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Working Paper

State of and perspectives for IS strategy research: A discussion paper

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Working Paper No. 16

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State of and Perspectives for IS Strategy Research



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Working Paper No. 16

State of and Perspectives for IS Strategy Research

– A Discussion Paper –

Rolf Alexander Teubner,
Alexander Robert Pellengahr

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Working Paper Sketch

Type

Discussion Paper on Research Perspectives

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The IT Strategy Divide and its Implications for Research – A Discussion Paper

Authors

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Abstract

Notwithstanding the substantial overall research efforts in the field of Strategic Information Systems Planning (SISP), the “IS strategy“ as the goal and outcome of SISP has received only limited research attention to date. In addition, there is considerable evidence that the debates on IS strategy in academia and practice are largely different and independent from each other. This observation motivates us to look into the existing research on IS strategy and its relationship to practice in greater detail. Our analysis reveals that academic conceptions of IS strategy do not seem to have much in common with how IS strategy practitioners interpret the construct. Both worlds seem to have coexisted independently alongside one another for a long time. This divergence leads to a number of problematic outcomes, not least of which is a considerable lack of relevance and acceptance of academic research in practice. Based on an intensive study of IS strategy perceptions in both academia and practice, we make suggestions on how IS strategy research should be reinvented in order that it may produce more reliable as well as practically useful and relevant insights in the face of the challenges of the 21st century. We concentrate these suggestions in four major propositions: (1) Strategy over Strategizing, demanding to develop an understanding of the construct of IS strategy first before focusing on SISP as the process developing it, (2) Strategy in vivo over Strategy in vitro, demanding to develop a fresh understanding of the construct of IS strategy by conducting research in the field instead of relying on strategy interpretations that are preconfigured by a small number of prevailing strategy models and theories, (3) Empiricism over Idealism, demanding that intensive field research on IS strategy should be conducted starting with deep small-scale explorative studies aiming at new insights instead of large-scale confirmatory surveys that test pre-existing hypotheses, (4) Sustainability over Competitiveness, demanding to relinquish the academic predilection for research on competitive aspects of IT in favor of issues that are much more relevant in practice, such as efficiency, reliability, serviceability and sustainability of a company's IT-based infrastructure.

Keywords: IS strategy, Strategic Information Systems (SIS), Strategic Information Systems Planning (SISP), IS strategy contents, IS strategy reasoning, IS strategy practice

Introduction

Anyone who is interested in research on IS strategy must be impressed – or daunted, as the case may be – by the sheer volume of output this field has produced over the course of its young life. Research on the process of strategically planning information systems, Strategic Alignment, the competitive dimension of IT, as well as related tools and models has been a staple of IS journals and conferences for decades.

Yet anyone who is interested in this research and is also familiar with IS strategy practice cannot fail to see how little of the knowledge academia accumulated has trickled down to practice. IS strategy practitioners neither seem to know or – if they do – to judge very favourably the output of academia. Practitioners seem to live in their own closed-off world with their own professional magazines and strategy conferences, where academic output is neither highly valued nor easily accessed.

It might be tempting to attribute this parallel universe situation merely to obstacles in the proper transfer of knowledge from academia to practice, a ‘technical’ issue that could be remedied on a ‘technical’ level. Practitioners just somehow must be motivated to pay more attention. This, however, would be taking the problem too lightly and certainly underestimate its severity. The issues within this situation – and there are several – run much deeper. Not all that is wrong with the adoption of IS strategy research can be blamed on practitioners. We believe that the problems begin with how research on SISP and IS strategy itself is fundamentally approached and framed at the moment.

In this paper, we outline the major themes underlying these problems and provide four concrete propositions on what IS strategy research should do in order to regain relevance and acceptance in practice as well as produce results that are academically reliable and a fruitful reinvigoration of the greater debate on SISP. In Information Systems research, the IS strategy is considered the outcome of Strategic Information Systems Planning (SISP). As such, the academic debate on IS strategy is a very important part of the broader debate on SISP. Hence, we begin our paper with a short representation of the state of SISP research and the role assigned to IS strategy in this research (section 2). Since the construct of IS strategy is constituted of both the underlying assumptions (the concept) and associated contents, we will show how IS strategy is conceptualized in literature (section 2.1) before turning our attention to research on the contents of IS strategy (section 2.2). In doing so, we pave the way for confronting the academic debate with IS strategy practice (section 3). The comparison of academic debate and IS strategy practice leads us to question the current state of research and practice (section 4).

1 Setting the scene: the academic debate on IS strategy

The academic debate on SISP is comparatively young. Whereas the beginnings of IT use in businesses as well as accompanying academic research dates back to the 1960s, the strategic dimension of information systems planning did not appear on the map of companies and researchers before the late 1970s. It was then that individual companies first managed to realize a competitive advantage by using information and communication technologies more effectively than their competitors. Charles Wiseman (1985) popularized the term of “strategic information system“ in order to accentuate this new, competitive view on information systems. The notion that IT can deliver a superior competitive position became so popular among academics that this time has retrospectively been identified as the **Strategic Information Systems (SIS)** era (Ward and Peppard, 2005, pp. 25). It had its peak in the academic debate in the early 1990s, after which time it gradually lost appeal because globalization and technological progress pushed for periods of competitive superiority to become shorter and less secure. First, markets for IT products and IT services had matured and these goods could be procured more and more easily. Pundits declared the age of commoditization of IT and IT as an infrastructure to have arrived (Carr, 2003). Secondly, internet-based IT solutions are highly visible and could hence be more easily and quickly imitated. As a result, the 1990s saw an increase in competition at the same time as the expectation to sustain a competitive edge gained by innovative IS rapidly diminished (McAfee and Brynjolfsson, 2008). As a result, the focus of attention shifted away from technology and systems to management capabilities, which have come to be regarded as the real foundations for leveraging IT for sustainable competitive advantage (Mata et al., 1995, Powell and Dent-Micallef, 1997, Melville et al., 2004).

