per se da unterausgeprägt ist" (expert 2).[61]

"30: And most people haven't cracked the code of how one can systematically use technology competitively. For the most part, it has been fortuitous happenstance and not a real part of strategy" (expert 3).

The last quote also underscores at the difficulty of planning the effective, systematic use of information systems to gain competitive advantage and to ensure their incorporation into an information strategy. One explanation the experts gave for this is that it is not one decision (or 'strategic initiative') in particular that leads to competitive advantage but many small details that work together in a complex way. However this "working together" is difficult to predict:

"62: es ist die Perspektive dessen, was ein Wettbewerbsvorteil ist [… in der Literatur] immer geprägt davon, dass Sie Dinge tun können, die andere nicht tun können und dass das ein Wettbewerbsvorteil ist. Und so gravierend ist der Unterschied durch IT dann nicht. Das heißt aber nicht, dass es nicht einen strategischen Wettbewerbsvorteil gibt. Der ergibt sich aber zum Beispiel in unserem Geschäft, im Handel, durch die Summe an Details […][alle glauben,], dass es diesen Rieseneffekt geben muss. Und dass die Summe der Details einen Wettbewerbsvorteil macht, daran denkt keiner." (expert 2)[62]

As a consequence of the complex interaction between IT and competitive advantage as well as the planners' inability to predict how it will unfold, decisions aimed at gaining a competitive advantage through IT are hard to justify:

"852: [wenn ich eine Entscheidung treffe] dann muss ich ja irgendeinen Grund haben, das zu tun. [Wenn dieser Grund in der Erreichung von Wettbewerbsvorteilen läge,] dann müsste ich ja wirklich auch irgendwann mal einen quantifizierbaren Wettbewerbsvorteil daraus generieren. […] Ich meine, da müsste ich mal fragen, wo ist der quantifizierbare Vorteil? Denn den kann mir keiner nennen […]" (expert 1)[63]

Overall, the combination of the difficulty to know how a competitive advantage is gained, the difficulty to plan it up front and to measure and hence justify it, paired with a potential lack of competence on the planning level all work against the inclusion of competitive advantage on the information strategy agenda in practice.

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[61] Translation by author: "372: Competence particularly doesn't exist on the levels where it is needed, […] on board level there is definitely no competence […] and I don't only think that there is nobody with IT expertise, but in general functional [business] competence itself is suboptimal on that level" (expert 2).

[62] Translation by author: "62: it depends on the perspective of what is a competitive advantage […in literature] it [the perspective] always involves that you can do things that can't and that this is a competitive advantage. But the difference IT makes is not that big in the end. But that does not mean that there is no strategic competitive advantage. But that advantage, for example in our business, retail, is a results of the sum of details […] [everybody believes] that there has to be a huge effect. But nobody realizes that the sum of all details makes up the competitive advantage." (expert 2)

[63] Translation by author: "852: [When I make a decision] I have to have some kind of reason to do so. [If this reason was achiving competitive advantage,] I would have to get a quantifiable competitive advantage at some point. […] What I want to say is: I would have to ask, where is my quantifiable competitive adavantage? But nobody can pinpoint it […]" (expert 1)

Regarding the applicability of the overall logic of competitive theory, the experts confirmed that a company's attitude towards IT influences whether the competitive use of IT is considered at all. They stressed that in most situations, IT is not perceived as a source of competitive advantage:

> "29: For the most part, technology just plays a very supporting role […] the fact of the matter is that most traditional IT shops are typically run as cost centers. Most of the IT strategy work is mostly offshoring and outsourcing to ensure keeping costs down" (expert 3).

The experts suggested that this trend may stem from companies' previously (negative) experience in their attempts to use IT in endeavors targeting competitive advantage.

> "385: da haben wir uns eine blutige Nase geholt." "878: Der Kostenvorteil, den wir gehabt haben, ist ruckzuck wieder von den anderen aufgeholt worden" (expert 1, using an example from his own company to stress the point in general)[64]
>
> "25: the current practice of technology, hasn't caught up with the expectations of technology"; "34: So the practitioners seem to be a little bit more conservative, given their experience" (expert 3)

While this explains why companies do not apply the logic, the experts also argued that the application of competitive theory might simply not be warranted at all in a number of situations. The first expert firmly rejected the notion that IT plays any role in gaining and sustaining competitive advantage.

> 295: "Also ich halte das für Nonsens oder ziemlichen Nonsens, dass IT wirklich eine Möglichkeit bietet, Wettbewerbsvorteile zu erarbeiten. [Das] ist Unfug"; 313: "[Ich bin] heutzutage nicht mehr der Ansicht, dass man IT-Strategie im Sinne von Wettbewerbsvorteile erarbeiten sehen kann"[65]

Experts 2 and 3 stated that the question is "not if the theory of IT and competitive advantage is right or not, but when should it actually be applied, when should they actually think about it" (expert 3). They thus hinted at situational factors that affect the incentive for companies to seek competitive advantage. The consideration of innovation and competitive advantage might only be required if a company is being attacked or wants to attack incumbent companies. The principle argument was that using IT competitively is a risky and costly undertaking. Hence, a company would only apply this thinking when it really needs to do so. If a company is not in a situation that requires competitive action, innovating or using IT competi-

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[64] Translation by author: "385: we got ourselves a bloody nose there." "878: The cost advantage we had was in no time made up by the others" (expert 1)

[65] Translation by author: "295: Well, in my opinion it's nonsense or pretty much nonsense to say that IT provides an opportunity to achieve competitive advantage. [That] is rubbish";"313: [I am] not convinced any more that you can view IT strategy in the sense of generating competitive advantage."

tively was suggested to be too risky and too costly. The experts implied that situations warranting the competitive use of IT might be less frequent than is assumed in research:

> "107: [The question is] are you performing well with respect to competition or are you ahead of the competition? […] very often, one falls into the trap of making the assumption that by definition innovation is a good thing. Innovation is not always a good thing. […] If there was no competitive threat, there was no new business model which threatens their existence, it would not innovate. They don't have to innovate because innovation is expensive, it's risky. It actually cannibalizes your own business. [...] unless there is an attacker who play in that stage, the incumbent does not have an incentive to innovate" (expert 3)

> "82: And you'll think more of that in, you know, not in the incumbents […] who have frankly no incentive to innovate. There is absolutely no reason why the incumbent should innovate. The innovations are risky and very expensive and the only reason why you would do that is if you were attacked by an attacker [...] there is absolutely no reason to introduce a new online channel and to introduce a new online bank [...] and then the brick-and-mortar people have to put some money in it. But as a rule, the incumbent has no incentive to innovate" (expert 3)

> "136: there are a few myths around technology's strategy. One of those myths is this that technology innovation is always good. I think technology or the usage of technology for competitive advantage, it's going to happen depending on the business context, right? So you're not going to see an incumbent who is doing very well trying to get too innovative and creative about anything. [...] It's only when the incumbent is either attacked by an attacker or their performance is not keeping up with the other competitors. That's when they're going to say: I need to use technology somehow to give me at better cost advantage, more revenues or whatever. An attacker is more likely to use technology for competitive advantage than an incumbent." (expert 3)

4.2.2.3 Results and insights

In summary, decisions on competitive and innovative uses of IT were argued to be unlikely to feature on the information strategy agenda if IT's role was not regarded as strategic or if certain barriers precluded its consideration as such. There might also be situations in which the logic of gaining competitive advantage with IT may not be applicable.

However, neither practitioners nor experts presented convincing arguments for not thinking about IT and competitive advantage at all. Hence, the question is *when* this thinking should be applied. Depending on how many situations really warrant expecting a competitive advantage from IT, the question is whether researchers are well advised in concentrating their efforts on IT and competitive advantage given the potentially low applicability in practice. While this question is beyond the scope of this thesis, further research on situational factors that support the application of competitive logic seems worthwhile.

Gaining competitive advantage fits our view of strategic purposes introduced in Section 4.1. Both competitive theories, the MBV and the RBV, emphasize gaining and sustaining an ad-

vantage vis-à-vis competitors, i.e. other companies making comparable market offerings. Hence, both theories look at long-term firm performance through distinguished activities on the market. However, while the MBV takes the outside-in perspective (starting from the choice of a favorable position within the market and then asking which potentials have to be built in order to take and defend this position), the RBV takes the inside-out perspective (starting from potentials that exhibit certain characteristics and then looking at how these can be used to conduct favorable market activities; the latter is implicitly included in the demand characteristic of 'being valuable')[66].

The conclusion for us is that IP decisions proposed in literature that aim at gaining and sustaining competitive advantage (and at avoiding disadvantage) are strategic, even though this logic may be applicable only in certain situations. There is no consensus in research yet, on how this advantage can actually be achieved (see Chapter 3, conception 2).

What also became clear from the various barriers expressed by practitioners and confirmed by experts is that if a company intends to use IT for competitive advantage, the it seems crucial to design the appropriate governance system (e.g. incentives) so that stakeholders are allowed, able and willing to make competition-relevant IP decisions.

[66] Compare the discussion of the MBV and RBV in Chapter 3, conception 2; as well as Footnote 50: in our understanding, besides resources that promise being a source of competitive advantage, we also consider those resources as strategic that are competitively necessary because they are required for market activities

Case	Quote	Summary
3	[…] der Vorstand hat ja gemerkt, dass er von einer gewissen Abhängigkeit getrieben war. […] von der IT [unit] […] Was hätten die denn entscheiden sollen? Die müssen uns doch glauben. Wir sind so cost-efficient, dass ihr an keinen anderen Dienstleister gehen wollt oder gehen könnt […] D.h. immer diese competitive situation zwischen internem und externem Dienstleister […] so dass der Kostenhebel für uns [IT Unit] auch irgendwie ein survival Hebel war." "Was dabei völlig runtergefallen ist [...] wir waren dann irgendwann auch nicht mehr Innovationsstark, Innovation war nur noch aus dem Projekt heraus getrieben. [...] Die IT Leute hatten auch gar keinen Blick mehr für sowas [...] mal aus den normal day-to-day operations raus an was Neues denken" "Weil wir immer die Angst hatten, dass wenn wir Projekte an Externe verlieren, wir den ersten Schritt in die Auflösung [...] der Abteilung machen würden"	All IT decisions (operational and strategic) resided in the IT unit The pressure to deliver cost-efficient IT services to business units hampered thinking about innovative uses of IT
8	Also es gibt irgendwo verzerrende Preise, das ist ein interessantes Phänomen, [...] einige Services billiger sind als andere, obwohl das dann Innovationen behindert. […] Und wenn ich jetzt ein neues innovatives System machen würde, was mich irgendwo […] weiterbringen würde, dann müssten die erst mal viel zahlen, viel mehr als fürs alte System. Entsprechend haben die kein Interesse daran	Charging mechanisms incentivized sticking with old technologies rather than adopting and using innovative technologies
11	53: Das hat was mit unserer dezentralen Philosophie zu tun, also auch in den Business Units sind wir dann auch wieder dezentral organisiert, das heißt, solche innovativen Ideen kommen dann aus den Prozessen, aus den Geschäftseinheiten und entstehen dann, sage ich mal […] zufällig 323: Also es funktioniert, wir sind hoch innovativ [obwohl wir nicht] eben systematisch nach solchen Themen zu suchen 319: Deswegen ist, glaube ich, im Moment gar kein Bedarf 321: wobei man eben manchmal vielleicht noch mal gucken müsste, was wirklich die Vor- und die Nachteile wären, wenn man so was machen würde 487: Die Frage ist ja, was ist in so einer Welt wirklich die Rolle so einer IT-Organisation. Weil letztlich sorgen sie dafür, dass die Projekte, die aus dem Business kommen, umgesetzt werden. Das ist deren Hauptaufgabe. Und dass sie danach, wenn sie eine Applikation ist, vernünftig betrieben wird. Gut, das ist eine klare, verständliche Aufgabe. Aber erwarten, dass die mithelfen, zu überlegen, was sind denn die richtigen Projekte, das erwartet kaum einer. […] Deswegen ist es sehr schwer, im Sinne einer Top-Down-Strategie und einer langfristigen Vorgabe eine Strategie zu machen, wie gesagt, die über das Portfolio hinausgeht." 625: In einer idealen Welt, glaube ich, hätte man einen Prozess, der IT und Business so früh zusammenbringt, dass man technologisches Potenzial erkennen kann und sich für seine Businessanforderungen, für seinen Wettbewerbsvorteil letztlich, bereitstellt. Das wäre, glaube ich, die ideale Welt. Das wäre der eine Part der IT-Strategie. […] Aber der erste Teil, das ist da, [wo es] schon noch einfach aus dem Bauch raus hohes Verbesserungspotenzial gibt. Ohne das jetzt benennen zu können. Wie gesagt, man sieht eben, bei [company] zumindest funktioniert es gut. Die Frage ist, wie viel besser könnte es funktionieren, wenn es anders wäre?	There is no need for looking for innovation through IT The view towards those who are responsible for IT planning (and who understand IT) is that IT is a deliverer rather than a strategic partner
12	794: Underdog position […] war so, definitive […] es war kurz vor einem Outsourcing, sage ich mal, aus […] Kostengründen. […] Wir waren […] sehr wenig akzeptiert. 806: dadurch, dass wir […] eine engere Dienstleisterrolle aufgenommen haben […] Sie müssen erst mal Kostenoptimierung errei-	IT was well regarded because it was too costly. Hence, the focus had to be on

	chen, um dann als strategischer Partner akzeptiert zu werden. Also eine IT, die viel zu viel kostet, die kann so viel Strategie machen, aus meiner Sicht, wie sie will, die wird man nicht ernst nehmen. 815: In erster Linie muss man Kostenmanagement machen, das Kostenmanagement muss Akzeptanz finden, Gehör finden, dass man sagt: Oh kuck, da beherrscht jemand sein Thema. Und dann können Sie über ein sauberes Kostenmanagement auch im Sinne von funktionalen Benefits, Unterstützungsleistungen, Prozessunterstützung diese Dinge positionieren.	managing the cost of IT because if IT costs too much, it has no credibility as a strategic partner.

Table 40: Explanations for omitting competitive advantage in information strategy

4.2.3 Conception 3: A plan for the whole IP domain

A large number of articles conceive of information strategy as a plan for all kinds of IP elements that together constitute the IP domain (see Chapter 2). Decisions on these various IP elements were more or less well structured into decision areas. The conception was rather weak with regards to reasoning: the articles we counted as utilizing this conception had in common that they listed a number of decision areas or used common sense or analogy to present an up-front structure and derived decision areas from this logic. Hence, we only used this conception to check whether practitioners used a similar structure and what the logic behind these structures was.

4.2.3.1 Presence in practice

The decisions mentioned by the interviewees can be mapped to the decision areas found in the lists or in one of the models presented in the literature. For example, we could map the 12 decision areas (a-l) we identified in practice to Earl's categories of IS, IT, and IM. However, the practitioners did not use these exact lists or models. Those who communicated their own models of information strategy (cases 2, 4, and 7) used idiosyncratic structures (Table 41).

Case	Quote	Summary
2	76: Im Grunde genommen beschäftigt man sich in der IT [Strategie] oder sollte man sich beschäftigen und haben wir eben deshalb auch getan immer mit der Frage: A) wie steuern wir uns und wie werden wir gesteuert und B) ja was ist eigentlich die richtige Anwendungslandschaft, wie wollen wir sie entwickeln, steuern?	Information strategy consists of two elements: governing the IT unit and the application landscape
4	17: Für uns hat IS Strategie immer letztlich diese 8 Aspekte, die hier aufgeführt sind […] Letztlich kommt es alles dann mal raus auf eine Mission und Vision. […] Das Zweite steht auch noch am Anfang, kommt auch am Ende letztlich, ist Culture, Values and Communication […] Eigentlich sind die beiden oberen eher auf der Soft-Seite und dann geht's mit der harten Seite los. Markt und das sind für uns Kunden und Produkte. Es ist nicht so sehr die dritte Dimension, die da oft genannt wird, die Vertriebswege. Vertriebswege spielt für uns nicht so eine Rolle. Vom Markt in die Produktstrukturen, ich übersetze sozusagen das, was der Kunde sieht, in die komplexen Produktstrukturen, die wir nach innen haben. Da ist jetzt das Thema Architektur […] Produktstrukturen, die dahinter liegen, die natürlich für den Kunden als Ganzes gar nicht sichtbar sind, sondern das ist alles intern. Von den Produktstrukturen geht es dann in die Delivery Organisation, mit ihrer Aufbau- und Ablauforganisation, sprich mit Ihrer Prozessstruktur, die optimal aufgestellt sein muss, um diese Produktstruktur zu liefern, die wir dann an den Markt bringen. Hinter der Delivery Organisation stehen die einzelnen Ressourcen, das wichtigste ist Staff mit seinen Skills, das Zweitwichtigste sind die externen Ressourcen und das ist das Thema Sourcing. Und das Ganze wird abgerundet über ein Performance-Management, was für uns eine eigenständige Dimension im Rahmen von Strategie ist, um sicher zu stellen, dass wir sozusagen ein selbst lernendes System haben. So dies sind für mich die 8 Elemente einer Strategie, die man durchdenken muss, die man gestalten muss,	IS strategy consists of eight elements that resemble elements of a business strategy. IS strategy contains decisions on the mission and vision of the IT unit, its culture, its customers and products, its organization and internal and external resources as well as on its performance

Case	Quote	Summary
	[…] Das ist unsere Philosophie der Welt, wie wir über Strategie nachdenken.	
7	[…] IT so in drei Teile zerfällt. Das eine ist die Anwendungslandschaft, […] Das zweite sind Infrastruktur-Themen, also Rechenzentren, Leitungen, Netzwerke usw., und das dritte ist IT-Management. […] Für] strategische Entscheidungen [...] kann man […] in jeden dieser Bereiche getrennt reingucken. […] weil es übergreifende Bedeutung hat	Information strategy as a set of strategic decisions across three areas of IT: application landscape, infrastructure, and management. Strategic decisions are those that have company-wide relevance

Table 41: 'Structures of the IP domain' in practice

4.2.3.2 Discussion

One explanation for practitioners not following the structure of the models presented in research literature is that they were unaware of them. When we asked them, all interviewees immediately negated to use any literature as a direct input for developing their information strategies. Only two (cases 4 and 5) of them were able to name the most recent publications they used in the context of SIP after some time of thought. Both referred to the book "IT Governance" (Weill and Ross 2004) and to the article "IT doesn't matter" (Carr 2003). One participant (case 4) stated that he used a book about team building as a reference. Another one (case 12) said that he had read a book edited by practitioners and consultants (Bernhard et al. 2003; Bernhard et al. 2004). Two participants (cases 1 and 9) stated that they used online resources provided by practitioner magazines to stay up-to-date. The other interviewees (except case 3) said that they relied much more on recommendations made specifically for their company by management consultants who had advised the company in the past or on reports by industry analysts such as Gartner, IDC and others. One interviewee (case 4) stated that rather than plowing through the wealth of literature, he would much prefer to write his own articles and books, because that "would make [him] think the whole thing through [him]self".