In the second half of the 1990s, IT increasingly became an integral part of business activity. The term electronic business (e-business) became popular and has been used to characterize the essential role IT plays in doing business. Many organizations now began to regard IT as strategic in and of itself because it became a dominant factor in many business activities and the foundation of innovative business models. In addition, IT use fostered integration of business activities within a single company and across company boundaries. Broadly speaking, the **e-business era** was made possible by the coincidence of two technological developments. Firstly, the availability of Enterprise Resource Planning (ERP) software which provided reference models and module libraries for supporting business processes, which fostered the diffusion of best practices for doing business electronically (Thomé and Hufgard, 1996). And secondly, the maturing of the Internet allowed for performing inter-organizational business processes electronically and thus gave rise to Electronic Commerce (EC). Electronic commerce included processes to end customers (business to customer, B2C) as well as processes to suppliers, partners, or other business organizations (business to business, B2B). The need to integrate IT and business in e-business is reflected in the academic discussion on Strategic Alignment (Henderson and Venkatraman, 1993, Teubner, 2006). Strategic Alignment pays heed to the new situation of intrinsically integrated IT and business by calling for business and IS strategies to be developed in mutual alignment, as two sides of the same coin.

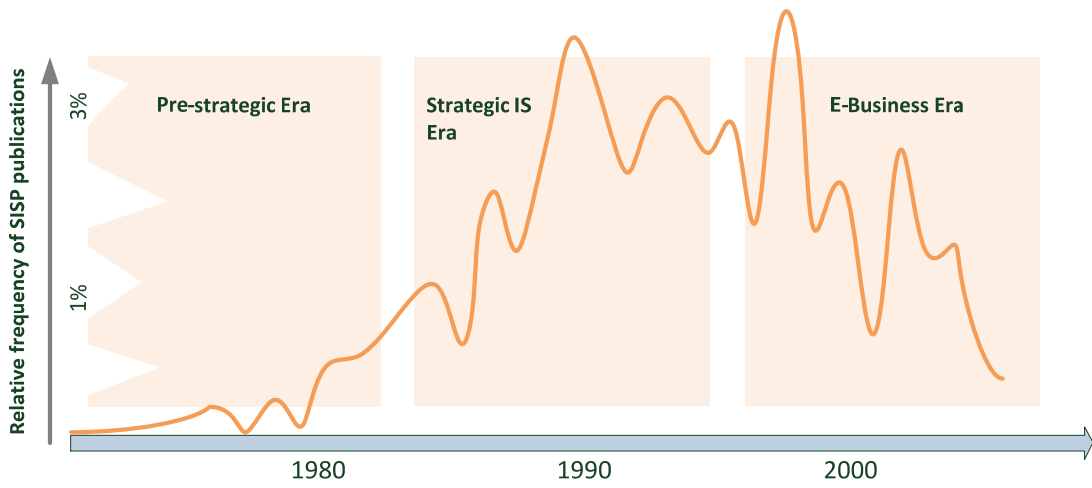


Figure 1: Development of the academic debate surrounding SISP

Figure 1 represents the development of the academic debate on SISP as a distribution graph depicting the number of publications on SISP in selected IS journals. This graph is based on the results of a literature study (Teubner and Mocker, 2008, p. 10) which included publications from 10 leading Anglo-American journals and five German Journals. The distribution graph shows two peaks in the academic debate which correspond to the attention paid to SIS in the early 1990s and to Strategic Alignment and strategic IS capabilities before the turn of the century.

A notable finding of our study is that the academic debate on SISP has not only abated over the last years, but has also been taken on with far less regularity and intensity in the German speaking IS community than in the Anglo-American one (Teubner and Mocker, 2008, p. 30, supported also by Brown, 2004, p. 26). Irrespective of the national differences, however, a comprehensive content analysis, including publications from all sources, reveals that the debate can be loosely structured into five distinct fields of research. These are in order of frequency: SIS and competitive use of IT, SISP approach, Strategic Alignment, IS strategy content, and IS strategy implementation. Figure 2 depicts the conceptual links between these fields of research.

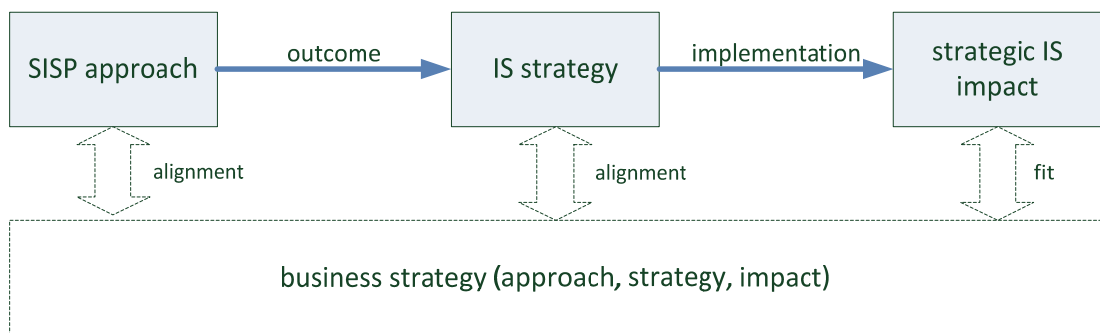


Figure 2: Central fields of SISP research and their relationships

IS strategy is an outcome of SISP (SISP approach following a certain process and organization, using certain tools etc.). The impact of the IS strategy, such as competitive advantage, may only be achieved through the implementation of an appropriate IS strategy. Finally, IS strategy can, at least conceptually, be distinguished from its counterpart on the business side, i.e. the business strategy. The reconciliation of the IS strategy with the business strategy has spawned the topic of Strategic Alignment. It is for this reason that we have included business strategy in

Figure 2, though it is not an original concern for IS research. However, business strategy and strategy planning have implications for the SISP approach, IS strategy itself, and the impact of IS strategy.

In terms of frequency, the review shows that the majority of publications related to SISP deals with the question of if and how companies can gain a competitive advantage through the application of IT. Research on SIS and the competitive use of IT has dominated the academic discussion. Of the 434 papers focusing on SISP sampled in the study, more than half (53%) concentrated on SIS and the strategic impact of IT (Figure 3, multiple answers permissible). Another quarter (27.8%) focused on the SISP approach, that is to say the procedures, methods, and frameworks employed in the course of SISP. Strategic Alignment makes up roughly another 15% of the publications.

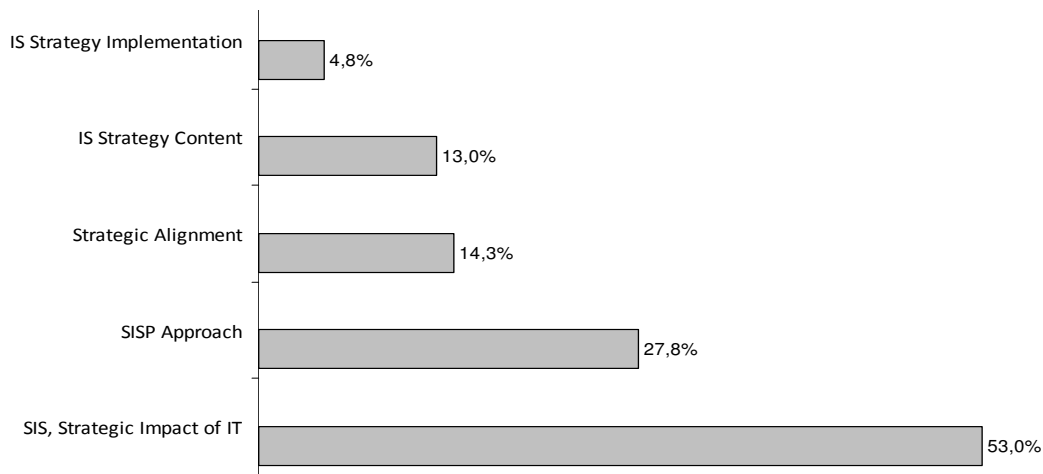


Figure 3: Share of SISP publications devoted to knowledge domains

One might expect that IS strategy, as the eventual outcome of SISP and one of the two pillars of Strategic Alignment, would also be a substantial matter of academic investigation. However, the question of what an IS strategy is and what its contents are supposed to be was an issue only in 13% of the investigated publications. This finding corresponds with the assessment by Teo and Ang (2000, p. 275) and Gottschalk (1999a/b), who also conclude that SISP research has so far mainly dealt with the planning process and less the planning outcome – the IS strategy. A literature study by Brown (2004) supports these results: The lion's share of the contributions studied (84%) deals with the IS planning process, whereas only 26% mention the IS strategy as the desired outcome (multiple answers permissible). It is this dearth of attention paid to IS strategy that leads us to take a closer look at IS strategy research in the next sections.

2 Academic research on IS strategy

The broader debate on SISP indicates that there is some agreement that application systems are at the heart of an IS strategy. Earl (2003, p. 60), for example, argues that it “is conventional wisdom and practice to think of the information systems plan as an applications development portfolio”. This view is also reflected in common definitions which define SISP as a process in which IT-based applications supporting the implementation of business plans and attainment of business goals are identified (King and Teo, 2000, Newkirk and Lederer, 2006). Some definitions also stress the necessity of prioritizing IT application projects according to economic criteria (Doherty et al., 1999). Other definitions particularly emphasize the potential of IT in creating competitive advantage. In general, many authors attached to this mindset understand SISP to be about the *planning of strategic information systems* (SIS) – as opposed to a *strategic planning of information systems* (Cavaye and Cragg, 1993). Therefore, IS strategy here acquires a primarily competitive character.

Broader definitions do not just focus on the application systems but also make technical, financial, and human resources a concern of IS strategy (O’Connor 1993, pp. 72). Baker (1995) goes even beyond that by including structures, processes, and governance mechanisms as well. For her, IS strategy incorporates the identified and prioritized IS of a business “together with the necessary resources (human, technical and financial), management of change considerations, control procedures and organizational structures needed to implement these” (Baker, 1995, p. 62).

The diversity in the interpretation of IS strategy is also evidenced by the variety of names the construct has been given. Some authors speak of “strategic information plan” (Lederer and Salmela, 1996), others use “information strategy” (Smits et al., 1997), “IS Strategy” (Galliers, 1991), IT Strategy (Gottschalk, 1999b), or a combination of both, “IS strategy” (Henderson and Venkatraman, 1993). We decided to use IS strategy here to avoid the danger of overemphasizing the technical dimension (IT) or the ultimate purpose of the use of IT (provision of information) in our analysis. Additionally, the term of IS strategy indicates that IT and information as a resource not only have to be aligned with business purposes but also need to be integrated into the organizational environment. Information systems are socio-technical systems, which bring together technical aspects of IT use and its coordination with the task-related human dimension.

2.1 IS strategy concepts

Going beyond the formal definitions, we find even less consensus on what the nature of IS strategy is and what its contents are supposed to be. However, in an analysis of 48 studies focusing on IS strategy issues, we were able to identify four different concepts of IS strategy (Teubner and Mocker, 2008): (1) *IS strategy as the use of IS to support business strategy*; (2) *IS strategy as the master plan of the IS function*; (3) *IS strategy as the shared view of, or managerial attitude towards, IT*; and (4) *IS strategy as a departmental plan for IT*.