In summary, most of the interviewees did not use academic literature and were therefore unfamiliar with the respective proposals. Because there were no convincing reasons presented within these proposals, which would have allowed us taking the position of a proponent of any of the models or issue lists presented in literature, we did not discuss them further with practitioners or experts. Hence, we did not ask the practitioners for their reasons for not employing a specific model (such as Earl's model).

4.2.3.3 Results and insights

Rather than adopting any of the models proposed in the academic literature, the practitioners had devised their own structures. Many of the decision areas can be mapped, though. This demonstrates two things: a) there seems to be a desire (in both research and practice) to structure information strategy and b) strategic IP decisions touch upon several decision objects, and are not just limited to one decision area (such as the application portfolio), as some authors assume.

Consequently, we will base our proposal for information strategy content on a structure of the IP domain, as well. However, as the lack of reasoning in those models that are only based on such a structure shows, the structure of the IP domain cannot serve as the sole basis of our proposal.

4.2.4 Conception 4: Functional strategy

A number of research articles we studies viewed information strategy as a functional strategy (see Chapter 2). The starting point for such an information strategy is the objectives that the function has to fulfill. The contents implied by this conception were decisions on functional and departmental issues including its mission as well as on all the resources needed to fulfill the objectives. The decision object of these decisions is the set of IP activities rather than the IP assets (systems, technologies, etc.) themselves. Again, little in the way of reasoning was provided for viewing these decisions as strategic beyond an allusion to the organizational hierarchies of strategy that include functional strategies, implying that these decisions are made on a departmental level and that they are meant to help execute business strategy.

That information strategy is sometimes considered a functional strategy was empirically supported, but this view was found to be held by a minority of practitioners (Wilson 1989).

4.2.4.1 Presence in practice

In the interviews, a number of decisions concerned the company's information function (IF) and its organization. These decisions include those made on IT process standards (decision area d), the organization of the IT unit and HR plans (decision area h), the role of the IT unit (area i), the sourcing of IT activities (area k), and to some extent, the distribution of responsibilities for IT decisions (decision area j). As shown in Chapter 3, these decisions were part of information strategies for very different reasons. Concordantly with the original meaning of functional strategy (Vancil and Lorange 1975), namely to make decisions on the departmental level that support the execution of the business strategy, decisions from areas j and k have

also been argued to be strategic for exactly this reason. Decisions from these areas have to be made in a way that supports the execution of the business strategy: the business unit-level strategy sets a number of requirements for execution that have to be taken into account on a departmental level.

In the literature, the decisions pertaining to functional strategies are thought of as being located on the department level within an organization. However, the interviews show that not all strategic IP decisions are made on a departmental level. Practitioners argued that information strategy decisions are made on different levels within the organization. Beyond the departmental level, they also referred to the corporate and business unit levels (Table 42).

Furthermore, not all strategic IP decisions are concerned with the IT department or the information function (e.g. architectural standards).

Case	Conception quote	Conception summarized
8	200: Wer macht noch IT-Strategie?, da gibt's bei uns eben Corporate, in der Group, in der Holding gibt's die zentrale CIO-Funktion und dann gibt es noch eine dezentrale CIO-Funktion, die ist jeweils bei den einzelnen Business-Units.	Information strategy at the corporate and business unit levels
11	14ff: wenn wir über IT-Strategie redden, dann reden wir mindestens mal über eine [...] für jede Business-Einheit und eine für den Konzern gesamt […] 133: ist in meinen Augen eher so eine Geschäftsstrategie als eine IT-Strategie. Es ist eine Geschäftsstrategie des IT-Bereichs oder eines IT-Bereichs	Information strategy exists on the corporate level, the business unit level, and the IT department level

Table 42: Strategic IP decisions made on different organizational levels

4.2.4.2 Discussion

Parts of the information strategies described by the interviewees followed the conception of a functional strategy. The explanation given by practitioners for the fact that information strategy was not fully regarded as a functional strategy was that strategic IP decisions have to be made on different organizational levels and do not only concern the IT unit or information function. Interviewees on a corporate level (case 5, 8, 9, 11) stated that they allocated mostly decisions on application and technology standards (decision areas b, c) and decision rights (decision area j) to the corporate level, while decisions on the application portfolio (decision area e) were allocated to the business unit level. An explanation for this is that it is simply the corporate center's objective to ensure synergies across and to regulate business units (Bowman and Helfat 2001; Collis and Montgomery 1999; Porter 1987). However, decisions on standards and decision rights were not exclusive to the corporate level. They were also made on the business unit level. For example, the interviewee in case 6 argued for independ-

ence in making decisions on decision rights (decision area j) on the business unit level to gain more independence from the corporate group.

4.2.4.3 Results and insights

In practice, information strategy is not solely a functional strategy. Strategic IP decisions take place on all organizational levels. This is plausible, because there are a number of IP decisions that are not functional, but cut across all organizational levels and are certainly outside the accountability of the IT department (such as setting the budget or deciding on IT-based business initiatives).

We conclude that information strategy does indeed have a functional component, but that strategic IP decisions are made on all organizational levels and go beyond functional or departmental decision areas.

4.2.5 Conception 5: Tenor towards IP

A number of articles viewed information strategy as expressing management's or industry requirements that imply an overall stance to be taken towards IP. The decision on the role of and general attitude towards IP then constitutes the content of information strategy. It was partly seen as an (ex-post) behavioral pattern and partly as deliberate posture. The reason offered in the respective articles for this decision being considered strategic is that it provides coherence and guidance for subsequent IP decisions.

4.2.5.1 Presence in practice

In our interviews, the role of IP was not an explicit part of information strategy. As mentioned above (see conception 2), some interviewees had a sense of what the attitude towards IP was in their companies. But this attitude was a rather implicit notion and not made in the context of a deliberate strategy (e.g. in case 13, the overall stance was to not be a pioneer at the cutting edge of technology innovation; in case 9, IT was regarded as a "tool").

However, we found principles in a number of decision areas that were meant to guide subsequent decisions within these areas. For example, we found that the decision on the role of the IT unit (decision area i, e.g., whether it should act as a service provider, as a business partner, etc.) was considered part of information strategies. Other examples of principles included the overall stance towards sourcing ("we prefer buy over make") or the principle that IT services should be secure but in a cost-efficient manner.

4.2.5.2 Discussion

The interviewee in case 8 provided a good summary explanation for why the decision on the tenor towards IP was not considered an explicit part of information strategy: he claimed that it was too dependent on the leadership's personal opinions and on the company's culture. Hence the tenor towards IP was rather a latent norm underlying many other decisions rather than seen as a deliberate decision that could explicitly guide other decisions.

Case	Conception quote	Conception summarized
8	834: also das ist stark führungspersonabhängig und stark auch kulturabhängig. In den letzen Jahren kam das [daher] bei uns so nicht vor	The role of IT is bound to the IT executive

Table 43: Reasons for not deciding on the tenor towards IP

The first expert confirmed that the role of IT is mostly an implicit rather than an explicit decision:

> "561: Das ist eine Werthaltung […] [die] schwingt mit, aber ist nicht explizit"[67]

4.2.5.3 Results and insights

Indeed, the role of IP is a normative decision if it only reflects the attitude of managers. In this function, it is a factor that may influence information strategy content but is not part of information strategy itself.

However, if the tenor goes beyond personal attitude by reflecting market requirements (see Section 2.3.5), it is a governance statement that is intended to ensure that potentials are built and decisions are made in compliance with market requirements.

This also becomes clear in the underlying rationale of a tenor, namely to guide decision-making by serving as a plank. This reasoning was present in practice, as well. We interpret the fact that practitioners included maxims or principles as part of their information strategy as evidence for the need for overall guidance of decisions. However, rather than only having a rather abstract statement on the role of IP, practitioners seem to require more operational break-downs in the forms of principles to guide decisions in different decision areas. As stated above, if this guidance aims at ensuring that decisions are made in accordance with market requirements or with building and maintaining required potentials, these maxims and principles are strategic governance decisions in our view of strategic purposes (cf. Section 4.1).

[67] Translation by author: "That is a normative attitude […] that is latent, but not explicit"

Some authors support the idea of having principles to guide IP decisions in different decision areas. “Principles are simple, direct statements of an organization’s basic beliefs about how the company wants to use IT over the long term.” (Davenport et al. 1989, p. 131). The idea of “guiding principles for IT” (Broadbent and Kitzis 2005, p. 4) is also found in the concept of “IT maxims” (Broadbent and Kitzis 2004). A simple statement on the tenor towards IP (e.g. “IT is a strategic weapon”) is rather abstract and probably not operational enough. In contrast, breaking the tenor down into principles on the level of decision areas might help to “bridge the communication gap between top managers and technical experts” and ensures that “business strategy [in our view: market requirements] drives technical strategy, as conventional wisdom says it should” (Davenport et al. 1989, p. 131) but also that required long-term potentials are built and preserved (see the discussion of conception 1 in Section 4.2.1)

* * *

In summary, no conception from research matches the information strategies found in practice perfectly. Nevertheless, the conceptions do provide partial contributions for the strategic relevance of IP decisions. Hence, we now look at strategic IP decisions from the point of view of practitioners and evaluate whether the reasoning used to argue their strategic relevance is backed in theoretical discussions.

4.3 Backing of Information Strategy Content and Reasoning Found in Practice

After having scrutinized the proposals from research literature, we also need to discuss the content of information strategies in practice. The guiding question is whether there are good reasons for the content of practitioners’ information strategies to be regarded as strategic. The practitioners gave reasons for viewing the decisions they included in their information strategies as strategic. However, are these reasons meaningful in the sense that they can be relied upon to claim a decision as being of strategic relevance? In order to answer this question, we have to look for a backing of practitioners’ reasoning. To this end, we look for theoretical backing in literature, asking whether we “can we find support for this way of arguing in currently accepted theories […]?” (Toulmin et al. 1984, p. 68) or theoretical discussions. We look for theories and theoretical discussions on strategy and strategic management (see Section 4.1 for our view of strategy in the light of strategic management literature). These need not necessarily been applied in the literature on information strategy we identified in Chapter 2. In fact, the discussions need not necessarily been applied to the field of Information Systems at all so far, even though this would facilitate for matching them to the argumentation

used by practitioners. On the basis of practitioners' reasoning and the potential backing provided in literature, we then have to discuss and judge whether the respective decisions can be considered strategic according to our view of 'strategic' (cf. Section 4.1).

In the following sections, we walk through the different causes or impacts mentioned by practitioners and discuss for each pair of decision and reason whether it can be backed. For each decision area, we first briefly summarize the decisions elicited in our interviews which we grouped into the area as well as the reasons provided by practitioners for viewing them as strategic (see Chapter 3 for details). Then, we summarize the backing we found in literature for these decisions to be of strategic relevance. On the one hand, this backing might be given by literature we identified in our literature review (cf. Chapter 2). On the other hand, we rely on literature that does not primarily focus on information strategy content but may focus on the respective decision area (such as investment portfolio) and provides arguments for the strategic purpose of the decision. Furthermore, we might find arguments in strategic management literature as providing backing. On the basis of the arguments provided in practice and literature, we discuss the strategic relevance of the decisions. This is accomplished by referring back to our view of strategy introduced in Section 4.1. The question here is whether the decisions contribute to a company's market decisions, the potentials fulfill the market requirements or the strategic governance that ensures that the potentials get built, preserved, and used in order to make market offerings. Our judgment of whether the decision is strategic from this perspective concludes the discussion.

4.3.1 Application landscaping decisions (a)

Decisions on the application landscape included decisions on which business processes should be supported by IT in terms of functionality. The question was which applications (as a combination of work processes and IT) to use and which applications should be replaced, extended or renovated.

The reasons provided by practitioners for these decisions being strategic were the fulfillment of business strategy requirements (see reasoning in Section 3.2.3, Ad 1: Effects related to business strategy), the satisfaction of business requirements (see reasoning in Section 3.2.3, Ad 2: Decisions that help to satisfy business units' requirements) and the need to stay flexible in face of unknown changes (see reasoning in Section 3.2.3, Ad 4: Decisions that affect the company's flexibility).

4.3.1.1 Backing in literature

In proposals following the third conception (information strategy as a plan for the IP domain), we find a number of references to "application plans" including a "high-level specification of applications" (Lederer and Salmela 1996), decisions on retiring older systems (Wexelblat and Srinivasan 1999), "application areas of IT" (Reponen 1994), "selection of application areas" (Lucas and Turner 1982) as well as "[…] system requirements that are most critical to the success of the firm […]" (Pyburn 1983).

Hence, the decision on which applications are needed for which processes (or for which requirements, i.e. to solve which business problems) as well as the decision on keeping these applications up to date are included in proposals from literature. However, we do not get insights into why they are included from these sources.

We also find references to the application landscape in the literature on IS/IT architecture. Whole books are written whose titles point towards a strategic role of architecture (e.g. Keller 2007; Ross et al. 2006)[68]. Architecture is defined there as the "organizing logic for business processes [digitized in the form of applications] and IT infrastructure" (Ross et al. 2006, p. 9). The original notion of architecture in the field of IS (Zachman 1987, p. 276) was "a logical construct (or architecture) for defining and controlling the interfaces and the integration of all the components of a system". Different types of architecture exist (cf. Keller 2007): e.g. the architecture of the IT infrastructure, the architecture of individual applications or the functional architecture. The interviewees talked about the functional architecture which is a "functional general lay-out plan"[69] (Keller 2007, p. 26). It defines not only the applications needed (which can be thought of as a matrix of processes and technical systems, which together form applications) but also the overlaps and interfaces between them (i.e. in the original definition by Zachman, the components (here: applications) of the 'system' and their interfaces). In that sense, the functional architecture comprises the application landscape.

The application landscape and architecture are said to provide "a foundation for [business] execution" in that they are "digitized business processes automating a company's […] capabilities" (Ross et al. 2006, p. 4). They are prerequisites for success because they define what the company can do with IP. Using an analogy, Ross et al. (2006, p. 5, emphasis added) state that an "athlete will have muscles, reflexes, and skills that are not easily changed. But these

[68] The titles are "IT-Unternehmensarchitektur: Von der Geschäftsstrategie zur optimalen IT Unterstützung" and "Enterprise Architecture as Strategy" respectively

[69] Translated by author; originally "fachlicher Generalbebauungsplan"

capabilities give athletes a tremendous ability to react, improvise, and innovate *in their chosen sport*. Similarly, *digitizing business processes requires making clear decisions about what capabilities are needed to succeed*." Interestingly, digitizing business processes in applications is argued to make the individual processes less flexible, while the whole company extends its room for action. This coincides with practitioners reasoning of assuring that applications can still be used even though the environment changes: practitioners tried to design the application landscape so that it is adaptable and increases the company's flexibility.

4.3.1.2 Discussion and judgment

The decisions on the application landscape influence how business processes will be run in the future. Here, it is not argued that each application has a strategic (e.g. competitive) impact. For example, the introduction of an accounting application creates value through the accounting processes supported through the application (e.g. cost savings), not necessarily through the differentiation of the company from competitors. Hence, simply because the decision helps to fulfill business requirements is not a reason for viewing the decision as a strategic decision.

However, the decisions on the application landscape may be viewed as the decision of which applications (resources) the company needs in order to make the intended market offerings or to fulfill market requirements. The application landscape (as a set of resources) then defines the potential of the company to act on the market with the help of IT. Ross et al. (2006, p. 6) talk about "IT [based] capabilities" rather than "IT [based] solutions", implying that it is not solving the business problem (or satisfying business units' requirements (see Section 3.2.3, Ad 2: Decisions that help to satisfy business units' requirements) that the application addresses that is strategic, but the overall capability of the company that allows to perform certain market activities in a more routine way.

The architecture of these applications is a form of organizing resources (in this case applications). Just as the organization of human resources that represent potentials for the conduct of a market strategy would be part of our view of strategy (see Section 4.1), the organization of applications for that purpose is also strategic: it serves the same purpose, namely to enable the company to make the intended market offerings or to fulfill market requirements.

In conclusion, the decision on which applications are needed in order to support the intended market strategies and how they are arranged (in an architecture) is a strategic decision targeting to build potentials as well as their organization.

4.3.2 Application system standards (b)

We subsumed three decisions within this decision area which all center around introducing common characteristics for applications. Again, applications include not only IT systems but also the work processes supported by them. The decisions were which applications can be standardized, i.e. which processes are already or shall be made similar so that they can be supported by the same IT systems; for which processes can standard software be used and where is custom-built software required; which applications need to be made compliant to external auditing standards?

The main reasons for viewing the first two decisions as strategic were that application (and hence business process) standardization might interfere with a differentiation strategy on the one hand but allows to extract synergies across business units or functions on the other hand (see Section 3.2.3, Ad 1: Effects related to business strategy). The main reason for viewing the third decision as strategic was that compliance to external standards was a necessary prerequisite to fulfill the strategic objective of going public on the stock exchange in the near future (see Section 3.2.3, Ad 1: Effects related to business strategy).

4.3.2.1 Backing in literature

Application standards were not mentioned explicitly as a decision area in any of the conceptions of information strategy found in literature. The decision may be hidden behind terms such as “applications architecture” which are included in some of the lists of information strategy content listed in Table 9 (conception 3: information strategy as a plan for the whole IP domain). We might interpret application architecture decisions to include those on the standardization of applications.

However, we find discussions on application and business process standardization being related to strategy in at least two streams of the broader literature.

One stream stems from Business Process Reengineering (BPR). Here, it is stated that “Companies made up of many different business units will face an important strategic question […]: Should all units do things the same way, or should they be allowed to tailor their processes to their own needs?”, a question termed “The Question of Process Standardization” (Hammer and Stanton 1999, p. 114). As processes are reengineered in BPR with the help of IT systems (see Section 4.1), process standardization goes hand in hand with application standardization. The value of standardizing applications lies inter alia in lowered overhead costs (fewer process owners, fewer different IT systems, etc.). However, beyond increased operational efficiency, application standardization is said to serve strategic purposes, as well. On

the one hand, it creates the opportunity for the company to extract synergies from the different business units, e.g. through "one face to its suppliers and customers" (Hammer and Stanton, p. 114). This way, standardized applications enable the company to meet market requirements and adapt their market offerings (e.g. by starting to combining products in cross-selling, or by following a corporate-wide customer-intimacy strategy (Treacy and Wiersema 1993)). In addition, standardized applications and processes are also said to increase the flexibility of a company, especially with regards to changing market demands: "when all business units are performing a process in the same way, a company can easily reassign people from one unit to another to respond to shifts in demand. Its organizational structure becomes much more plastic." (Hammer and Stanton 1999, p. 115).

On the other hand, process diversity allows different kinds of customers to be served differently. Here, standardizing applications would interfere with a company's "ability to meet diverse customers' needs" (p. 115).

Similar arguments can be found in literature rooted in enterprise architecture which entails "reflecting the integration and standardization requirements of the company […] (Ross et al. 2006, p. 9). Here, it is argued that standardizing applications is the main measure for integrating and standardizing business processes (and hence also the data processed by the applications): "The key to process integration from a technology perspective is […] standardization" (Weill and Ross 2004, p. 31). Again, the standardization and integration of business processes seems to be a main issue for corporations that comprise multiple business units: "A key strategic decision for multi-business unit enterprises is how to structure business unit relationships" through either business unit synergy or autonomy (Weill and Ross 2004, p. 170). Ross et al. (2006) propose that business processes and applications need to be standardized especially if the corporation follows a "unification" or "replication" approach in extending its scope (i.e. when growing). In contrast, "diversified businesses may have much less need for standardization across organizational entities" (Weill and Ross 2004, p. 31). For example, if a company aims to have a common customer view and approach across business units, it can support this by assuring that the same applications are used across different business units. In summary, application standardization is especially needed when synergies across business units are central to market requirements.

Using standard software (vs. custom-built software) is a different form of standardizing the applications, namely by adopting an external standard. This means that the applications of different companies become standardized to some degree. However, the arguments of the

practitioner focused more on the aspects of costs (standard software being less expensive) and the above mentioned hampering of the potential for differentiation.

Literature that discusses the strategic relevance of using standard-software agrees that the use of standard-software may actually counter gaining a competitive advantage through differentiation because standard software is a common resource available to all competitors (Carr 2003; Mata et al. 1995). Following the arguments of Carr (2003), the more standard software a company uses, the less likely it will be able to accrue an IT-based competitive advantage.

Another argument found in literature (e.g. Oosterout 2006) that was not mentioned by practitioners is that the use of standard software may increase the flexibility of companies to quickly connect to and disconnect from external partners also using compatible standard software. The use of custom-built software may make the development of interfaces needed to connect to external stakeholders more difficult and may as well tie the two companies together by increasing switching costs and hence lowering their flexibility in choice of partners (Mata et al. 1995).

We did not find further arguments in literature backing the adherence to external auditing standards as a strategic decision.

4.3.2.2 Discussion and judgment

The arguments found in literature back the argumentation provided by practitioners, namely that the decision to standardize applications determines the degree to which synergies can be extracted on the one hand and the potential for differentiation on the other hand. Interestingly, application standards have not been argued much to lead to cost reductions (as a form of synergies). In fact, we find studies citing that the standardization (and ensuing integration) of applications and processes in fact requires investments (resulting in a cost increase) in the hopes of a later 'strategic' pay-off through synergies such as a common view of the customer that e.g. allows for better exploitation of cross-selling opportunities[70], etc: "companies typically make big investments […] as part of [… application and business process] standardization efforts" (Ross et al. 2006, p. 95).

Because standardization is unlikely to be the result of fortuitous happenstance, it has to be planned for (Weill and Ross 2004, p. 31). Applications (and the processes supported by them) cannot be changed quickly and easily across corporations, hence making the decision to (not)

[70] In this examples, standardized applications help to enhance "customer intimacy", which is one possible strategy according to who extend Porter's (1985) generic strategies.

standardize not easily reversible. This emphasizes that having the right applications standardized adds to a capability to repeatedly extract synergies from different businesses. Companies that do not possess this capability (e.g. because applications are not standardized and cannot be integrated easily) are likely to need considerable time and effort to extract synergies from their different business units (or might not be able at all to e.g. provide a common view and treatment of the customer). On the other hand, companies that need differentiation in their market offerings, application standardization would hurt the potential for differentiation.

Similar arguments apply to the choice of standard-software vs. custom built software: custom built-software may increase the general potential to differentiate while standard software may decrease it. Hence, the respective processes must be carefully selected in order to preserve the company's differentiation potential. The argument that the use of standard software serves the purpose of quick-connect and disconnect points towards building and preserving the generic capability of flexibility. Hence, the trade-off in this decision is between the support of the potential to differentiate through individual functionalities and work processes of custom-built applications vs. the maintenance of a generic capability that might be needed for future market offerings. The argument of cost-decrease through the use of standard software serves less a strategic purpose (see reasoning in Section 3.2.3, Ad 1: Effects related to business strategy) .

The decision that applications have to adhere to external standards in order to allow the company being listed on the stock exchange is a necessary requirement in order to execute the initiative of going public. Going public may be seen as a way to meet market requirements. Complying to standards is a formal criterion that has to be met in order to execute this initiative. The aim of the company here is to comply to rules set by regulators. Hence, the decision to comply to external audit standards is not a strategic IP decision per se. However, it forms an important part (complement) of a potential that is formed to fulfill market requirements and hence can be seen to serve a strategic purpose.

In conclusion, the decision of whether to standardize applications is a strategic IP decision. It plays a major part in organizing resources (applications) to build and maintain potentials that are intended to be used in market offerings. The decision on whether to use standard software or custom-built software is as well a decision on resources that have an influence on market offerings. The decision that applications have to adhere to auditing standards is part of an overall initiative to build a potential for meeting market requirements by going public.

4.3.3 Technical architecture standards (c)

We had subsumed decisions on IT architecture design paradigms (e.g. whether to adopt a service-oriented architecture or a monolithic architecture) as well as decisions on IT standards within this decision area. The decisions on IT standards included the decision on the extent of standardization (should we standardize and how far should standardization go), the choice of technologies and the timing of standard adoption. These standards were limited to the level of IT infrastructure, i.e. basic hardware and software shared across applications (see Chapter 1). This includes computer hardware, operating systems, data base management systems, etc.

The reasons for viewing the decision on the architecture principles as strategic were focused on flexibility and cost reduction (see reasoning in Section 3.2.3, Ad 3: Effects concerned with IP cost containment, Ad 4: Decisions that affect the company's flexibility). The decisions on setting technology standards were mainly reasoned by stating that setting standards reduces complexity (see reasoning in Section 3.2.3, Ad 5: Decisions that help to avoid or mitigate IP complexity) and hence helps to preserve the company's overall ability to act on the basis of IP. As this was achieved through regulating business units, standards were seen to provide a counter-balance to simply fulfilling market strategy (see the discussion on "deliberate disalignment" in Section 4.2.1).

4.3.3.1 Backing in literature

IT architectural decisions were considered in the third conception, "information strategy as a plan for the whole IP domain." For example, we find IT architecture and architectural standards as part of "IT strategy" in Earl's (1989) model or as part of "IT scope" in the information strategy construct described in the strategic alignment model by Henderson and Venkatraman (1993). We find the term "architecture" also in a number of proposed lists (see Chapter 2). However, as stated in Chapter 2, we do not find convincing reasons in these proposals as to which decisions exactly are strategic and why.

In the broader literature, we find some discussion of IT architecture principles and standardization. Certain IT architectural paradigms (especially service-oriented architecture (e.g. Oosterhout 2006)) are also argued in literature as having a strategic effect, especially on the generic ability of the company to react flexibly to any kind of environmental or internal changes (Duncan 1995; Hagel and Brown 2001; Ross et al. 2006). These paradigms and the underlying technologies such as Web-Services promise to increase a company's agility by modularizing components but with loose coupling based on standardized interfaces (Hagel

and Brown 2001)[71]: this shall allow to quickly connect and re-connect parts ("plug-and-play") of the infrastructure. Such agility is helpful if new applications or changes to an application are needed, which is likely to be the case in a turbulent environment. It has been argued that "traditional [hard-wired] IT architecture [acts] as a barrier to flexibility" in fast-changing markets (Hagel and Brown 2003). In stable environments, these investments into agility might be an unnecessary burden because they would rarely be needed. Furthermore, the literature cites Citibank as an example to show that the adoption of new architectural paradigms may form a potential for extending the scope of the company: the bank offers a payment-processing service as a Web Service to other companies (Hagel and Brown 2001). This was made possible only through the adoption of a new service-oriented architecture, which opened up a new market for the bank (in this example, it represented part of the ability to start a new market offering, namely to introduce a new product).

The decision on whether to standardize technologies has been argued to determine a company's ability to extract synergies from diverse businesses (Weill and Broadbent 1998, see also the discussion of application standardization above). For example, for geographic expansion (which is affecting the scope of the company), depending on the degree of integration pressures and the need for local responsiveness, the authors distinguish between global, transnational, international and multinational business strategies. They argue that a standardized IT infrastructure is needed by companies that want to follow a globalization or transnational strategy with high needs for integration of processes and that such an integration is enabled through technology standardization. The decision on how far to standardize the infrastructure is said to determine the company's "reach and range" (Keen 1991, p. 180). Reach and range determine "to whom can we easily connect?" and "what services can we share automatically and seamlessly?" (Weill and Broadbent 1998, p. 92). It is claimed that companies often find a gap between the actual reach and range and that needed by the company to make new market offerings. In that case: "strategies cannot be implemented, new products and services are delayed" (Weill and Broadbent 1998, p. 93). Hence, the decision on standardizing the IT infrastructure architecture is said to build a potential for making certain market offerings or fulfill market requirements (such as the need to extract synergies from business units).

Regarding the argument of cost reduction, literature confirms that IT infrastructure accounts for a huge part of the total IP expenses (on average almost 60% of companies' IP costs) and is

[71] Interestingly, the decision to move to a Web Service-based IT architecture has been labeled "Your next IT Strategy" (Hagel and Brown 2003).

growing at almost 10% yearly (Weill and Broadbent 1998, p. 82). The standardization of technologies can help to reduce these costs. However, in the literature, this is more regarded as a "bottom-line", operational effect rather than a strategic potential.

Regarding the argument of complexity reduction, we find a surprising discussion in strategic management literature: when following the RBV, complexity is mentioned as contributing to the imperfect imitability of strategic resources (Barney 1986; Barney 1991) and hence is a reason for resources being a source of sustainable competitive advantage. We find similar statements regarding IT infrastructure and its architecture (Piccoli and Ives 2005): a complex infrastructure may represent a "barrier to imitation" of strategic business initiatives that rely heavily on the infrastructure.

The link between complexity and flexibility has been mentioned elsewhere in the literature on agility reporting that "relatively simple [i.e. non-complex] IT architecture had enabled [companies] to deal with […] the need to quickly implement new requirements" (Oosterhout 2006, p. 141). Others report that "[i]n most cases, systems built to achieve immediate [also strategic] business needs [meant as 'without following IT standards'] have become expensive, redundant and *difficult to maintain* [emphasis added]" (Ross et al. 2006, p. 93). This complexity-induced difficulty gets paired with the long-term commitment companies enter into when they choose technology standards and hence imposes a constrain on flexibility: "[…] their [technology strategy issues'] importance stems from the fact that an organization's commitment to a specific technology may involve a time span considerably in excess of [other investments]" (Hayward 1987, p. 107). All this indicates that the decision to set technology standards has strategic implications, but mostly for future (yet unknown) business strategies rather than for supporting today's market strategy.

Turning to the decision on which technologies to adapt, we find some backing by technology strategy literature (e.g. Friar and Horwitch 1985; Hatfield et al. 2001). Here the choice of technologies is argued to be a strategic decision if the company intends to base future market offerings on the technology. Especially if no dominant technology has emerged so far or if the technology is in an early, immature life-cycle stage (also called "leading edge technologies" (Hatfield et al. 2001)), the company has to build research and development (R&D) capacities in order to exploit the potential of the technology for market offerings or for meeting market requirements.

4.3.3.2 Discussion and judgment

The strategic relevance of the choice of technology paradigm to follow (e.g. SOA vs. monolithic architecture) finds some support in the literature. Here the arguments even go beyond those of practitioners who argue with an increase in flexibility. Literature even states that new paradigms may offer opportunities for new market offerings. Hence, the decision on architecture principles has a dual strategic role: on the one hand it adds to the generic role of flexibility. The ability to quickly rearrange (connect and disconnect) parts of the architecture contributes to the company's flexibility for reacting to changes in the markets. On the other hand, it may represent a potential for new market offerings.

Again, both practitioners and literature stress that a standardized infrastructure may contribute to a company's capability to extract synergies from different parts of the business (e.g. different geographies) but may not be appropriate if these parts require local responsiveness. The decision whether and to which degree to standardize is part of building and preserving potentials of a company. It should be noted that here, it is not the decision on which technologies to use, but rather on the homogeneity of technologies.

Regarding the argument of complexity, we find some difference between literature and practice. Some authors emphasize the role of complexity in providing barriers to imitation. However, practitioners argued in a very different way: a complex IT architecture may represent a burden to the company in actually fulfilling market requirements. In this sense, IT architecture complexity may represent a "strategic liability" (see Section 4.1). Setting technology standards is then a measure to ensure that IT architecture does not become too complex and hence does not become a strategic liability. This strategic liability might be unwittingly caused by business units in their "short sightedness" for current market offerings (see discussion on "deliberate dis-alignment" in Section 4.2.1). This furnishes an example of the tension between different strategic purposes (in this case between a generic capability and particular market offerings). This explains that countering business strategy is actually putting the emphasis on preserving longer-term, generic capabilities rather than supporting immediate market needs. This is also supported by Ross et al. (2006, p. 9) stating that "architecture provides a long-term view of a company's processes, systems, and technologies so that [one can] build capabilities – not just fulfill immediate needs". In this sense, the decision to set (and enforce) technology standards and the extent to which they are set preserves a generic capability. Here, the generic capability is the company's overall ability to act on the basis of IT. If the architecture becomes too complex, this ability is hampered and the company is stymied in making any market offering based on IT ("growing complexity in companies' systems can fossilize [the

company]" (Ross et al. 2006, p. 11)). Here, it becomes clear that the value of setting technology standards extends beyond the immediate operational impact. Hence, we view setting technology standards as a strategic decision aimed at preserving the general potential of the company to provide market offerings on the basis of IT (see reasoning in Section 3.2.3, Ad 5: Decisions that help to avoid or mitigate IP complexity). The decision on which technologies actually get chosen seems to be of less relevance for reducing complexity or for enhancing the capability to extract synergies: as long as a certain standard is established, it does not matter which technology is chosen.

For cost reduction, literature did not relate cost reduction through standardization to strategy. Practitioners themselves had their doubts whether this is a strategic purpose and was regarded it as "second priority" (see reasoning in Section 3.2.3, Ad 3: Effects concerned with IP cost containment). It is indeed reasonable to expect cost reductions from setting IT architecture standards in the long run. These cost reductions are mainly a result of economies of scale. Setting architecture standards is not leading directly to cost reductions but is meant to ensure containing IP costs continuously in the future. Hence, the decision to strictly set and enforce IP standards may contribute to an overall capability to keep IP costs down. Such a capability is certainly relevant when following a low cost strategy, especially if, as literature supports, IP costs represent a large portion of overall costs.

As for the decision on which technology to choose, practitioners and literature exhibit some differences. Practitioners argued that the choice of technology is an outflow of business strategy and binds the company long term. They went down to the level of products ("our IT strategy is Oracle" (case 8)). Literature on technology strategy stresses more the value of a certain type of technology for making market offerings, i.e. in building a capability (e.g. through extensive research and development) to exploit this technology in future market offerings (such as introducing new products, product innovations, etc.). Some of the introductory examples from practice in Chapter 1 (such as Wal-Mart investing in RFID) support this argument. Here, the choice of a technology does not only represent a significant commitment, but is made with the intent to build a capability and exploit it in a number of strategic initiatives (such as redesigning the shopping process, changing the integration of suppliers, etc.). However, this intent may indeed be bound to "cutting edge" technologies.