According to Laurence and Margolis, a concept reflects the set of underlying assumptions that an author (often implicitly) derives from a specific instance of, or associates with, a specific object (Laurence and Margolis, 1999). However, a real IS strategy always reflects certain underlying assumptions about its nature (i.e. is conceptualized) and has a number of items of

content, either implicit or explicit, expressly stated or implied. Hence we will use the term ‘construct’ to refer to both the concept and contents of IS strategies. The term thus represent the complex overall nature of IS strategies.

The four views are portrayed in Table 1 according to a set of four criteria that summarize and reflect their general outlook on IS strategy. The first criterion is the core question that the conceptualization addresses (column 2). Related to this is the intended effect on the business that can be gained from devising an IS strategy (column 5). Aim and focus of the strategy formulation define its core position (column 3), which is also reflected in the relationship between IS strategy and business strategy. This relationship suggests how IS strategy should be aligned with business strategy (column 4).

Criterion Conception	Central question to be answered	Position adopted	Relation to Business Strategy	Intended effect
IS strategy as basic (managerial) disposition towards IT	What is the role of IT for our business? What is our disposition towards IT investments, IT use, and IT management?	Organization-centric Normative	IS strategy is self-contained and distinguishable from business strategy.	Establishing an organization-wide consensus on importance and use of IT as well as the role of investments
IS strategy as extended arm of business strategy	For a given business strategy, how can IT be used to support it? In particular, how can IT be used to gain and sustain a competitive business advantage?	Business-centric Competitive success oriented	IS strategy is subordinated to business strategy, it is an extension of business strategy rather than a strategy in its own right.	Creating the IT facilities necessary for the implementation of the business strategy and attainment of competitive advantages.
IS strategy as master plan	Which IT and related assets are needed across the organization? How to develop and deploy IT and related assets?	Information processing centric Build-out oriented	IS strategy is a strategy in its own right, it is deployed in alignment with business strategy	Rendering business able to do successful business
IS strategy as departmental plan	Which tasks are to be carried out by the IT function in the next planning period? Which resources are required to do so?	Department centric Strategy execution oriented	IS strategy is the implementation of business strategy on the organizational level of the IT function	Identifying required IT resources and ensuring their timely and reliable acquisition and allocation so that business can run smoothly.

Table 1: Strategy concepts in academic literature

As far as a researcher bases her or his research on one of the four conceptualizations shown in Table 1, this decision has immediate implications for the content of IS strategy:

- The concept of basic disposition (of senior management) towards IT (Chen et al., 2010, Parsons, 1983, Szyperki, 1981), for example, is closely associated with the importance of IT for the business. Generally, this notion of IS strategy is not concerned with particular decisions or planning issues, but stays on the board level. Thus, while being rather general and comparable to mission statements, the disposition has nonetheless

a discernible bearing on IS strategy contents, for instance by shaping the course of IS/IT investment decisions. Such decisions will certainly vary with whether IT is seen as a strategic factor or something with “high potential”, or merely in a supportive role in an organization (McFarlan et al., 1983).

- In contrast to the first, the conceptualization of IS strategies as departmental plans (Smits, et al., 1997, Boddy et al., 2005, p. 65, Lehner, 1993, p. 16) conceives of IS strategy in a much more detailed and concrete form on the level of the IT director. The focus here is on short or mid-term IT projects, whose implementation constitutes much of the work of IT departments. Additional duties are operational tasks and tasks surrounding the management of the IT function’s internal organization (e.g. IT service management, risk controlling, or compliance). In addition, strategic IT departmental plans are typically also concerned with deploying the requisite IT assets (e.g. personnel and financial resources) to meet these obligations.
- If IS strategy is regarded as the extended arm of the business strategy (Gottschalk, 1999a/b, Hoey, 1998, Hatten and Hatten, 1997), it is constituted directly in relation to and instrumental to the goals and measures put forth in the business strategy. This type of IS strategy is execution-oriented in that it defines the IT prerequisites for executing the business strategy. Hence, its focus is on the projects that provide these prerequisites. Such projects are called strategic IS projects in order to separate them from operational projects, which mainly result from maintenance needs. Particular attention is paid to those strategic IS projects that are directly linked to the competitive strategy of the company, as they represent the highest and most comprehensive forms of support for the business.
- In contrast, IS strategies as master plans (Henderson and Venkatraman, 1993, Galliers, 1991, Earl, 1989), are blueprints for the development of the corporate-wide IT-based infrastructure. Such blueprints are comprehensive as well as concrete. They are comprehensive because they refer to the organization as a whole and consider technical questions as well as use and application contexts. They are concrete because they determine the principles and concepts and set the course for the buildout of the corporate IT-based infrastructure. Application systems and the development portfolio are of central importance here. They are supplemented by concerns about the technical infrastructure, the information needs, and the resources to be provided. Smaller concerns are often the human resources and the formal structure of the IT function, which enables the building and maintenance of IT-based infrastructures.

The specific strategy concerns highlighted by each of the four concepts of IS strategy lead us to the question of what the contents of IS strategies are or could be.

2.2 IS strategy contents

We have demonstrated that each of the four prevalent conceptualizations of IS strategy in academia highlights specific concerns. This gives rise to the question of what the *contents* of IS strategies are or could be. Only a small portion of the discussion explicitly deals with this question. This portion makes up 13% (or 48 papers) of the overall discussion (Figure 3). These contributions can be divided broadly into checklists or issue lists, and *conceptual strategy*

models. The former are lists of more or less loosely interconnected issues to be considered in the development of an IS strategy.

2.2.1 IS strategy checklists

The checklist approach draws on literature reviews (e.g. Das et al., 1991), case studies, manager interviews (Wexelblat and Srinivasan, 1999, Pyburn, 1983, Tai and Phelps, 2000), and the analysis of deliverables from SISP methods (Lederer and Salmela, 1996). Table 2 displays three typical checklists derived by different approaches as examples.