In conclusion, all three decisions, whether to standardize and to what degree, which technologies to adopt and which architectural paradigm to follow, are strategic decisions. The degree of standardization is relevant for a capability to extract synergies from different parts of the

business and preserving the ability of different parts of the business to differentiate; it also preserves the company's generic ability to act based on IP by helping to contain complexity; the choice of technology has strategic significance for building a potential for making new market offerings; the choice of architectural paradigm is strategic for preserving the generic ability of flexibility as well as serving as a basis for market offerings.

4.3.4 Process standards (d)

Also included in practitioners' information strategies was the decision to adopt a certain standard for IT processes such as ITIL for IT operations or PRINCE2 for project management.

The reasons for regarding this decision as strategic were the hope to increase flexibility (see reasoning in Section 3.2.3, Ad 4: Decisions that affect the company's flexibility) with a new software development methodology or to be able to sustain the delivery of IP services in a professional way by adopting best practices. This shall allow the company to stay well positioned to handle future business requirements (see reasoning in Section 3.2.3, Ad 5: Decisions that help to avoid or mitigate IP complexity).

Another decision, namely to standardize IT operations processes across different IT units within a company was regarded as strategic because it helps to reduce IP costs (see reasoning in Section 3.2.3, Ad 3: Effects concerned with IP cost containment).

4.3.4.1 Backing in literature

There is no explicit reference to IP process standards in any information strategy conception. We could interpret hints on "organizational plans" in the third conception (information strategy as a plan for the IP domain) as including decisions on process organization of the information function (or the IT unit), which might cover the decision on which standards to adopt and whether to standardize IP processes across different IT units. Furthermore, the model of information strategy proposed by Henderson and Venkatraman (1993) includes "I/S processes", i.e. work processes central to the operation of IP. However, as stated earlier, it is unclear in this model whether this ("internal") part is included in information strategy or not (i.e. whether the strategy only includes the "external" domain).

In the IS literature on competitive advantage, "the ability to provide efficient […] IS operations on an ongoing basis [… to] develop a cost leadership position" and the "the ability to avoid […] cost overruns, unnecessary downtime, and system failure [are] likely to be an important precursor to superior performance." (Wade and Hulland 2004, see Chapter 2).

In the broader literature, the decision to restructure the IP processes has been found to increase the responsiveness of the IT unit (Earl 2003, p. 59; Lyytinen and Rose 2006; Oosterhout et al. 2006). For example, adopting agile software development processes was found to help the company to become more responsive to external change in that it can deliver IP based solutions faster: "changes in their [company's] system delivery processes influence or are influenced by environmental demands for agility" (Lyytinen and Rose 2006, p. 184) and "ISD [IS development agility […] may help achieve better responsiveness during exploitation" (p. 1 97).

As mentioned in the decision on application standardization, the literature on business process reengineering talks about standardization of business processes. However, here, we talk about IT support processes and not the use of IT in business processes (i.e. applications).

4.3.4.2 Discussion and judgment

The conduct of the processes mentioned (IT project development, IT operations) is not strategic. These are operational processes that are meant e.g. to deliver new applications or maintain the existing applications and infrastructure technologies. Hence, at first sight, decisions on IP processes might not seem to be strategic.

Decisions on IP processes touch the information function's way of delivering resources and services needed by other functions. The sought-for value of the IP processes does not lie in the processes themselves, but in the end-products of the processes.

Adopting standards for operational IP processes (such as ITIL for the service desk or configuration management) may improve the ability of the IT unit to deliver IP services in a professional way. These standards are collections of "best practices" (i.e. prescriptions for conducting processes in a certain way) that promise to decrease failure rates of processes. If this promise is delivered, an impact on firm performance may result (e.g. through increased user productivity because of less or shorter outages). If this impact can be retained continuously, then the company has increased its ability of producing resources that are prerequisites for fulfilling market requirements or making market offerings. Hence, decisions on the professionalization of IP processes add to the company's generic capability of building IT-based resources and capabilities. In this sense, the strategic relevance to the company is even more indirect than e.g. in the decision to standardize technologies. It is a question of how certain services (that deliver IP resources that might in turn be used to generate value on the market) are conducted within the information function.

The decision to standardize IP processes across the whole company (independent of whether an external process methodology was adopted) was mainly argued to reduce IP costs. This is not a strategic impact if regarded as a one-off effect. The standardization of IP operations may help to reduce cost in the future by giving more control and hence may provide value beyond reducing cost, namely by adding to the ability to keep cost low in the future, as well. However, this value seems to be provided more through the decision on centralizing the responsibility (see decision area j below) of operations rather than by standardizing the processes.

In conclusion, these decisions are not directly related to a specific capability or resource nor directly related to specific market offerings. Decisions on the adoption of standards for IP processes influence the company's generic capability to produce IP resources. They also influence a company's flexibility, which is a generic capability, as well. In that sense, decisions on the organization of IP processes determine how those potentials can be built that are needed to make certain market offerings. These fundamental IP process decisions are about the organizational set-up needed to deliver IP resources and in this way fits our view of strategy (see Section 4.1).

4.3.5 Investment portfolio decisions (e)

The interviewees argued for the decision on which requests for IP investments should receive funding. The decision hence includes a prioritization of the allocation of financial resources to investment requests from different company-internal stakeholders. The main focus of the investment requests was on requests for applications (because business units typically would not request technology alone without having to solve a concrete business problem). The interviewees themselves referred to this decision as the decision on the (application) portfolio.

The reasons given for viewing these decisions as strategic were that it takes the current business strategy into account and ensures that those investments that are needed to execute this strategy receive funding (see reasoning in Section 3.2.3, Ad 1: Effects related to business strategy). Furthermore, the investments were argued to be what business users actually want from the IT unit and hence, the application portfolio was seen as the primary decision area that helps to satisfy business users' requirements (see reasoning in Section 3.2.3, Ad 2: Decisions that help to satisfy business units' requirements).

4.3.5.1 Backing in literature

The application portfolio is one of the core decision areas mentioned in articles following the third conception (information strategy as a plan for the IP domain): "It is conventional wis-

dom and practice" to see the core contents of information systems strategy as "an application development portfolio". The synonyms found for this term range from "systems development pan" (Conrath et al. 1992), "application plan" (Lederer and Salmela 1996), "application strategy" (Hayward 1987) to "application portfolio" (Earl 1989). A reason provided for the strategic relevance of this decision area is that it is the "what", i.e. what the users want from IP – one of the reasons provided by practitioners, as well.

The literature on IP portfolio management refers back to the original purpose of portfolio management, which is to balance investments (Ghemawat 2006, pp. 8; Haspeslagh 1982): "managing IT as a portfolio [… is] similar to a financial portfolio [… in that it is] striving to improve the performance of the portfolio by balancing risk and return" (Jeffery and Leliveld 2004, p. 41).

4.3.5.2 Discussion and judgment

Both, practitioners and academics use the argument that the application portfolio is the primary decision area that helps satisfying business units' (or functional units') requirements. However, giving business units 'what they want' is not necessarily strategic. Researchers themselves describe the application portfolio as a "shopping list" of applications and projects (Earl 1989, p. 68). Not all investment requests need to be strategic. Lederer and Sethi (1992, p. 25) explain that besides strategic applications the application portfolio "might embrace the selection of prosaic [non strategic] applications".

However, as we stated above, practitioners went one step beyond, arguing that the decision on which investment requests receive funding is one of the primary means to ensure that requirements necessary for market strategy (e.g. making certain market offerings) actually receive funding and hence get implemented. In other words, the decision on the portfolio takes care that those investments receive funding that are needed to deliver the given business strategy. In this sense, decision on which requests receive funding is part of strategy governance. It ensures that those potentials that are needed to fulfill market requirements or make market offerings are in fact built and used. The portfolio would then be a means to ensure that not only what the business units want gets funding but what gets funding contributes to the company meeting market requirements. Hence, the simple view of risk-return becomes more complicated in the realm of strategy. The portfolio would have to ensure that the exploitation of current potentials for making intended market offerings is balanced with building and maintaining potentials that might serve to support future market offerings. The portfolio understood in this way would help to counter the "short sightedness" of some stakeholders

which was used as an argument by practitioners (e.g. case 4) to argue other decision areas (e.g. architecture standards) as strategic. This logic of balancing immediate strategic needs and long-term strategic needs of the company (by preserving certain long-term organizational, IP-based capabilities) is applicable to the portfolio decision, as well. The IT portfolio decision does not support any specific market offering, but ensures the right balance between investing in the different potentials and exploiting them.

Another strategic decision which is underlying the portfolio management decision is 'which investments are needed to help make the market offerings' rather than the decision on which applications should be developed at all. The application portfolio decision may be inseparably linked in practice to this decision. This may be because the portfolio decision is more concrete and manifests the decision in a resource allocation decision.

In conclusion, the IT application portfolio comprises a number of strategic decisions At least in practice, the decision is linked to the selection of those investments that are needed to make the intended market offerings. It is a means to ensure that those investments that are needed to make certain IP-based market offerings in fact do get funding. Second, it ensures a balance between those investments that are exploiting current potentials and those that are building future potentials. Here, the decision is part of a strategic governance framework.

4.3.6 Budgetary decisions (f)

Practitioners included the decision on how much to spend on IP (the size of the IP budget) and the distribution of the IP budget to units spending it (business areas or functions) or cost categories (such as personnel, hardware, etc.) in their information strategies.

However, they did not provide any reasons from cause (see Section 3.2.3). They argued that budgetary decisions serve the guidelining function in that the IP budget is a long-term plan and represents a resource allocation and prioritization.

4.3.6.1 Backing in literature

Budgetary decisions are only mentioned scarcely in proposals following the third conception (information strategy as a plan for the IP domain) (Smits et al. 1997; Smits and van der Poel 1996). Hints at budgetary decisions are also provided by terms like "financial plans" which are proposed to be part of information strategy (Conrath et al. 1992).

In strategic management literature, budgets are either seen as part of short-term planning or as an instrument that ensures strategy implementation. In short-term planning the budget is seen as a means to concretize the strategy, by translating the intended measures (what do we need

to do) into detailed monetary, quantitative figures. Here, the budget is understood as a way to assess the monetary impact of implementing the intended actions, to control them afterwards and to coordinate and steer the activities of the various parts of the business system (Welge and Al-Laham 1999, pp. 587). As an instrument for ensuring strategy implementation, the budget is seen as a way to hand over (financial) responsibility to certain stakeholders with the intention to make them accountable for the execution of business strategy.

4.3.6.2 Discussion and judgment

The decision of "how much to spend on IP" is not a strategic decision in itself. Budgets also include many non-strategic aspects and may allocate resources according to non-strategic purposes.

Adding to the argument found in literature, the budget is considered typically on a short-term (one year) basis and hence does not comply with the time horizons of strategy.

However, in practice, the yearly budget planning may be the only time when actual strategic decisions get made. Hence, budget planning and strategic planning become mingled in practice.

However, there are strategic decisions underlying budgetary decisions. One is the question of which financial resources are needed in order to build other (non-financial) IP-based resources and capabilities required for making the intended market offerings or fulfilling market requirements. Here, the decision on the IP budget falls into the category of strategic IP potentials.

On the other hand, the decision on budgets (especially in decentralized planning) may act as a means to ensure that certain IP-based potentials get built and used. By allocating the IP budget to spending units (business areas or functional units such as sales, marketing, manufacturing), a decision on prioritizing their IP-based activities is made. Then, the budget decision is a governance instrument that is intended to encourage the build-up of IP-based potentials in certain areas and to discourage it in other areas. It is in this way that we understand the statement of one interviewee (case 5) with regards to IP budget being part of strategy: "Of course [it is] part of strategy. Particularly if […] you have the impression that it is not used optimally everywhere […] But not under the aspect of 'is a high or low IT budget good, that is not the focus, but really the question 'is it used in a value-generating way?'"

We fully acknowledge the need and the tangibility of budget figures and hence understand the reason to include this decision, especially from the point of view of the IT unit, on the information strategy agenda.

However, besides these pragmatic reasons, the question of "how much to spend on IP" only is strategic if it is intended to reserve the financial resources necessary for building those IP resources needed for making the intended IP-based market offerings or if it is meant to encourage building such IP resources in certain areas and discourage it in others according to a predefined intention set by market strategy.

4.3.7 Decisions on launching IS/IT projects that support market activities (g)

The decision to launch IP-based projects for the market strategy of the company (e.g. an online shop or a new product) was also mentioned in two cases as part of information strategy. The reasons for viewing this decision as strategic were that these projects are directly related to market strategy (e.g. to grow through a new distribution channel or with product development) (see reasoning in Section 3.2.3, Ad 1: Effects related to business strategy).

4.3.7.1 Backing in literature

This decision is also found in the first conception of information strategy (the use of IT to deliver business strategy). Here, we also find the same reasoning, namely to use IT in initiatives that deliver the strategy.

4.3.7.2 Discussion and judgment

This is probably the most clear-cut example of strategic decisions: the decision on whether an IP-based project should be launched that supports the market strategy is directly related to the decision on which market offerings to make.

In these cases, a new market offering is intended (e.g. to grow with a new product or with a new distribution channel). This market offering relies on IP (e.g. a new product requires the support of new applications) or is completely based on IP (e.g. the introduction of an Internet-based distribution channel). Hence, the decision to launch this IP-based initiative is a strategic decision that is either part of the market offerings or part of the potentials needed in order to make that offering.

4.3.8 HR and organizational plans (h)

Decisions on the skills and organization of IT unit's staff were also mentioned by practitioners as being strategic. These included foremost the decision on the selection of a required

skill set. Only in case 4, the determination of a quantifiable skill gap (how many people are needed with which skills), whether to fill this skill gap by external recruiting or by internal skill development (e.g. trainings, etc.), the decision to introduce skill development plans for IP staff's roles, the decision to introduce limited contracts for employees as well as the selection of important cultural values for the IT unit were included, as well. Also only in case 4, the organization of the IT unit (i.e. what are the organizational sub-units within the IT unit) was considered part of information strategy.

Reasons were rarely provided for viewing these decisions as strategic: they centered around HR resources being a scarce and important resource whose availability and allocation needs to be planned carefully in advance. Rather than being important for any specific initiative, they were argued to be important for all kinds of IP-based initiatives.

4.3.8.1 Backing in literature

IP skills and organizational issues are found in many proposals in academic literature:

Proposals following conception 3 mention "Organizational plan" (Conrath et al. 1992), "Organizational structure of the MIS unit" (Das et al. 1991), "HR strategy" (Galliers 1991) including newly required skills and new roles and responsibilities, "Organizational structure" (Lucas and Turner 1982) or "I/S skills" which are choices regarding the acquisition, training of the knowledge required to manage and operate the infrastructure (Henderson and Venkatraman 1993; however, the authors did not make it clear whether this decision area was part of information strategy or not).

Proposals following conception 4 (functional strategy) view staff and skills (as well as their organization) as resources of the function. Decisions on these resources form part of the functional strategy: appropriate human resources have to be accumulated and allocated in order to fulfill the requirements from business (market) strategy.

A reason provided for viewing decisions on IP skills as strategic is found in proposals following the RBV in conception 2 (use of IT to gain competitive advantage): "Human IT resources" (Melville et al. 2004), "technical skills", and "IT management skills" (Melville et al. 2004; Piccoli and Ives 2005; Wade and Hulland 2004) may be a source of competitive advantage. Although early arguments stated that technical IT skills might not be a source of sustained competitive advantage because they were claimed to be easily transferable between companies (Mata et al. 1995), more recent studies state that "some IS skills cannot be easily transferred […] and thus, these resources become a source of sustained competitive advan-

tage" (Wade and Hulland 2004, p. 132). This might not only hold true for managerial IP skills, but also for technical skills, e.g. the intimate knowledge of complex IT architectures which are idiosyncratic to the company, etc.

4.3.8.2 Discussion and judgment

IP skills are not a resource that directly contributes to fulfilling the intended market offerings of a company. Rather, they are needed to conduct the IP processes to develop those resources that are then in turn used for making market offerings. Hence, the contribution to market offerings is again one further level more indirect than IP processes. The IP processes that are needed to develop the IP resources relevant for making market offerings determine the required IP skills. On the other hand, the existent IP skills determine what the company can in fact deliver with the help of IP. They define the area of IP-based activity. The organization of IP unit represents the arrangements of those skills in organizational units.

Hence, determining the most critical skills of IP staff is a strategic decision because it determines the range of resources the activities the information function can build and maintain and hence which IP-based resources the company can use to make the intended market offerings. Similarly we argued the arrangement of resources (their organization) as strategic in our view of strategy (Section 4.1). Accordingly, these decisions form strategic IP decisions.

4.3.9 Decisions on the role of the IT unit (i)

Practitioners included decisions on the mission of the IT unit, on its role (e.g. to be a service provider vs. an advisor), operating principles (e.g. regularly benchmarked, sole service provider) as well as on the internal customers served and the services and products provided.

The only reason given was that these decisions provide a common ground across the company and that they fundamentally define the scope of the IT unit.

In one case, the decision on letting the IT unit serve the external market was also regarded as strategic because it effectively changed the company's business strategy.

4.3.9.1 Backing in literature

We find decisions on the role of the IT unit in conception 3 (information strategy as a plan for the whole IP domain) and conception 4 (functional strategy): e.g. Flynn and Hepburn (1994) include the definition of the IT unit's role and Earl (1989, p. 120) includes defining a "mission statement for the IT function" in his IM strategy which defines the "relationship between the IS/IT function and the rest of the business" (Earl 1989, p. 118).