Das et al. (1991)	Conrath et al. (1992)	Lederer and Salmela (1996)
<ul style="list-style-type: none"> ✓ 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 information technology ✓ Contribution of MIS department to systems design and development ✓ Medium, by which MIS contributes ✓ Technical processes through which MIS are managed and controlled ✓ Organizational structure of the MIS unit ✓ Administrative policies used to motivate and manage employees in MIS department 	<ul style="list-style-type: none"> ✓ Statement of objectives ✓ Hardware plan ✓ Projection of possible future MIS/EDP environment ✓ Recommended implementation plan ✓ Systems development plan ✓ Financial Plan ✓ Personnel plan ✓ Facilities plan ✓ Projection of possible future user environment ✓ Organization plan ✓ Educational plan ✓ Projection of possible future industry environment ✓ Summary of strengths and weaknesses of staff ✓ Comparison of past IS performance vs. plan ✓ Alternate strategies 	<ul style="list-style-type: none"> ✓ Summary of organization's IT strategy ✓ Data plan (initial data entities, requirements for data management) and application plan (high-level specification of apps, security and training, tools for systems development and maintenance) as well as cost, benefits, risks, and resource requirements resulting from the plans ✓ Change management plan: actions that will facilitate adoption of IS plan ✓ Human resource 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

Table 2: Comparison of IS strategy checklist examples

Strategy checklists cover a broad variety of topics. Unfortunately, the terms used in practice (e.g. IT architecture, infrastructure, IT governance) are not universally defined and are used in a great variety of interpretations. Hence, the terminology used in such checklists is far from unified and their contents therefore are very difficult to compare. For example, one term that occurs frequently on such lists is that of “architecture”. Authors use it as a reference to a model, a mechanism for shaping and controlling, or as an outline. As such, it is applied to either data, activities, technology, information systems and formalized procedures by different authors (Flynn and Hepburn, 1994, p. 214, Brady et al., 1992, p. 187, Das et al., 1991, p. 964). A related

second problem lies in the fact that even when the authors provide background for their terminology (or when at least a meaningful understanding can be gleaned from the context), there is little overlap among these definitions. Broad and abstract “Enterprise Architectures” (Wexelblat and Srinivasan, 1999) coexist alongside finely detailed architectures that refer much more narrowly to the structure of individual information systems (cf. e.g. Das et al., 1991, Lederer and Salmela, 1996).

As many checklists often hardly go beyond mere name dropping, their academic value is questionable. Another significant problem lies in the fact that the checklists lack internal structure and do not set priorities. They appear as collections of “things to be considered” and do not provide indication of strategic relevance or importance. Is “summary of strength and weaknesses of staff” really as important as “statement of objectives”?

2.2.2 IS Strategy models

Whereas checklists typically rely on inductive reasoning, conceptual models try to explore the field of IS strategy in a logically deductive fashion. Among these models, the one introduced by Earl (1989) is arguably the most prominent and influential. Since its inception, the model has undergone several updates and extensions (Earl, 1996, Earl, 2000) and has inspired several other authors in the development of their own models. Figure 4 displays Earl’s influence on the development of conceptual strategy models by way of an inheritance tree, which we have created by way of a backward citation analysis (Teubner and Mocker, 2009).

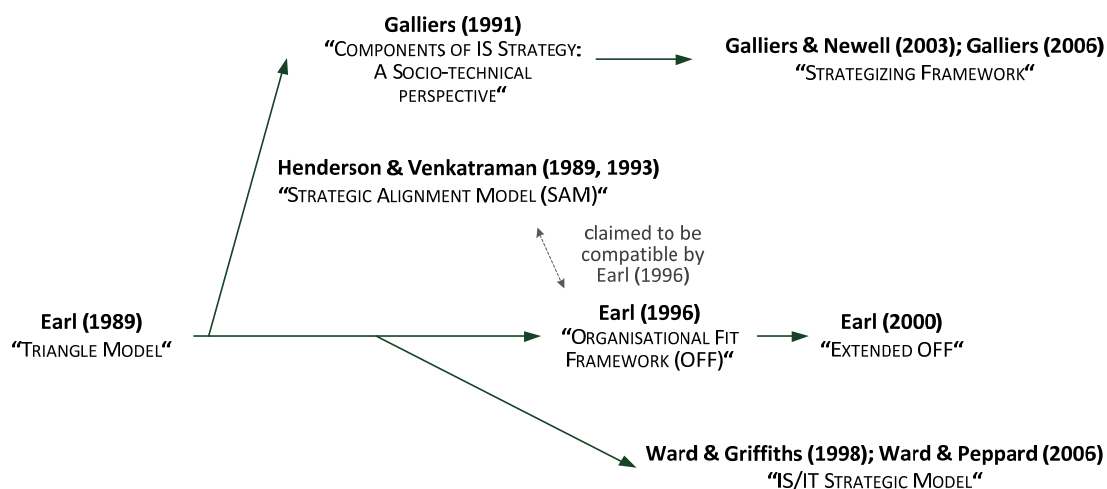


Figure 4: Genealogy of Earl’s strategy model

Earl’s model warrants our attention as it is prototypical for conceptual models in general. Three central questions have guided Earl in the development of his model: which business tasks are to be supported by IT (*what?*)? How is IT to be used to support these tasks (*how?*)? Whose responsibility, both inside and outside the organization, is the execution of these tasks (*who?*)?

In response to these questions, Earl defines three distinct dimensions of IS strategy: systems strategy, technology strategy, and management strategy: The *systems strategy* refers to the business areas that are to be supported by IT (*what?*). It consists of the application portfolio and the planned IT projects. Earl has traditionally put the systems strategy at the centre of IS

strategy as it provides the interface to the business and its processes. The systems strategy makes sure that a company's IT use is aligned with the business interests and needs. Furthermore, it ensures that IT is used efficiently by evaluating and prioritizing IT projects. The *technology strategy* in turn defines the necessary technologies and guiding principles that support and govern the implementation of the applications (how?). Finally, the *management strategy* deals with the roles and responsibilities (who?) in carrying out the tasks of the IT function (Earl, 1989, Earl, 1996).

In its latest incarnation, Earl (2000) adds a fourth dimension to his model, the information resource strategy. The *resource strategy* is characterized by the question of where in the company information as a resource adds value (where?). Information as such is seen as a valuable economic resource of its own, which Earl believes has the potential to be a key factor in business success in the information age. In particular, Earl refers to the potential leverage of a corporate-wide stock of information in the development of core capabilities and knowledge management (Earl, 2000).

In contrast to strategy checklists, conceptual strategy models have the key advantage that they structure the field of IS strategy logically in an analytical fashion. Consequently, they take an identifiable standpoint that enables them to set priorities in accordance to the logic they apply. However, this ostensible advantage is put into perspective by the decisive weaknesses associated with conceptual strategy models: First, they are normative and rely on not much more than mere common sense. Earl (1996, p. 491 and 499), for example, admits that his model is "conjectural" and not validated empirically. A study by Allen and Wilson (1996) confirms Earl's reservations by showing that his model is not immediately compatible to the actual manifestations of IS strategies in practice. Secondly, the conceptual strategy models fall victim to the same problems of consistency as the checklists. Even though there seem to be considerable intersection on level of the domains of the models (as most of them are based on Earl's model), a considerable amount of variety can be found when analyzing the concerns related to the domains in more detail (cf. Chen et al., 2010). Lastly, many of the models remain abstract in their advice and structure, which renders them quite impractical to use.

3 Contrasting IS strategy research with practice

In practice, IS strategy is an important issue that has been among the top issues on management agendas for over 15 years (Galliers et al., 1994, Watson et al., 1997, McGee et al., 2006, Luftman et al., 2011). In many large organizations, there are dedicated positions for the development of IS strategies. Typical job titles include, for example, “head of IT strategy” and “VP information management”. Regularly held summits and industry conferences (in Germany, for example, the “Hamburg strategy days” and the conference “Strategic IT-Management”), as well as dedicated columns in practitioner magazines (for example the column “IT strategy” in the “Computerwoche”, a major German practitioner magazine), provide further evidence of the attention the topic enjoys in practice.

In fact, the importance of IS strategy in practice seems to be rising even further. IT has become indispensable in many areas of business and companies are forced to invest in and use IT wisely in order to be cost effective in the face of constant competition. Growing IT costs, which consume 3-5% of revenue in information intensive industries and potentially significantly more in the finance and telecommunications industries (Potter et al., 2011), warrant special management attention. In addition, IT has intensified competition among companies, particularly in the last few years, by increasing market transparency, accelerating processes of innovation, and interconnecting supply chains all across the globe (McAfee and Brynjolfsson, 2008). In fact, IT has even fundamentally transformed the nature of doing business in many industries through dis-/intermediation, inter-organizational networks, or creating tightly interwoven business ecologies (Picot et al., 2008). It is thus ultimately not surprising that the strategic importance ascribed to IT in practice, while already being high, has gone up even more (ITGI, 2008, ITGI, 2011).

The growing interest in IS strategy in practice is contrasted by a corresponding decline in academia. This apparent discrepancy could be resolved easily if the domains of SISP and IS strategy had been sufficiently researched in the intervening period and it was only the proper transfer of knowledge to practice that was still missing. On the surface, this conclusion would even agree with the empirical observation that IT practitioners take hardly any notice at all of academic publications in this area (Mocker and Teubner, 2006).

Alas, the general lack of relevance of academic efforts on SISP and IS strategy in practice cannot be explained so easily. As a matter of fact, there is ample evidence that the academic discussion is busy debating issues different from those that are given priority by IS strategy practitioners (Brady et al., 1992, p. 183). A quick look at the contents of practitioner magazines suffices to illustrate this. Two thirds of the topics discussed in 2009/10 under the label “IS strategy” in the “CIO Magazine” and the German “Computerwoche” deal with new technologies (e. g. Cloud Computing, Service Oriented Architecture, Software as a Service, Web 2.0) or application trends (e. g. Customer Relationship Management, Social Software, Business Intelligence). Another 10% of articles deal with IT governance and IT outsourcing. Smaller shares are made up by further topics such as technology and process standards and IT security.

Our assumption that there is in fact a discrepancy between IS strategy research and practice is mirrored in an in-depth case study of a financial service organization (Teubner and Mocker, 2005, Teubner, 2007). Based on this study, Mocker (2007) investigated the contents of IS strategy in practice in a bottom-up, explorative way by conducting in-depth interviews with IS

strategy experts in practice. The experts came from 12 mid-sized companies and large corporations from the private and public sector headquartered in the German speaking parts of Europe. A qualitative analysis of this interview data further substantiated our assumption that the academic discussion had lost touch with practical reality (cf. Mocker, Teubner, 2006, Teubner, 2007, Teubner et al., 2009). An additional in-depth analysis of the interview data (Teubner et al., 2012) yielded a more detailed picture of practitioners concerns in IS strategy as opposed to academic concerns. In the visualization of the study’s findings in Figure 5, the upper dark red area depicts strategy concerns that are in the focus of the academic debate, while the lower light blue part depicts those concerns that IS strategy professionals’ thinking centers on. The non-overlapping areas visualize gaps between academia and practice, which we will discuss in the following.