Further support is found in literature on functional strategies. As stated earlier, the notion of functional strategy was originally expressed by Vancil and Lorange (1975). Functional strategy is about "determining the bases on which the function will support the desired [business unit strategy]" as well as "integrating and coordinating the function with other functions to which it interfaces" (Wheelwright 1984, p. 20). Newman et al. (1989, p. 136) state that "Business-unit [market] strategy […] is only an expression of intentions until people in the operating departments of the company carry it out. The departments are where goods and services are produced, customer's orders are obtained, new products are designed, employees trained, etc. So a bridge between business-unit strategy and department operations is crucial". This bridge is built by the functional strategy. However, some authors refute the existence of strategic thinking on a functional level, claiming that managers at this level are not in a position to look at the "big picture" (Hill and Jones 1989, p. 20). Similarly, Steinmann and Schreyögg (2002, pp. 232) also believe that there is no "strategic autonomy" on a functional level.

For the other decision mentioned above (letting the IT unit serve the external market), business strategy researchers would agree that decisions affecting the scope of the company are 'at the heart' of business strategy (Hofer and Schendel 1978). In this case, the company made the decision to also become an IT service provider. Several authors support the view that the decision to build IT-based businesses is a strategic decision. Porter and Millar (1985) talk about "spawning new businesses" e.g. by selling overcapacity in IP services; DiRomualdo and Gurbaxani (1998) refer to companies becoming an IT outsourcing provider as following a "strategic intent of IT outsourcing"

4.3.9.2 Discussion and judgment

First of all, there is a difference between the IT unit and the information function. As defined in Chapter 1, the information function is the set of all IP activities. The IT unit may perform some (or even most) of these. Practitioners did not make this distinction and it is also not made clearly within the literature on functional strategy. This might be because the IT unit is a coherent and tangible part of the information function.

We follow the arguments provided by proponents of the notion of a functional strategy: the functional strategy is not the operational activities themselves: it is a set of decisions that is meant to ensure that the operational activities really contribute to the desired ends defined through the company's intended market offerings. Operational activities do this by actually building the resources and capabilities that serve as the potentials for these market offerings.

Determining the mission and role of functions and their organizational units guides decision-making within these units to this end. Hence, setting up principles or maxims that are meant to ensure that decision-making is connected to market requirements (see discussion in Section 4.2.5 on principles and maxims around the tenor of IP) is part of the strategy governance.

The decision of a company to become an IT service provider by letting the IT unit serve the external market is also clearly a strategic decision: it directly changes the market offerings of the company. However, we would nevertheless argue that such a decision is not part of information strategy, but part of business strategy. If we considered it as part of information strategy, then all decisions referring to the scope made by IT service companies such as IBM, Microsoft and others would be part of information strategy. In these companies, information strategy would be inseparable from business strategy, eventually leading the concept of information strategy ad absurdum. Thus, we exclude this decision from being included in an information strategy although we view it as a strategic decision.

4.3.10 Rights and accountability decisions (j)

Practitioners argued for the allocation of responsibilities for making IP decisions to stakeholders within the company to be a strategic decision itself. They also claimed the introduction of mechanisms for influencing the behavior of these stakeholders to be strategic.

The reasons given for viewing these decisions as strategic were that how the decision rights had to be divided depends on the market strategy (e.g. a more decentral allocation if growth was emphasized): the allocation of decision rights (and the associated mechanisms) have to be "aligned" with market strategy (see reasoning in Section 3.2.3, Ad 1: Effects related to business strategy). However, at the same time, the allocation of decision rights was also seen as a way to manage complexity by establishing clear rules on who can decide what and to force the stakeholders to act in a desirable way for the whole company (see reasoning in Section 3.2.3, Ad 5: Decisions that help to avoid or mitigate IP complexity).

4.3.10.1 Backing in literature

Rights and accountability decisions are found in conception 3, under "Management Strategy" (Hayward 1987) or "IM strategy" (Earl 1989) which includes e.g. the decision on the degree of decentralization of decisions. An example for IP control mechanisms is mentioned e.g. by Lucas and Turner (1982): they state that the decision to introduce "charging" mechanisms for IP services helps to stay in control of IP. Henderson and Venkatraman (1993) refer to "I/T governance" as part of information strategy.

In conception 2 (using IT to gain competitive advantage), authors following the RBV argue that the "Management of internal relationships" (Wade and Hulland 2004) and the "Relationship asset" (Piccoli and Ives 2005) may be a source of competitive advantage. Allocating decisions between different stakeholders may help to manifest "rapport […] between the IS function and the business" (Piccoli and Ives 2005).

Decisions on rights and accountabilities are also discussed outside the literature on information strategy, typically under the label of IP "governance" (e.g. Ross and Weill 2002; Weill and Ross 2004). The allocation of decision rights as well as the introduction of steering mechanisms is said to set incentives that influence the behavior of the decision makers: "specifying the decision rights and accountability [… helps] to encourage desirable behaviour in the use of IT" (Weill and Ross 2004, p. 8).

In strategic management, these issues are discussed from the point of view of principal agent theory (Welge and Al-Laham 1999, pp. 47): how to make diverse decision makers (agents) act in line with the strategy set by the principal. Here, distributing the decision rights ensures that a chosen strategy gets implemented: "strategy-conforming design of incentive and control systems."[72] This need to ensure that business strategy gets properly executed has been argued to be especially relevant in corporations consisting of multiple business units and emphasizing business unit synergies. In contrast, "enterprises consisting of autonomous business units with few requirements for synergies across those business units have little, if any, need for IT governance" (Weill and Ross 2004, p. 175).

Some authors see IP governance separate from information strategy in that it sets a frame for information strategy (in the sense of being a meta decision: also strategic IP decisions are the object of IP governance decisions). Other authors view strategy and governance being two overlapping concepts. For example, Weill and Ross (2004, p. 6) state that desirable behaviors "embody the beliefs and culture of the organization as defined and enacted through not only strategy but also corporate value statements, mission statements, business principles, rituals, and structures". Hence, they view governance decisions as not merely serving strategic decisions, but also normative decisions. At the same time, they state that different market strategies (e.g. a customer intimacy strategy vs. an innovation strategy) require to make IP governance decisions differently (p. 159). Market strategy influences how the decision rights get

[72] Translated by author: "Die P-A-Theorie kann Beiträge für ein strategisches Management z.B. dann liefern, wenn Fragen der Umsetzung von Strategien (Strategieimplementierung) im Mittelpunkt stehen […] es geht dann um die] strategiekonforme Gestaltung des Anreiz- und Kontrollsystems" (pp. 47).

distributed. When market strategy changes, the distribution of decision rights may have to change.

Beyond ensuring the support of market strategy, the distribution of decision rights and the installment of control mechanisms is a trade-off between the ability to extract synergies and the flexibility of business units: "A key strategic decision for multi-business unit enterprises is how to structure business unit relationships [i.e. to make the decision between …] autonomy and synergy across business units […]" (Weill and Ross 2004, p. 170). Centralized decision making can ensure that each IP decision which gets made can be checked for its potential to extract synergies. However, it may as well represent a burden for making decisions fast and for business units to adapt quickly to changes (as argued e.g. in case 6).

4.3.10.2 Discussion and judgment

Many arguments of practitioners are backed by literature. We can view the allocation of rights and responsibilities for IP decisions to stakeholders as a meta IP decision: it is a decision on IP decisions (including strategic IP decisions). For each decision discussed in this chapter one can ask who should be involved in making this decision and which mechanisms can help to ensure that it is made in a desirable way. Hence, it is not contributing directly to any specific market offering (such as introducing a new product). The allocation of decision rights and the installment of incentive mechanisms rather have the purpose of ensuring that the required resources and capabilities get built and used as discussed in our view of strategy in Section 4.1 under the label "governance". We argued that this purpose is part of strategy and hence contributes to long-term form performance. Weill and Ross (2004, pp. vii) even write "that IT governance is the most important factor in generating business value from IT" by encouraging companies to "generate increasingly strategic benefits from IT" (p. viii).

An argument not found in literature but provided by practitioners is the reduction of complexity. Of course, clear rules reduce uncertainty of responsibility. However this is not necessarily a strategic reason. Some governance mechanisms (such as introducing charging mechanisms based on the total cost of ownership) may encourage business units to behave in a way that avoids building up architectural complexity. One possibility has already been mentioned in the IT architecture discussion above (see decision area c).

The distribution of decision rights and the decision to install certain control mechanisms represent incentive schemes, which can ensure that other IP decisions are made to build, preserve and use potentials needed for strategic market offerings. In this sense, the decisions form part of a frame for strategy execution (strategic governance): the decisions are not part of any par-

ticular strategic action on the market, and also not part of strategy implementation itself, but aim to ensure that any decision that is made gets done in order to implement the strategy.

4.3.11 Sourcing decisions (k)

Decisions related to the sourcing of IP activities were part of most information strategies in our sample. These decisions included the choice of IP activities to hand over to an external service provider, the choice of contract type and the contract design, the number of different suppliers to use as well as principles of sourcing decisions (such as: "buy before make").

The reasons provided for viewing the first decision as strategic was that business strategy has to be taken into account when making the sourcing decision: if certain activities are crucial for differentiation, they should not be outsourced. If outsourced, they may hamper the differentiation strategy. Furthermore, outsourcing was regarded as a measure to reduce IP costs. The number of suppliers was regarded as crucial for a trade-off between the company's dependency on too few providers vs. the complexity and cost increase of too many providers. Contract design was regarded as critical to avoid the impediment of flexibility by building in clauses that ensure that dependency on the provider is kept to a minimum.

4.3.11.1 Backing in literature

Few information strategy content proposals from literature (Chapter 2) include references to sourcing decisions. In the second conception, the ability to manage external relationships was argued to hold the potential of being a source for competitive advantage (Wade and Hulland 2004). One of these relations between the IT unit and external stakeholders is the relation to outsourcing providers. Here, the argument is different from those found in practice: being able to better manage the relationship towards the outsourcing provider in comparison to competitors may prove to be an advantage because this might result in continued better or less costly service provision.

We find the proposal that guidance on what should be done internally and what by contract as well as rules concerning make or buy decisions in information strategy proposals following conception 3 (a plan for the whole IP domain) (Smits et al. 1997; Smits and van der Poel 1996; Wexelblat and Srinivasan 1999).

In the literature on strategic management, we find the sourcing decision as part of strategy, because it affects the vertical integration (and hence the scope) of the company. Many strategy researchers include vertical integration as an explicit part of business strategy (e.g. Hofer and Schendel 1978; Porter 1987). This view is simply based on the fact that the level of verti-

cal integration determines what the business does by itself and what is done by other stakeholders in the external environment of the company. The decision on which (IP) activities to outsource hence fundamentally impacts many other decisions (such as which skills to build, where to allocate resources, etc.).

It is also not surprising to see the argument of cost reduction in practice: cost reduction through leveraging the economies of scale (Apte 1990) is the foremost reason to outsource IP activities (McLellan et al. 1998). As we argued in Section 3.2.3 (Ad 3: Effects concerned with IP cost containment), cost reduction is not a strategic purpose per se.

We also find support for the argument of practitioners that strategy has to be taken into account when making the outsourcing decision. Literature also dwells on the strategic significance of an activity being a criterion to be considered when making the outsourcing decision. The repeatedly emphasized rule of thumb is to not outsource IP activities that can be a source of differentiation (Willcocks et al. 1995). Here, business strategy becomes an input for the outsourcing decision: it should be avoided to outsource strategically relevant activities.

We also find outsourcing being discussed from the point of view of two theories relevant for strategic management: the RBV and the Resource Dependency Theory (RDT).

Organizational success in RDT is achieved by organizations through maximizing their power (Pfeffer 1981). This is done through minimizing the dependence on other organizations and maximizing the dependence of other organizations in the acquisition of resources (Pfeffer and Salancik 1978). RDT also posits that firm survival depends on the acquisition of necessary resources from the external environment. A strategy is a way to secure access to critical resources, i.e. a way to survive while maintaining power. IP outsourcing might be seen as a way to acquire external resources that are needed for firm survival and are not available inside the company. However, the RDT emphasizes that IP outsourcing increases a firm's dependence on external organizations (the outsourcing provider). A firm's dependence on the provider is affected by three factors: the importance of the resource to the organization, the number of alternative potential suppliers, and the cost of switching suppliers (Grover et al. 1998; Pfeffer and Salancik 1978). Following the RDT, IP outsourcing might become a threat to the company's power. This is also expressed in practitioners' arguments that outsourcing decisions are strategic because they are not easily reversible but represent long-term commitments. Following the logic of the RDT, some authors propose to increase the number of suppliers used and to introduce constant battling between these rival outsourcing providers in order to keep the company flexible and to increase the company's power (Lacity et al. 1995). Here, the

management of supplier relations is emphasized: it has to be ensured that the suppliers act so that the company is supplied with the resources and capabilities needed to make the intended market offerings.

Somewhat contrary, other researchers propose 'strategic' partnerships with outsourcing providers (Willcocks and Kern 1998). This recommendation is based on different theories with different assumptions than those of the RDT. According to the resource-based view (see Chapter 2), IP outsourcing is a strategic IS decision because it can be used to fill gaps in a firm's strategic resources and capabilities (Grover et al. 1998). In this understanding, outsourcing is a form of external acquisition of IP resources (i.e. building a potential rather than deploying it (Grant 1991)) that might be needed to complement other resources. Although these externally acquired resources might not be strategic in themselves (by definition they can be transferred from one provider to the firm), they can still complement other resources and in this combination form strategic resources. Outsourcing is then an alternative to building the resources inside the company and it is a measure to remove barriers for constructing strategic resources. McLellan et al. (1998, p. 227) find practical support that "outsourcing offers an opportunity to use resources beyond those contained in the [company] to increase competitive capabilities […]." Here the outsourcing decision helps to make use of capabilities of the outsourcing provider which are not present within the company in order to be able to support certain market requirements or make certain offerings (McLellan et all 1998, pp. 230).

So, in the context of this theory, IP outsourcing is meant to reduce gaps in the firm's resource base that cannot be closed internally and inhibit building strategic potentials.

4.3.11.2 Discussion and judgment

As mentioned before already, cost reduction is not a primarily strategic purpose. Even if following a low cost strategy, the decision to outsource certain IP activities is unlikely to yield a long-term cost advantage as outsourcing is a measure that is readily available to most companies.

The arguments offered by the RDT and RBV provide two different strategic decisions on IP outsourcing. One is centered within strategic governance, the other one in the organization of resources and capabilities.

As we stated, strategic governance ensures that the resources required for market offerings are built. Among others, the allocation of decision rights and responsibilities above (decision area

j) was argued to fall into this category. IP outsourcing now extends the range of governance beyond company boundaries to suppliers. Then, governance has to ensure that also external service providers deliver the required resources. However, here, it is not the design of each outsourcing contract that is the strategic decision, but more the decision to build and apply an ability to manage outsourcing relationships continuously.

The RBV focuses much more on the question of which potentials are required for making (competitive) market offerings but are not found within the company and hence have to be procured from external providers. Here, the question becomes one of filling capability and resource gaps.

In summary, there are two strategic decisions related to IP outsourcing: Firstly, when outsourcing is a vehicle to fill gaps in a firm's resource base hindering the building of resources required for market strategy. Secondly, the governance of the outsourcing relationship in order to ensure that the required resources and capabilities are in fact built by or in cooperation with the outsourcing provider.

4.3.12 Security and continuity plans and policies (l)

Interviewees also included decisions concerned with maintaining IT security and continuity in their information strategies. The prime decision was on which policies to set in order to avoid a critical impact on business operations (see reasoning in Section 3.2.3, Ad 6: Decisions that aim at avoiding critical impacts on operational security and continuity). In one case, security policies were argued to be essential for the company's ability to integrate and disintegrate companies in mergers and acquisitions as well as disinvestments (see reasoning in Section 3.2.3, Ad 1: Effects related to business strategy).

4.3.12.1 Backing in literature

Security and continuity policies are not found frequently in information strategies following any of the conceptions from literature. The few exceptions again lack reasoning: for example, "system reliability" is listed in the component of "systemic competencies" (Henderson and Venkatraman 1993); Hayward (1987) mentions "security" as part of IT management strategy, Lederer and Salmela (1996) include "security" as part of the data and application plan.

In support of this, IP security researchers recently confirmed that "[t]o date, the literature with regard to the formulation of the information security policy has tended to ignore its important relationship with the strategic information systems plan, and vice versa." (Doherty and Fulford 2006, p. 55)

4.3.12.2 Discussion and judgment

Threats to the security or continuity of IP are threats to smooth business operations. Outages of IT systems (whether due to a natural or other disaster or due to malevolent technical or human intruders) may cause more or less serious negative impacts on the performance of a company. In the worst case, companies may cease to exist. Companies that rely heavily on IP (i.e. that exhibit a high degree of information intensity (Porter and Millar 1985), such as the pure online bank in case 10) are threatened most. However, threats to business operations are exactly that: business operations. Of course, functioning operations are a prerequisite for the operational delivery of any business strategy, but that does not make them strategic. This is also not the case if the probability of the threats is high (as might be the case with virus or hacker attacks) or if the possible (financial) impact is high. Other threats (such as the danger of a fire breaking out in the warehouse) would also not be regarded as strategic threats; and hence, setting fire avoidance or mitigation policies, contracting fire insurances or planning measures such as installing fire hoses company-wide would also not be regarded as strategic but purely operational.

In this line of argumentation, security policies have no other (strategic) purpose beyond their protective impact on operations. Accordingly, authors have classified IT security related decisions as "operational" (Ross and Weill 2002). Carr (2003) – assuming that IT has no strategic relevance – argued that CIOs should inter alia concentrate on operational issues such as continuity and security management, implying that IT security is not a strategic issue.

Another impact beyond operations was argued in case 11, building a routinized business capability to integrate and disintegrate in mergers and disinvestments. As argued in Section 4.1, here the ability to keep the IT infrastructure in a secure state despite the fact that new systems get included or excluded frequently is a complement of the capability to merge. If a company does not possess that complement, it effectively cannot routinely integrate and disintegrate companies (because considerable manual and unreliable work needs to be done to secure the integrated companies or to be secured from disintegrated companies). Continuing without this part of the capability in fact represents another "strategic liability". Here, the strategic decision is to build such a capability to merge and disintegrate (including resources and capabilities complementing each other to form the capability).

In summary, the decision to set IT security and continuity plans per se is not a strategic decision, even if it may help to shield the company from highly threatening incidents.

However, when intended to be a complement in building an organizational capability, such as the one to integrate and disintegrate other companies smoothly, the decision on which security policies to set gets strategic significance in building potentials.

* * *

Many decisions mentioned by practitioners as part of their information strategies can be argued to serve a strategic purpose, either in meeting market requirements (or supporting to make market offerings), building the potentials the company needs to do so or as part of a governance system that ensures that the potentials are built and used. This is regardless of whether the reasons for viewing the decisions as strategic were provided by practitioners themselves or by discussions in literature.

The next chapter combines the IP decisions argued as strategic from practice with those from literature in a comprehensive proposal.

5 INFORMATION STRATEGY: THE BIG PICTURE

The objective of this thesis is to improve the understanding of information strategy with a special focus on its content (the strategic IP decisions). This should be achieved by making a reasoned proposal for relevant strategic IP decisions. This proposal shall be based on the current academic discussion, but also on practitioners' arguments. To arrive at such a proposal, we examined the proposals made in research literature (Chapter 2) and elicited the content and reasoning of information strategies in practice (Chapter 3). We then discussed and assessed the reasoning and practical relevance behind information strategy content in research and practice based on our understanding of strategy (Chapter 4).

The result is not only a reasoned list of strategic IP decisions, but also a number of other insights as regards certain characteristics of a relevant proposal for information strategy content. First, both researchers and practitioners looked out for structures of information strategy content (especially in conception 3). We will propose such a structure in Section 5.1.1. We argued that the proposed structures in research as found in the third conception (information strategy as a plan for the IP domain) were not sufficient: while they do provide a structure of IP, they do not provide any hints on why the decisions are strategic. The fact that some of these proposals link elements of their IP domain structure to a separate element – usually titled 'business strategy' (see Chapter 2) – already indicates that the authors perceive a need to justify the strategic relevance of information strategy content. Hence, a structure of the IP domain is not sufficient. Besides, elements from the IP domain need to be related to strategic purposes. These purposes are not only limited to a company's market strategy (which market offerings shall be made and which resources are immediately needed for these offerings?) as we learned from the discussion of conception 1 (information strategy as the use of IT to deliver business (in the sense of market) strategy). Strategic purposes also include more generic capabilities, which have to be considered in our proposal. We will discuss strategic purposes in Section 5.1.2. The discussion of the other conceptions as well as practitioners' content and reasoning provide us with arguments needed to structure both, the IP domain and the strategic purposes.

5.1 WHAT ARE STRATEGIC IP DECISIONS?

Strategic IP decisions are statements that link IP elements within the IP domain (the decision object) to a strategic purpose (the decision purpose). This relation is expressed in Figure 12

(which follows the notation of class diagrams according to the Unified Modeling Language, UML).

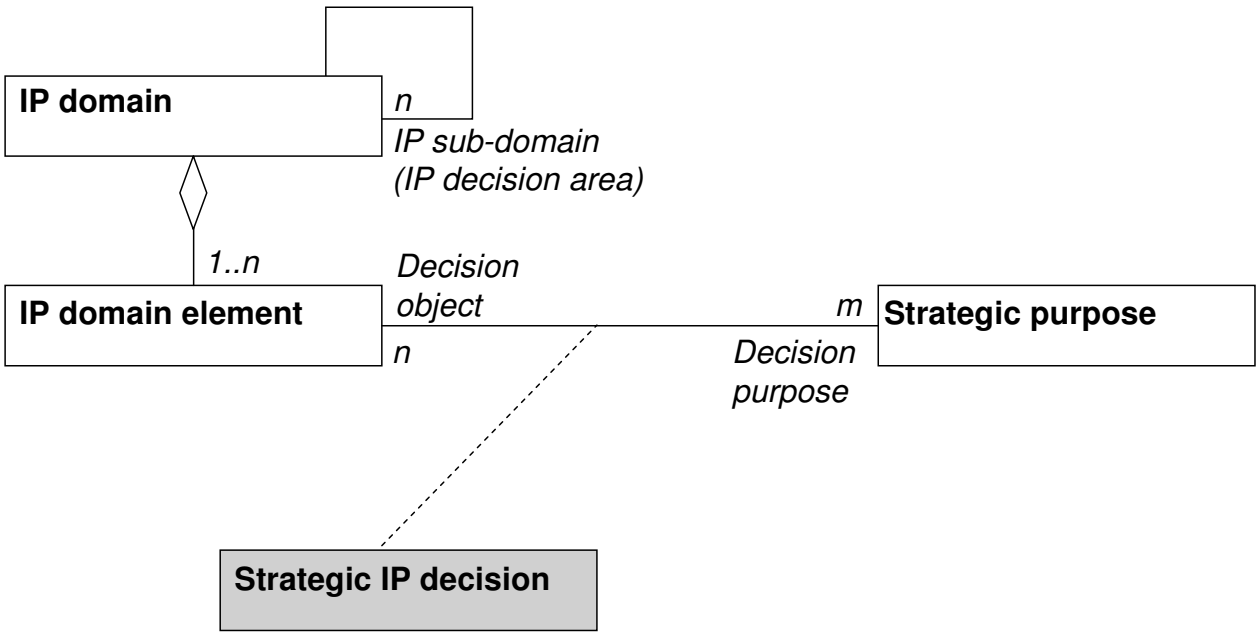

Figure 12: General structure of information strategy content proposal

A strategic IP decision represents the link between a decision object from the IP domain (which consists of multiple IP domain elements) and a strategic purpose. It is only through that link that an IP decision becomes strategic.

In the following sections, we describe each of the elements of our proposal (the decision objects and the decision purposes). We also explain how this proposal reflects requirements we derived in our discussion of proposals found in literature and practice and how it differs from current proposals in academic literature. After discussing each element separately, we turn to the overall proposal again and show how those decisions argued as strategic IP decisions from the previous chapter are expressed in the proposal. Finally, we summarize the contributions of this proposal (and hence of the overall thesis) and discuss its limitations, which may provide impetus for future research on the topic.

5.1.1 The IP domain

For a (strategic) IP decision, a fundamental question is on which object the decision is making a statement. In literature and practice, we came across very different IP elements (such as the IP processes, information technologies, IT architecture, applications, etc.). We defined the IP domain as the container of all these IP elements. Researchers who follow the third conception of information strategy (information strategy as a plan for the IP domain) mainly focused on proposing structures of the IP domain, dividing it into sub-domains (and appending each sub-

domain within this structure with 'strategy'). Practitioners also looked for structures of decision objects into decision areas (see Section 4.2.3).

Hence, a classification of the decision objects involved in strategic IP decisions seems desirable in both, research and practice. Such a structure is useful in that it helps to be clear on what is being decided on.

We need a structure that is capable of mapping the decision objects of the strategic IP decisions we found in research and practice. In that respect, any domain structure that covers the decision objects of those decisions we identified as being strategically relevant is sufficient, given that it fulfills the requirements for meaningful structures (cf. e.g. Gregor 2006, p. 624) by being collectively exhaustive (i.e. a comprehensive structure is preferred over a partial structure) and mutually exclusive (i.e. the elements of the structure should not overlap).

We briefly presented our own domain structure already in Chapter 1 in order to be able to talk in a more differentiated way about IP elements such as IS and IT. Now we argue for a structure that fits our purpose, namely to map relevant strategic IP decisions.

To this end, it is helpful to take a look again at the decision objects (or decision areas) of those IP decisions we argued to be strategic (Table 44).

Sources		**IP decision objects and areas identified**
Practice	a. Application landscaping	Application landscape and architecture: decisions on the whole set of IS (which functionality is needed; how are the IS organized)
	b. Application standards	Application architecture: decisions on the variety within the whole set of IS
	c. Architectural standards	Individual technologies: decisions on whether to adopt a specific technology IT architecture: decisions on the whole set of technologies (technologies and variety)
	d. Process standards	Decisions on IP activities (how to conduct them)
	e. Portfolio/investment	Project portfolio: decisions on a set of investment requests (mostly for applications) (which new ones to fund)
	f. Budget	Financial resources: decisions on how much to spend on IP and how to allocate the resources
	g. Projects supporting market activities	Decisions on individual IS or technologies (and how they can help in market activities)
	h. HR plan/ organization of IT unit	Skills and the organization of the information function
	i. Role of IT unit	Decisions on the IT unit (role of the IT unit, which is an organizational part of the IF)
	j. Rights & accountability	Decision rights and governance mechanisms (who should make decisions on IP objects)
	k. Sourcing	Decisions concerning the source of IP elements (where are IP elements (mostly IP activities) sourced from)
	l. Security/continuity	(Mostly not strategic; decisions concerning the security of IP elements)

Literature	Conception 1: IS to support business strategy	Decision on individual IS or types of IS that help to deliver business strategy
	Conception 2: SIS or other strategic resources that help to gain and sustain competitive advantage	Decisions on individual IS (MBV: Strategic Information Systems) Decisions on all kinds of IP resources (RBV: information systems, technologies, technical skills, managerial and relationship skills etc.)
	Conception 3: Other domain structures, e.g. the one by Earl (1989)	Various domain proposals, e.g. Earl (1989): IS, IT, IM
	Conception 4: Functional strategy	Decisions related to the information function
	Conception 5: Tenor towards IP	Choice of role for IP appropriate in order to meet market requirements and to manifest this role in principles

Table 44: IP decision objects and decision areas identified from literature and practice

In order to start with a broad classification of the IP domain that can cover the decision objects of strategic IP decisions found in literature and practice, we argue for two main areas of IP decision objects (i.e. decision areas or IP sub-domains): IS/IT and IF. IS/IT comprises information systems (IS) and information technology (IT). Both, IS and IT represent the prerequisites needed to conduct any IP-based business initiative. Hence, IS and IT form the primary decision areas of IP decisions. As mentioned in Chapter 1 already, information technology encompasses all kinds of devices and equipment that can be used for handling information. This includes hardware (such as computers or printers) and basic software (such as operating systems or database management systems) as well as communication equipment (network cabling, routers, etc.). IT is independent from solving a specific business problem; rather, it can be used to solve a range of business problems (Teubner 2003). IT has to be applied (in the form of applications) to solve a specific business problem or support the user in a specific task. Hence, besides the technology itself we also include the know-how of how to apply the technology in applications as part of information technology.

An application is based on IT, but goes beyond IT in that it also includes the work processes that are supported through the technology. Unlike IT itself, an application is geared towards solving a specific business problem (such as supporting a certain accounting process). The application together with the users of the application who know how to use the application to solve their business problem form a socio-technical system, the so called information system (IS) (Teubner 2003).

Hence, although IT and IS are related (IT forms the basis of any IS) and are both prerequisites for conducting IP-based business initiatives, they are distinct in that IT is not problem-specific but an IS is. This difference has an implication for making decisions on those two objects,

such as e.g. investment decisions. Whereas IS might be evaluated through "business cases", technologies usually cannot (e.g. Ross and Beath 2002) (e.g. because a technology may support a broad range of uses which might be unknown at the time of investment).

IS and IT form decision areas in which a number of decisions can be made on actual decision objects. The decision objects identified in the discussion of strategic IP decisions in Chapter 4 that concern IT were individual technologies (e.g. RFID, with decisions on whether to adopt a certain technology) and sets of technologies (e.g. the IT architecture, with questions of standardization and organization of the technologies). The decision objects that concern IS were also individual IS (e.g. strategic IS that help to change the market structure or support making market offerings) and sets of IS (e.g. the application landscape and architecture, with decisions on the standardization of applications).

Besides these decision objects, we also found decisions being made on the skills of IP personnel, on IP-related activities performed by the personnel (such as the development of other IP objects, such as IS) as well as on organizational units, such as the IT unit (e.g. its role). In contrast to IS and IT, the activities performed and skills owned by organizational staff members (e.g. for developing the application system or maintaining hardware components) are not directly supporting IP-based business initiatives. We refer to these activities, skills and human resources as the information function (IF). Because the IF only indirectly contributes to business initiatives (unlike IS/IT it is not 'used' within these initiatives) it is considered a secondary IP decision area. Again, this distinction has implications for making decisions on IF-related objects. Here, we rather find organizational decisions that cannot always be treated as investments (e.g. how to judge the decision on the role of the IT unit as an investment?).

We can map the objects involved in those IP decisions argued to be strategic to one of the two (or three, when distinguishing IS and IT) IP decision areas. Table 45 maps the decision areas and decision objects found in literature and practice to the proposed decision areas of the IP domain (IS, IT and IF).

Sources used		Decision areas and objects in proposed IP domain		
		IS	**IT**	**IF**
Practice	a. Application landscaping	Application landscape and architecture: decisions on the whole set of IS (which functionality is needed; how are the IS organized)		
	b. Application standards	Application architecture: decisions on the variety in the whole set of IS		
	c. Architectural standards		Individual technologies: decisions on whether to adopt a specific technology IT architecture: decisions on the whole set of technologies (technologies and variety)	
	d. Process standards			IP activities: (how to conduct them)
	e. Portfolio/investment	Project portfolio: decisions on a set of IS (which new ones to fund)	Project portfolio: decisions on a set of IT (which new ones to fund)	
	f. Budget	Financial resources: Decisions on how much to spend on IS	Financial resources: Decisions on how much to spend on IT	Financial resources: Decisions on how much to spend on the IF
	g. Projects supporting market activities	Decisions on individual IS	Decisions on individual technologies	
	h. HR plan/ organization of IT unit			Skills and the organization of the IF
	i. Role of IT unit			Decisions on the role of the IT unit, which is an organizational part of the IF
	j. Rights & accountability	Decision rights and governance mechanisms: Who should make decisions on IS?	Decision rights and governance mechanisms: Who should make decisions on IT?	Decision rights and governance mechanisms: Who should make decisions on the IF?
	k. Sourcing	Where are IS sourced from?	Where are IT sourced from?	Where are activities sourced from?
	l. Security/continuity	N/A	N/A	N/A
Literature	Conception 1: IS to support business strategy	Decision on individual IS or types of IS		
	Conception 2: SIS or other strategic re-	Decisions on individual IS (MBV,	Decisions on strategic technology re-	Decisions on IF related strategic

	sources that help to gain and sustain competitive advantage	RBV: Strategic Information Systems)	sources (RBV)	resources (RBV: technical skills, managerial and relationship skills etc.)
	Conception 3: Other domain structures, e.g. the one by Earl (1989)	e.g. IS sub-domain	e.g. IT sub-domain	e.g. IM sub-domain
	Conception 4: Functional strategy			Decisions related to the IF (mission, resources, processes, organization)
	Conception 5: Tenor towards IP	Principles ensuring that IS decisions conform to role of IP adequate to meet market requirements	Principles ensuring that IT decisions conform to role of IP adequate to meet market requirements	Principles ensuring that IF decisions conform to role of IP adequate to meet market requirements

Table 45: Mapping of decision areas from literature and practice to the proposed IP domain structure

We see that a number of decision areas and objects from research and practice cannot be mapped directly to the decision areas in our proposed IP domain. We discuss how these fit into the picture in the following paragraphs.

Budget related decisions do not concern one decision area or object (systems, technologies, activities and skills) individually. Instead, they relate to all of them in that the decision on a decision object (e.g. to introduce a certain technology) has financial implications, as well. All of the decision objects hence have a financial dimension in that they incur a certain cost. This includes the cost for technology licenses (IT), the cost for introducing a new information system (IS), as well as the cost for employing or training IP personnel (IF). The sum of the budgeted costs of all decision objects is the IP budget. Financial IP-related decisions can be located in our domain structure by introducing a financial dimension for each decision area.

Similarly, decisions on sourcing do not directly concern the decision objects, but the source from which the objects should be obtained. The sourcing of activities (the decision of which IP activities to outsource) would be related to the information function. The procurement of technologies (research and development vs. external sourcing) and information systems (e.g. the outsourcing of the whole conduct of processes) would be related to IT and IS respectively (where the latter would be a business decision rather than an IP decision). Hence, although practitioners focused on the sourcing of activities, we propose to add a sourcing dimension to all decision objects besides the financial dimension.

As stated in the previous chapter, rights and accountability decisions are meta decisions: they are decisions on IP decisions. Hence, it is not surprising that they cannot be found as a decision object themselves in an IP domain structure. For the decisions on the proposed IP objects, one has to ask who is involved in making the decision. Hence, just as with financial-

and sourcing-related decisions, decision rights require the introduction of a new dimension for each of our proposed objects.

With regards to the conceptions found in academic literature, the decision on the tenor towards IP also intends to guide other IS, IT and IF decisions. In this sense, the tenor towards IP is also a meta decision on how the decisions on the elements of the IP domain should be made and, with regards to strategic decisions, how they should be linked to the strategic purposes. Hence, the tenor is a qualifier of the link between the IP domain and the strategic purpose in that it determines the mode of decision making (such as aggressive vs. defensive uses of IP elements). We argued that the tenor towards IP is only strategic if it is based on market requirements rather than on personal attitude. Then, the tenor (and its manifestation in the form of principles, which may be broken down to the different IP sub-domains) is meant to ensure that all IP decisions are made to meet the market requirements. Hence, the decision objects of the tenor towards IP are all other decisions on IP objects.