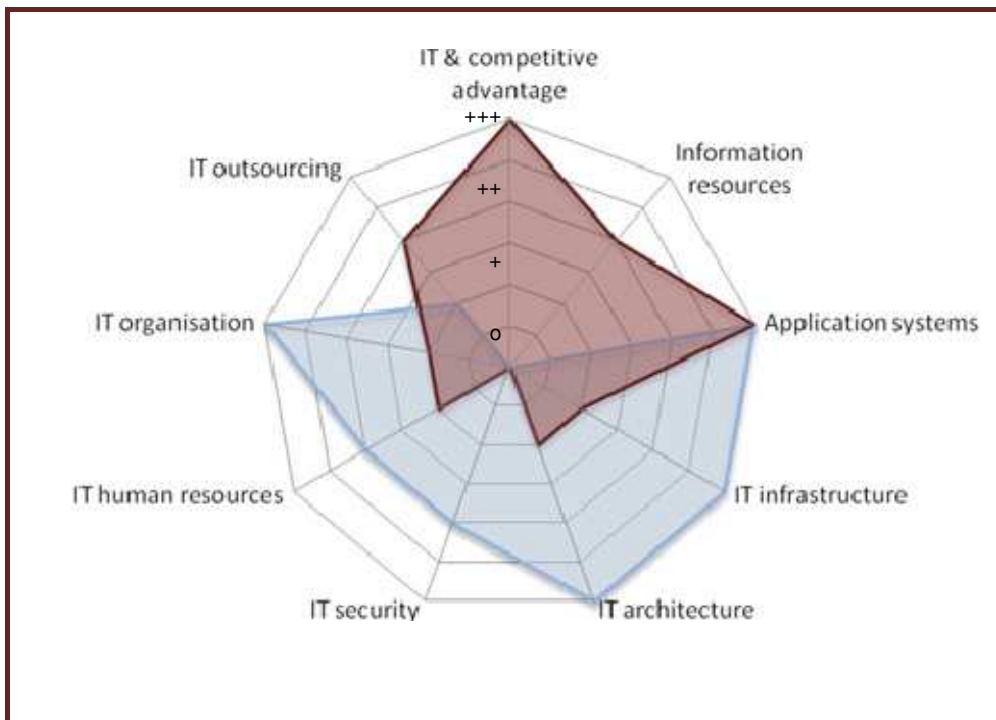


Figure 5: IT strategy concerns in academia vs. professional practice

We are cognizant that the study draws a comparison between more than 30 years of dedicated SISP research and a snapshot examination of practitioners’ concerns in the first decade of the 21st century. We believe that this comparison is valuable and valid despite the great differences in scope because the textbooks and practical guidelines on SISP that are available to practitioners today represent a condensed form of the outcomes of this research.

The academic perspective

Looking at the gaps from the viewpoint of academia, the most striking difference to professional practice is the attention paid to SIS and competitive use of IT. The competitive potential of IT and its applications clearly dominates the academic discussion (cf. Section 1 and Figure 1), whereas the study found that it was hardly a concern in the diverse companies interviewed. Rather than thinking about how to employ IT proactively to move the business ahead strategically, the IS strategy agendas were largely developed in the spirit of providing optimal support to existing business strategies. Though many interviewees were completely caught up

in that mindset, all interviewees had an eye on the general adaptability of the IT-based infrastructure to potential future needs.

The study found there to be more agreement in regard to application systems. They were a strategic concern in $\frac{3}{4}$ of all cases, which somewhat mirrored the academic interest in the topic. An important distinction, however, was that only a minority of practitioners also highlighted the role of the application portfolio as an interface to the business to be planned and developed strategically. In most cases, new applications were planned on a project-by-project basis only. In these cases, the decisions were made without an overall investment portfolio for information systems development, but relied on simple supply and demand mechanisms between business units and IT. Overall, the practitioners' primary interest regarding applications was how to best support new business needs with new applications while keeping certain limits of efficiency and maintainability. The portfolio of development projects was only a secondary concern.

The perspective of practice

Up to now, the concerns of most interest to IT professionals, apart from IT applications, have been addressed inadequately by IS strategy research. Practice's major concerns are the standardization and efficient provision of applications as well as the technical infrastructures on which they are based. The guiding concept behind these concerns is that of IT architecture which includes the principles, guidelines, standards and patterns to follow when developing an IT-based infrastructure. As a consequence, organizing the IT function is also in the focus of practitioners since the IT function provides the human resources and structure for building and running the IT-based infrastructure. Related to the issue of IT organization are concerns of rights and accountability for IT-decisions. These are typically considered strategic issues by IT professionals because they provide the playing field and set the ground rules for how IT and business interact and how IT decisions are made across the whole organization. As such, they are seldom confined to the IT domain alone but concern the entire business. Finally, IT security is an important concern across all areas of IS strategy in practice, though there are differences in form and formal role. In the case of a bank, a loss of data or outside access to confidential information can lead to an immediate shutdown of the whole business. Accordingly, IT security is a top priority concern of its own in the bank's IS strategy. In other organizations, IT security is perhaps less visible because it is an integrated part of other strategic planning concerns such as the planning of networks and technical infrastructure, standardization or human resources. However, even in these cases IT security is part of IS strategy. Nonetheless, IT security is a critical part of IS strategy in these organizations too.