Overall, besides the dimension of the objects themselves, there are several other dimensions: financial, sources, and rights. Different decisions are made with regards to the different dimensions. For example, decisions on the object dimension are concerned with the object or objects themselves. This includes decisions such as “which objects (e.g. technologies) are required, how many different ones are needed, how are they related to each other, when should they be acquired, how do they develop over time, etc. Decisions on the financial dimension include questions such as “how much to spend on the objects”. Decisions on the sourcing dimension focus on the source of the object such as “from where to acquire the object?” Finally, decisions on the rights dimension refer to “who makes decisions on these objects?” Hence, in contrast to the proposals of IP domains of strategic IP decisions prevalent in literature, we do not propose to assign one type of decision to a certain decision area (as Earl (1989) does in assigning the “what” to IS, the “how” to IT, and the “who” to IM). Such a proposal is somewhat misleading in that it excludes a number of decisions from certain areas.

Our proposal for the IP domain elements and the dimensions of these elements is illustrated in Figure 13.

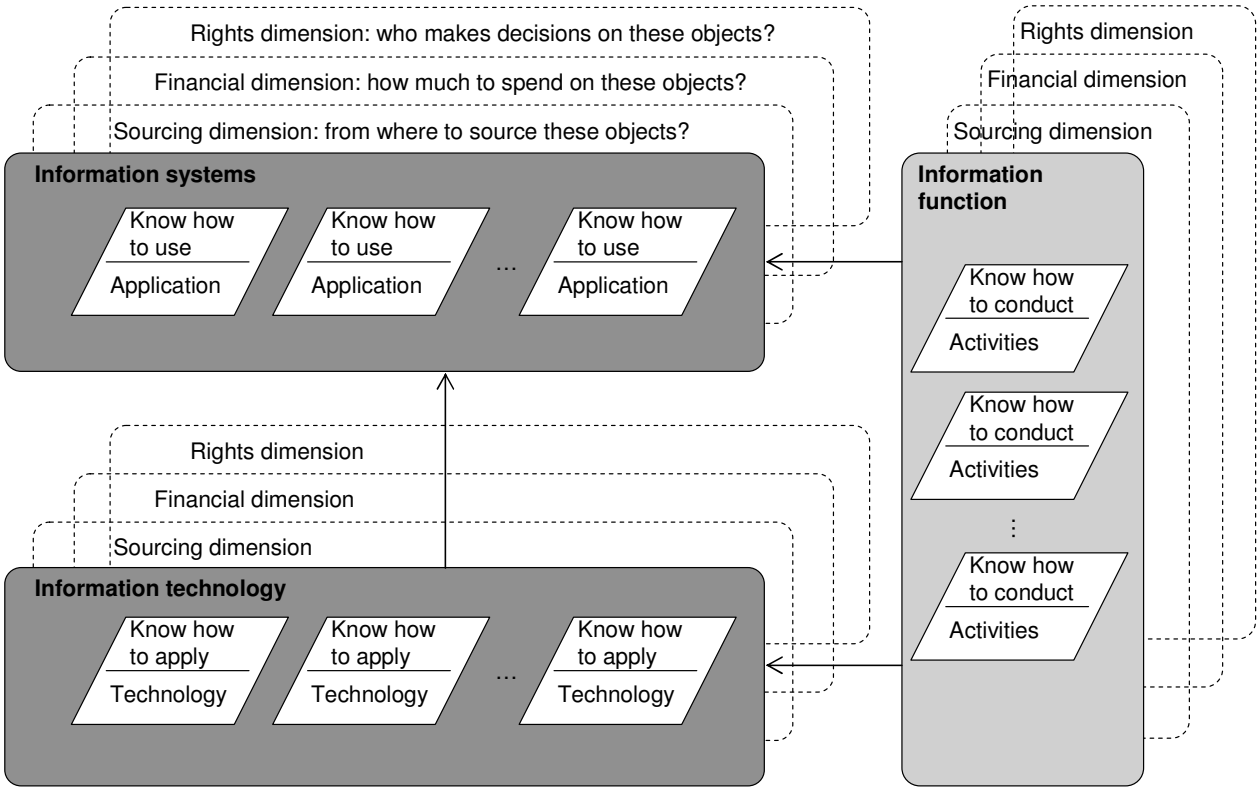

Figure 13: Proposed structure of the IP domain

In summary, we find the following decision objects of strategic IP decisions: IS related decision objects include individual IS (e.g. in the decision of whether a specific IS be built in order to support a market activity) and sets of IS (the application landscape and architecture e.g. in decisions on their variety and relations). IT related decision objects also include individual technologies (e.g. RFID in the decision of whether to adopt it or not) as well as sets of technologies (IT architecture, e.g. in decisions on how far to standardize technologies, i.e. make the set of technologies homogeneous). IF related decision objects include IP personnel and their skills and the activities conducted by them as well as organizational units (such as the IP unit) as groupings of these objects. Looking at the financial dimension of the totality of objects, we might add the IP budget as a decision object as well as the IP investment portfolio (although these are derived or aggregated decision objects in the sense that the decision on the IP investment portfolio is in fact a decision on one or a combination of the decision objects mentioned above).

5.1.2 Strategic purposes

We argued that an IP domain structure is not sufficient for a reasoned proposal of information strategy content. The structure of the IP domain does not provide any reason for IP decisions being strategic. An IP decision (on an IP object) only becomes strategic through linking the

object to a strategic purpose in the decision statement. Hence, we also have to look at strategic purposes.

Again, a number of proposals exist for strategic purposes. From literature, conceptions 1 and 2 suggested that either those decisions that deliver the business (market) strategy or those decisions that help gaining or sustaining an advantage over competitors are strategic. Practitioners alluded to a number of intentions when arguing decisions as strategic (see Section 3.2.3). In Section 4.1 we introduced our own understanding of strategy based on current discussions in strategic management literature. Here, whether an IP decision is strategic or not is determined by its purpose or intent (cf. our definition of 'strategic' in Chapter 1 and Section 4.1 as a deliberate expression of *intentions* articulated through decisions which are *expected* to yield a significant impact on long-term firm performance). In this understanding, decisions are strategic if their purpose is to affect long-term firm performance either through market decisions (choosing markets, fulfilling market requirements or making market offerings); through building, maintaining, and organizing the potentials that are required for such a market strategy; or through setting up a governance system, which ensures that the desired potentials are built, preserved, and used for the intended market activities.

We already used this proposal in Chapter 4 in the discussion and evaluation of the decisions identified from literature and practice. For example, the decision to build an online shopping information system is a strategic (IS) decision because it affects the market offerings of a company. The decision of which technologies are needed in order to make this market offering is a strategic (IT) decision because it determines the required resources to make the market offering and hence builds a potential for success. The decision to standardize the IT architecture is a strategic (IT) decision because it fosters the company's capability to extract synergies from its different businesses, e.g. through making cross-selling offers to a customer and providing a common view of the customer to diverse parts of the company. It also protects the company's generic ability to act on the basis of IP by lowering complexity which might become a strategic liability. The distribution of decision rights (e.g. centralizing IT standards decisions or project portfolio decisions) is a strategic IP decision because it is intended to encourage the behaviors needed to build and preserve the required resources (e.g. a standardized architecture) and capabilities (e.g. the ability to extract synergies) and to use them to introduce the market offering (e.g. set incentives for different business units to provide cross-selling products within the online-shop despite the risk of cannibalizing their existing businesses to some extent).

Table 46 synthesizes the discussion from the previous chapter by mapping the strategic IP decisions in each decision area from practice as well as the decision areas found in literature to our proposed strategic purposes.

Decision area	Markets	Potentials: Required resources and capabilities and organization of potentials	Governance
a. Application landscaping		Which business processes need to be supported by IP (i.e. which applications are needed/need to be renovated) to fulfill the requirements of markets/to make chosen market offerings? (landscape) How should the applications be organized (in terms of architecture)?	
b. Application standards		Which applications need to comply to audit standards in order to go public?	How far to standardize the applications (processes and software) to preserve generic capabilities (e.g. the ability to extract synergies from different business units) on the one hand and the ability to differentiate from competitors on the other hand?
c. Architectural standards	Which market offerings are made possible through leading edge technologies?	Which technologies are needed to make the market offerings? How should the technologies be organized (in terms of an IT architecture)?	How far to standardize the technologies to preserve generic capabilities (e.g. flexibility endangered by complexity) on the one hand and the ability to differentiate on the other hand?
d. Process standards		How should the IP processes be organized in order to deliver the required resources?	
e. Portfolio/investment		Which investments need to be made to support the market offerings with IP?	How to ensure that those projects get funding that are needed to build or exploit resources and capabilities in market offerings?
f. Budget		Which financial resources are needed to support the market offerings with IP?	How can we encourage certain business units to invest more/less in market offerings?
g. Projects supporting market activities	Which IP-based market offerings are intended?		
h. HR plan/org of IT unit		Which IP skills are needed to conduct the IP processes that build those IP resources required for the market offerings? How to organize IP so that it can support making the market offerings?	
i. Role of IT unit			How to steer the IT unit (e.g. what is its role) so that it builds the required potentials?
j. Rights & accountability			Who should be involved in which IP decision to encourage building, using and maintain the re-

			quired potentials?
k. Sourcing	How far do we want to be vertically integrated with regards to IP?	Which resources cannot be built in-house or could be better built externally?	How to steer the external service providers so that they builds the required potentials?
l. Security/continuity		Which security measures contribute to a capability of 'quick connect and disconnect' required in mergers and disinvestments?	
Conception 1		Which IS are needed to support the given business (market) strategy?	
Conception 2	How can we use IP potentials to introduce new market offerings/change the industry structure? (RBV, MBV)	Which IP potentials differentiate us from competitors (RBV, dynamic capability view) to provide competitive advantage?	
Conception 3	N/A	N/A	Few authors: how to keep IP under control to preserve the generic IP capability?
Conception 4		How to organize the information function?	
Conception 5			Which tenor towards IP is appropriate to fulfill market requirements/make the intended market offerings and which principles can ensure that this choice gets manifested in all IP decisions? (tenor, principles)

Table 46: Mapping of decision areas from literature and practice to the proposed strategic purposes

What becomes evident is that most decisions from practice focus on building and organizing IP potentials as well as governing the organization to encourage building, using, and preserving IP potentials. Only few decisions concern using potentials on the market. An explanation may lie in our sample of practitioners. These IT executives may be made responsible rather for the supply of potentials than for their actual use on the market.

Beyond those decisions from practice, we also mapped decisions implied or proposed in the conceptions of information strategy found in research literature to the strategic purposes in Table 46. The decisions highlighted by the first conceptions focus on the provision of IS (an IP resource) to support a given business strategy. If we interpret business strategy in this case as the market strategy (see Section 4.2), then these decisions serve the purpose of building IP potentials to support market offerings.

The decisions emphasized in the second conception focus on searching for ways to use IP to change the market structure (the MBV) or to supply resources that can be used in a way to differentiate the market offerings from competitors' (RBV).

Decision areas from the third conception can hardly be mapped to our strategic purposes because the supplied reasons for viewing them as strategic were scarce. As argued above, the focus of proposals following this conception is more on the IP domain than on the strategic purpose. The few authors providing reasons looked at keeping IP under control (e.g. Hayward 1987; Lucas and Turner 1982), hinting at decisions that aim at preserving a generic IP capability (see the discussion on IP complexity in Chapter 4 and in Section 3.2.3, Ad 4: Decisions that affect the company's flexibility).

The fourth conception focused on functional and departmental decisions which may be attributed to the purpose of organizing IP potentials (functional resources such as staff, skills, money, etc.) in order to fulfill the requirements imposed by the intended market strategy. This argumentation would be in-line with the original logic of functional strategy: making decision on the departmental level in order to fulfill the requirements set by business unit (market) strategy.

The fifth conception emphasized the choice of the tenor towards IP and on principles that help to embody this tenor in all other IP decisions. We stated that this is a normative decision if it is based on personal attitude. It becomes a strategic decision if it is intended to make decision comply to market requirements. Then the tenor is part of strategic governance that ensures that decisions and activities are made in-line with market requirements.

5.1.3 Strategic IP decisions

Strategic IP decisions link IP elements (as decision objects) and strategic purposes (the decision's purposes) in decision statements. From the proposals for IP elements and strategic purposes made separately in the previous two sections, we can combine both to arrive at strategic IP decisions. These are presented in Table 47.

IP decision areas (decision objects)	**Strategic purposes**		
	Markets	**Potentials**	**Governance**
IS ***(individual IS, application landscape and architecture)***	Which IP-based market offerings do we intend? How can we affect the market and competition with IS (SIS)?	Which applications are needed to make the intended market offerings/meet the requirements of markets intended to serve (landscape)? How do the applications need to be organized (architecture)?	How far to standardize the applications to preserve generic capabilities?
IT ***(individual technologies and IT architecture)***	How can leading edge technologies help to provide new market offerings?	Which technologies are needed to fulfill market requirements? How do they need to be organized (IT architecture)?	How far to standardize the technologies to preserve generic capabilities?
IF ***(skills, activities and personnel)***	How can we differentiate ourselves from competitors on the market through IP skills, activities, or relations between IP and non-IP personnel?	Which IP skills, IP processes and organization of these is needed in order to build the potentials?	
Financial dimension ***(budget for and investment portfolio of objects)***		Which investments need to be made to make the market offerings? Which financial resources are needed in order to build the potentials?	How can we ensure that those projects get funding that are needed to build or exploit resources and capabilities in market strategies?
Governance dimension ***(decision rights for objects)***			Who should be involved in making IP decisions so that it is ensured that the potentials are built, preserved and used? Which tenor, principles and mechanisms help to achieve this?
Sourcing dimension ***(source of objects)***	How far should we integrate vertically with regards to IP?	Which IP activities do we require externally in order to build the required resources?	How to steer the external service providers so that they build the required potentials?

Table 47: Strategic IP decisions linking IP decision objects and strategic purposes

Going through the matrix, we would like to point out two ways of reading it, which emphasizes the interrelatedness of the individual IP decisions. These interrelations may provide suggestions for paths for making coherent strategic IP decisions.

Row-wise reading (i.e. by IP decision areas) is based on the logic underlying the strategic purposes. For example, in the area of IT, a planner might start by asking which market activities involve the support of technology. A decision here has implications for the IT resources (potentials) needed. For example, it might be that a new technology is required and needs to be adopted. In turn, governance decisions may have to be adjusted in order to incentivize the company-wide introduction of this technology (e.g. if a single business unit had to bear the financial burden for building up all R&D capabilities required to introduce the new technology, this investment would probably never be made). Besides, negative repercussions on other capabilities would have to be taken into account by the planner: incentivizing business units to explore new technologies might again lead to a proliferation of new technologies being employed within the company resulting in a dramatic increase of complexity. As discussed in Chapter 4, complexity might act as a strategic liability and stymie the company's generic ability to act with the use of IT and its flexibility in connecting technologies smoothly in reaction to changed market requirements.

Column-wise reading (i.e. by strategic purpose) is based on the logic underlying the IP domain structure. For example, starting on the IS row, if new applications are required to make an intended market offering mentioned above, the planner would also have to decide whether these new applications require new technologies, because applications are based on technologies. In turn, regarding the IF, skills of IP personnel would have to be built up, or external help would have to be sought (sourcing). Eventually, all these decisions would have to be considered in the decision on how much to spend on IP.

These paths may be used by planners to arrive at a comprehensive and coherent information strategy. They emphasize that strategic IP decisions are interdependent (in at least two ways) and cannot only be regarded in isolation.

5.2 Conclusion and Outlook

In this thesis, we elaborated a reasoned and relevant proposal for the content of information strategy. We did so on the basis of proposals of information strategy content in research literature and in practice. We found that academic proposals from literature cannot fully explain practitioners' views on information strategy content but still provide partial explanations for certain IP decisions being of strategic relevance. On the other hand, not all arguments pro-

vided by practitioners are backed by theoretical discussions on strategy. Based on an understanding of strategy grounded in strategic management thinking, we made a proposal for information strategy content. Following this proposal, strategic IP decisions link decision objects within the IP domain to strategic purposes in decision statements. The previous section demonstrated that these parts of our proposal are both reasoned and practically relevant. They are reasoned in the sense of being grounded in strategic purposes derived from current discussions in strategic management thinking. They are practically relevant in a sense that they are based the discussion of information strategies found in practice. We also demonstrated that the model is able to integrate the different existing proposals found in research literature which either focused on the IP domain (conception 3) or parts of the domain (conception 4), or on selected strategic purposes (conceptions 1 and 2).

In this way, the thesis has made a number of contributions upon which further research can build. However, it also exhibits limitations that have to be taken into account. This section will discuss these contributions and limitations.

5.2.1 Contributions of this work and outlook on further research

Our work contributes to research and practice in several ways. It is the first attempt to provide a step towards a comprehensive reasoned and practically relevant proposal for the content of information strategy that goes beyond a structure of the IP domain and also beyond a singular understanding of strategic purposes (e.g. competitive advantage). The proposal adds to a better understanding of information strategy and its content (e.g. by providing a framework for the interpretation of extant research literature) which is a prerequisite for further research in SIP in general and the process of strategic information planning in particular. As we argued in Chapter 1, sound research on the SIP process requires a better understanding of the information strategy content. For example, an implication for strategic IP planning is that the planning effort has to take different dependencies into account. These dependencies might also represent tensions among elements. For example, our cases have shown that there might be tensions between building those potentials needed to conduct a certain market offering and preserving higher level generic capabilities, such as flexibility or the general ability of the company to act with the help of IP. These tensions require trade-offs and prioritizations when making strategic IP decisions. An important aspect of SIP would hence be to make these tensions among the capabilities explicit and provide a basis for weighing the arguments e.g. between hampering flexibility and introducing a new application that is needed for a newly introduced product. In that sense, one of the goals of SIP might lie in uncovering the side-

impacts caused by strategic IP decisions. Rather than focusing on isolated (and mostly positive impacts such as competitive advantage), SIP research would contribute by also looking at negative side-effects and how to avoid them. Besides being a relatively untreated field of research (cf. Arend 2004), this research would be relevant to IT executives.

The thesis has also challenged commonly held orthodoxies about strategic IP decisions and information strategy. Information strategy, for example, is sometimes classified as a functional strategy; our research makes clear the implications of such a classification. It also points out that in practice, strategic IP decisions are made on multiple organizational levels and do not only concern functional decision objects. Another common assumption is that all IP decisions have to be "aligned with business strategy" or that competitive advantage or positive impact were the sole focus of strategic IP decisions. Based on a clearer understanding of what we mean by "business strategy" when we talk about aligning information strategy and business strategy, we find indications that certain parts of business strategy might have to be countered in order to support others. The connection between IP and long-term firm performance hence might be more complex than assumed. The debunking of some unchallenged assumptions as well as breaking open the black boxes of information strategy and business strategy might constitute an important first step in the rethinking of current research agendas.

Practitioners might use the results to check their own information strategy content against. Our proposal could be used carefully as a 'checklist' for practitioners. At least, it can serve as a framework that guides information strategy planners. IT executives might find the list stimulating for asking themselves whether there are good reasons for not thinking about certain decisions or for only focusing on certain strategic purposes. It might help them to identify dependencies between strategic IP decisions that might go unnoticed otherwise.

5.2.2 Limitations

Besides the contributions, our proposal also has limitations that have to be taken into account when using it either in practice or for further research.

With respect to our methodology, we conducted exploratory interviews to elicit strategic IP decisions from practitioners from various types of industries. This approach was useful for obtaining a broad spectrum of views on information strategy. However, it created a sample that restricts generalizability. We cannot ensure that our proposal is exhaustive. While we can claim it to be comprehensive in the sense of being based on an extensive literature review and discussions with diverse information strategy planners, we cannot assert that it contains every conceivable strategic IP decision. Extending the sample size might help to some extend to

mitigate this limitation, but would still not guarantee an exhaustive or all-inclusive proposal. One reason for this is that currently there is no firm notion of contingencies that might influence the content of information strategy: not all decisions might be of strategic relevance for all companies in all situations. This is at least indicated by the differences among our cases with regards to information strategy content. Some of these potential contingencies were touched upon in our discussions in Chapter 4: for example the turbulence of the company's environment might have an influence on whether generic capabilities play a bigger role within the information strategy. The diversity and autonomy of the businesses covered by a multi-business unit corporation might influence whether issues such as standardization are regarded as important. Finally, normative issues such as the personal attitude towards IP could determine whether there is a direct contribution of IP to market offerings or not. Practitioners would certainly value recommendations on which decisions to focus on in which situation. Additional research on contingencies of information strategy content will help to close this gap and also provide an explanation for the differences between the cases with regards to the content of information strategy.

One potentially missing component from our proposal is information as a resource itself. Although mentioned only once in the literature on information strategy (in Earl's last extension to his model, adding the 'Information Resource (IR)' to his previous IS, IT and IM parts), we find some calls in the broader literature to focus more on information itself rather than on the systems and technology that process it (e.g. in the call for "Putting the I in IT" (Davenport 2000)). However, on the one hand, practitioners did not mention information as a resource at all. Again, this might be due to characteristics of our sample consisting of IT executives (although we asked them for strategic IP decisions being made by others). This at least opens the questions of the practical strategic relevance of decisions concerned with information as a resource. On the other hand, we would at least have to discuss whether information is really part of the IP domain (which is often naturally assumed; however the business processes that make use of information systems are also not part of the IP domain). Here, we would have to be very clear in the demarcation of the IP domain vis-à-vis the rest of the business.

In addition, all of our interviewees were IT executives. We obviously cannot claim that we would have obtained the same results had we interviewed business executives who are responsible for information strategy. This limitation was mitigated to some extent through the expert interviews. Two of the experts were board members also responsible for business functions.

Another limitation inherent in our sample is its restriction to interviewees from German-speaking countries. We cannot guarantee that the same results would be generated in other countries. To get a quick idea of this, we undertook one interview in the Netherlands and one in Ireland. The results from these interviews have not been included in this thesis. However, we did not detect any crucial differences among these interviews and the ones presented in Chapter 3.

Furthermore, we did not include any hard measure of whether planning an information strategy in the comprehensive way proposed in the thesis really leads to desirable firm performance. The interviewees were experienced practitioners who had presented their information strategies to peers and gotten the sign-off from their companies to do so. Hence, we can infer that they themselves as well as their companies think that the information strategy was successful. However, there is a difference between an information strategy that is *thought* to be successful and an information strategy that *is* in fact successful. We concentrated solely on formulated strategies rather than on implemented strategies. We expect a number of obstacles to lie between a formulated information strategy and a realized information strategy; impediments that might even keep a brilliantly formulated information strategy from having a successful impact.

Finally, we conducted the interviews at one point in time rather than in a longitudinal fashion. This was mitigated to some extent by asking practitioners about whether their information strategies had changed significantly in the past. However, this is no substitute for observing the change of information strategy agendas over time and being able to link those changes to events. We had to make a trade-off in terms of the time required and the number of diverse impressions from different executives though.

* * *

While our proposal has limitations, and we cannot claim our proposal to be exhaustive in terms of having identified every conceivable strategic IP decision, it could nonetheless serve as a framework, which can be used for identifying strategic IP decisions. Our proposal provides a starting point for thinking creatively about strategic IP decisions.

We hope that through the contributions as well as the limitations of this research, we have renewed researchers' interest in information strategy content. Although the field has been the object of research for some time now, many questions remain unanswered. While we hope that this thesis has answered or provided the grounds for answering some of these questions, we are sure that has also generated many more for future research in this exciting and highly

relevant field.

APPENDIX

A. E-MAIL REQUEST FOR PARTICIPATION IN THE STUDY

Dear Mr. <name of requested individual>,

On various conferences' web pages (e.g. <name of conference>), I learned that you have given a number of presentations in the context of IT strategy.

I am currently working on my PhD thesis on "IT Strategy in Practice" at the University of Muenster (Prof. Dr. Stefan Klein), Germany.

After having completed a literature analysis and initial publications, I have already discussed this topic with a number of CIOs and heads of IT strategy departments in different companies.

Due to your above-mentioned presentations and your position as Head of IT Strategy at <organization's name>, it would be great to be able to discuss which IT decisions are strategic in your company and why. The discussion should take around 90 minutes and does not require any preparation on your side.

I would truly appreciate your response.

With kind regards,

Martin Mocker

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B. Short Description of Interviewed Companies

The following sections give a brief overview of the companies in which we conducted the interviews. All figures refer to the reporting year 2004 if not stated otherwise. The interviews were conducted in 2005/2006.

Case 1

The company in case 1 is an insurance group with a total premium income of around 2 billion EUR. The group offers all types of insurances (ranging from accident insurance, auto insurance, legal protection insurance, health and life insurance) and selected investment products (mainly funds-based products). Products are sold to the roughly 3 million private customers via 2,200 agencies in Germany which are supported and directed by the corporate headquarter consisting of 2,800 employees. The company consists of four subsidiary but legally separate entities for life insurance, health insurance, legal insurance and pension funds.

As reported by the interviewee, the company was doing well and did not feel any cost pressures.

The IT department is a sub-unit of the unit "Accounting and IT", which is located beneath the board. The staff-unit "IT strategy" is located within the sub-department "IT infrastructure". The interviewee is the head of the staff unit "IT strategy" consisting of another full-time staff member.

Case 2

The second company we interviewed was also an insurance company with approximately 1 billion EUR premium income. The company serves private and corporate customers within a region of Germany. Other (sister) companies – all of them organized under a central holding company employing about 3,500 employees – serve other regions of Germany. The products within that region (accident and indemnity insurance) are sold via 500 own agencies and 1,500 agencies of an affiliated bank. The company also takes care of all the group-wide benefits processing for life insurances.

The four IT departments report directly to a board member responsible for IT. One of these departments is "IT Development". We interviewed the head of this department.

When we conducted the interview, the company was considering to merge the IT unit with another IT unit of the affiliated bank. However, we discussed the information strategy before these considerations due to confidentiality reasons.

Case 3

The third case company is a health service group consisting of three business units, together generating a revenue of around 4 billion EUR. The company is active globally in more than 100 countries. These units develops and sells medical equipment used by medical doctors and hospitals for the treatment of certain diseases and offers accompanying services (such as monitoring of patients). Furthermore, it manages hospitals itself.

The IT unit was run as a profit center and headed by a CEO who was the CIO of the whole group reporting directly to the group's board at the same time. We interviewed this person.

The company was targeting a tremendous growth (today, it has almost doubled its revenue) through acquisitions but also through organic growth.

Case 4

The fourth case organization is a public, supra-national public administrative body, which is responsible for currency-related services such as statistical analyses and money transactions. The institution is headed by politically elected members of the board and consists of several directorates, directly reporting to the board. One of these directorates is the IT unit. Overall the company employs around 2,000 staff members, 200 of them within the IT unit.

We interviewed the director of the IT unit. He reported that the institution – which was founded only a decade ago – had undergone turbulent times in which it had to build up its service offerings. When we conducted the interviews, the company had moved into more stable operations.

Case 5

This company (headquartered in Germany) is a global telecommunication corporation, offering fixed-line, mobile and data services through three separate business units. A fourth business unit is a full-service IT provider that also serves the other business units. The whole group generated revenues of approximately 50 billion EUR with around 240,000 employees.

We interviewed the Vice President of Corporate IT Management, a staff unit of 20 employees located in the corporate center.

The company was reported to be constantly undergoing restructurings. When we conducted the interview, the allocation of responsibilities for IP decisions was under reconsideration.

Case 6

In the sixth case, we interviewed at a private Swiss investment bank, which formed part of a large banking group. It had roughly 24 billion EUR assets under management and 700 employees (the group employs 60,000 staff members).

We interviewed the director of the IT department who was two reporting levels beneath the board. The company was reported to expand massively, especially by opening up or acquiring new regional offices.

Case 7

In case 7, we interviewed at a unit within a global logistics group. The group offers delivery of mail, packages as well as financial services. The unit itself is responsible for delivering mail world-wide (but not within Germany, although the headquarters are there) and generated revenues of 17 billion EUR. It is organized by regions. The regional offices operate within their countries, but also report to the corporate center.

Our interview partner was the head of IT, a unit within the corporate office. The CIO's in the regional offices reported to their regional CEO as well as to our interview partner.

Case 8

The eighth case company is a German universal bank offering all sorts of financial services to private and corporate customers including payments, credits, asset management and investment banking. The bank was organized into four divisions, "Private and business customers", "Wealth management", "Corporate and commercial property customers" as well as "Markets and Investmentbanking". It had a credit volume of 320 billion EUR. IT had around 25,000 employees and more than 700 offices.

The bank has a central IT unit that serves the divisions. Our interview partner was the deputy head of IT strategy, located within the corporate center of the bank.

At the point of time of the interview, the bank was in the midst of being acquired by another banking group. However, we discussed the information strategy before the acquisition.

Case 9

In case 9, we interviewed at a German public ground transportation group. The group employs more than 200,000 staff members. The group contains three business areas, passenger transportation, cargo, and transportation infrastructure. The IT services are provided to these business areas by an internal IT service provider with around 2,000 employees.

We interviewed the head of “IT strategy”, a staff unit located in the corporate center of the group. When we conducted the interview, the group was about to be privatized and aimed at going public on the stock exchange.

Case 10

The tenth case company was a German retail bank that has a pure-online business model. Customers can only interact with the company through the internet, the phone or via mail. There are no branch offices. The company’s credit volume was 48 million EUR. The whole company employed no more than 20 people. All operational business processes (including payment services, printing, etc.) were outsourced to external service providers. The employees concentrated fully on product design and management tasks (including provider management).

The IT unit consisted of two employees. Also with regards to IP, almost all processes were outsourced to external service providers. The two employees were concerned with managing the external providers and advising the other employees responsible for banking products in terms of IP. We interviewed the head of the IT unit.

Case 11

In case 11, we interviewed at an aviation group that generated 23 billion EUR revenues. The company employed around 90,000 staff members. Most of them work within one of the five main business units: passenger transportation, cargo logistics, catering, maintenance of aircrafts as well as IT services. IT services are provided by a business unit which also serves as the central IT unit to the other business units. Besides, each business unit has its own decentral IT units, as well.

We interviewed the head of IT strategy located in the corporate center of the group. The group was reportedly run in a very decentralized fashion, providing autonomy to the business units. However, the interviewee also stated that the entrance of low-cost carriers into the market increased the pressure on the company to find synergies.

Case 12

The twelfth case company was a bank specialized in providing home loans to customers in Germany who want to build a house. The deposits made by these customers accrued to 1.4 billion EUR. As a separate legal entity, the bank formed part of a large banking group.

Our interview partner was the CIO who was at the same time the Chief Process Officer responsible for business process organization. He reported directly to the CEO of the bank. The company had won several IT-related awards on practitioner conferences.

Case 13

The last interview was conducted at a ceramics manufacturer with revenues of about 1 billion EUR and employing around 10,000 staff members. The company consists of several business areas focusing on different application areas of ceramics: tableware, tiles, kitchen and bathroom. The business areas were not organized as separate legal entities.

The company had a central IT unit serving the business areas as a main functional department. Our interview partner was the head of this IT unit who held the title of CIO. He reported to the Chief Financial Officer of the company. Reportedly, when the CIO entered the company, the IT unit was in bad shape and about to be fully outsourced. The CIO reported that he had recently been able to turn this situation around.

C. Interview Guide Used in Structured Interviews

Guiding question: Are those decision areas identified in literature regarded as strategic or not? Why or why not?

Part of interview	Questions to ask
Transition to structured interview	I think that I now have a better understanding of those IT decisions that are strategic in your company. What I am also interested in: in many companies, literature for project management, software engineering, etc. is used. Do you use any books, journals or magazines for developing your IT strategy? In this literature, a number of decision areas are thought of as being strategic, although there is no final consensus. Nevertheless, I would like to understand how you deal with these decision areas in your company.
For each decision area, check, whether it is planned strategically and why or why not	Is this decision are strategically relevant in your company? If not, why not? What decisions are made with respect to this topic? Who is involved in making the decisions? Is it documented? How? You did not mention these decisions in our first part of the interview? Is there a reason fort his? As I said, these decisions are regarded as strategic. If not caring about these decisions, researchers would expect a number of problems to occur. Do you agree and how does it show up? (Aiming at reasoning)
Check whether there is a business strategy and	Are you familiar with your company's business strategy? Is it do-

whether it is known	cumented? How is your IT strategy linked to business strategy?	
Decision areas proposed in literature and reasons for potential problems, when not considered	Role of IT Role of IT unit Mission of IT unit	Lack of consideration might lead to missing guidance, no "alignment"
	Budget for IT spending	Overspending, underspending, missing prioritization, lack of incentive
	IT security policies	Inadequate security policies (too rigid, too lax), not aligned to business strategy
	IT architecture (models, blueprints defining how IT components are connected; technology standards)	No 'strategic' platform, lack of flexibility, agility, complex technology architecture, high IP costs
	Application portfolio	Unclear priorities, priorities not in-line with business strategy
	Strategic Information systems (to gain competitive advantage)	Company lags behind competition
	Strategic IT resourced (to gain competitive advantage)	Company lags behind competition
	IS architecture (plan for applications and how applications work together)	Wrong processes supported, overlaps, no synergies
	Information model	Redundancy, inconsistency
	Service catalog	Intransparency
	Organization of IT function (is there an IT unit, multiple IT units, structure of IT unit, etc.)	Unclear responsibilities,
	Skills of IT personnel	Inadequate skills, required IP services cannot be delivered
	Sourcing	Problems in delivering IT services
	IT governance (allocation of decision rights and incentive mechanisms)	Decisions not made in desired way
	IT processes	Required IP services cannot be delivered

D. Interview Guide Used in Expert Interviews

Guiding question: answering the question why practice deviates from those decision areas and reasonings proposed in research literature.

Introduction to expert: I deal in my thesis with the content of IT strategy (or information strategy as it is also called in research). The question is which IT decisions are strategic and why. I am interested in intentional decisions, not in a-posteriori reconstructed patterns.

I collected those decisions considered as strategic in literature and also in practice and I found some differences. I would like to discuss these differences with you today and get your view on whether the theoretical reasons provided in literature really do not apply or what else keeps practitioners from applying them. I am talking to you because you are an executive in practice and you also know the academic perspective very well. Hence, I would like to talk about your overall experience as an expert on the topic, not so much in your role within your company.

The broad topics discussed were structured by the conceptions found in literature:

Conception 1: Use of IT to deliver business strategy: practitioners do not only support business strategy, but also "deliberately dis-align" with business strategy. They consider information strategy as a separate strategy rather than part of business strategy.

Conception 2: Use of IT to gain competitive advantage: practitioners do not consider competitive advantage. Discuss MBV/RBV/DCV theories.

Conception 3: Plan for the whole IP domain: not discussed (due to lack of reasoning)

Conception 4: Functional strategy: practitioners do not view it as functional strategy on departmental level only. Discuss functional strategy logic.

Conception 5: Tenor towards IP: the tenor is considered only as a normative, implicit decision, not as an intentional decision. Principles are used instead.

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