Reasons for differences in the perspectives

One root cause for the distinct perspectives researchers and practitioners take on IS strategy seems to lie in the timeliness of the academic literature and the topics it addresses. As depicted in Figure 1, the bulk of research on IS strategy was done and published in the late 1980s and throughout the 1990s. Given the pace of advances in IT, it is not surprising that many of the topics that matter to IT professionals today are not among those covered by this research. Interestingly, several of the issues that do interest practitioners today have been researched quite extensively, albeit not as part of the IS strategy debate. We can for example find dedicated research on enterprise and IT architecture (Aerts et al., 2004, Ross, 2004, Tamm et al., 2011) and on the characteristics of effective IT infrastructures (Weill and Broadbent, 1998, Kayworth et al., 2001). This research loosely refers to IS strategy (see for example Hay and Munoz, 1997,

Weill et al., 2002), but has not been fully absorbed by, and integrated into, the academic debate on IS strategy so far. Accordingly, neither the status of IT architecture and infrastructure within IT strategies nor their relation to other planning areas such as strategic information systems or strategic information resources have been satisfyingly resolved so far. The situation is similar in regard to IT security. There is dedicated research on IT risks and on the means available to provide IT security, but this research is mostly technical and often operational in focus. As far as IS strategy is concerned, the topic is largely excluded from the debate (cf. Doherty and Fulford, 2006).

A second important reason for the discrepancy between IS strategy research and practice are the distinct organizational assumptions underlying researchers and practitioners perceptions of IS strategy. We have found that whereas academic research usually studies IS strategy in a single business entity context, practitioners often take a corporate view that has to accommodate several individual business entities at once (Teubner et al., 2012, p. 31). Such strategies do not regularly aim at supporting individual products or processes but at realizing synergies across several business units. Therefore, topics such as corporate-wide systems standardization or the development of common IT infrastructures preponderate, whereas they have only been given limited care in the academic discussion so far.

Strategy Level	Relevance in practice	Academic interest
Corporate level	++	0
Business (unit) level	++	+++
Functional level	+	++

Table 3: IT strategy perspectives in academia and professional practice

Against this backdrop of divergence between academia and practice, it does not seem surprising that Brown (2010) found significant differences between academic debate and practitioners' IS strategy theories in both espoused theories and theories in use. In addition, practitioners seem to pay little heed to the academic discussion. This is evident by the fact that practitioners hardly use or even know academic literature on IS strategy (Teubner and Mocker, 2005, Teubner, 2007, Mocker and Teubner, 2006). Allen and Wilson (1996, p. 240) see an additional problem in a lack of consensus on academic theories as well as in an inconsistent use of language that makes it difficult for practitioners to derive conclusive suggestions from academic literature. This observation is also supported by interview data (Teubner et al., 2009, pp. 406), which show that practitioners complain that literature on IS strategy is too abstract and detached from real world concerns and therefore of little practical use.

4 Conclusions and recommendations for research

To conclude, in more than 30 years of research, the academic discussion on SISP has given rise to a variety of different IS strategy concepts and contents. During all of this time, academia has neglected to build strong ties to the practical reality of IS strategy, which manifests in the sheer variety of approaches and proposals itself – some of which are mutually exclusive and incompatible – as well as the obvious lack of acceptance of the academic propositions in practice. Academia and practice are in a mutual state of ignorance and talking past each other. This situation is unbearable given the importance that IS strategy has in practice. Yet, its importance is bound to grow even further in the future because, firstly, considerations of effectiveness and cost efficiency of IT use will become even more important as IT continues to spread into more and more business areas. Secondly, the global adoption of IT in private as well as business life has the potential of transforming the foundations of economic production. Novel business models, as well as new forms of organization and cooperation, emerge across and within companies. This poses not only new challenges, but also new opportunities that businesses need to identify and on which they need to capitalize.

Given the shortcoming of present IS strategy research, in our opinion there is a substantial need for a re-invigoration and re-imagination of research on IS strategy. Hence, in this section, we have formulated four propositions that address the gap between theory and practice and identify promising paths for an empirically substantiated IS strategy research:

- *Strategy over Strategizing*: This proposition emphasizes the importance of a clear understanding of the nature and contents of IS strategy for the future of research on SISP. Strategy needs to be understood before strategy development can set in.
- *Strategy in Vivo over Strategy in Vitro*: This proposition refers to the dominance of concept and framework-based approaches to IS strategy in SISP research. Based on the observation that many of these concepts and frameworks have been built on theoretical premises that are problematic and hardly recognized in practice, we call for a reorientation of research towards an approach with strong links to practice that has much more foundation in what happens on the shop floor.
- *Empiricism over Idealism*: We believe that practical research needs to be firmly based on empirical observation. In light of the disparate state of the field, we believe this base to be less in large-scale, narrowly-focused and hypothesis-driven studies than in data-driven and explorative investigations that bear the potential of bringing forth novel theories that rest on a firm empirical foundation.
- *Sustainability over Competitiveness*: This proposition refers to the fact that up to now research has overemphasized issues of competitive use of IT, while it has neglected questions of efficiency, serviceability, and adaptability of the IT-based infrastructure. In light of the observation that precisely these are the questions that trouble practitioners, we believe that the priorities in research on IS strategy contents warrant a second look.

The four propositions move from the general to the particular. The first one is the most fundamental as it explains the benefits for SISP research that accrue from a better understanding of the IS strategy construct. The second and third propositions refer to the questions of how and with which goals IS strategy should be researched productively. The

fourth proposition is less programmatic than it is a recommendation on which broad themes future IS strategy research should focus on. We argue that our four propositions provide a framework for IS strategy research that effectively addresses and overcomes the deficits spelled out previously. Thus, it helps to lay the foundation for developing a far more substantial and well-rounded understanding of what an “IS strategy” is.

4.1 Strategy over Strategizing

In brief, with our first proposition we suggest that the SISP discourse needs to shift research efforts away from IS strategy planning processes, approaches, and methods to the construct of IS strategy itself. We believe that only by gaining a better grasp of *what* we are talking about – the IS strategy – can we begin to develop a coherent and sound understanding of *how* we are going to plan for it, i.e. what successful approaches to SISP should look like. Hence, we are convinced that more research on IS strategy will have great benefits for the larger debate on SISP.

Given its central importance, we will elaborate on this proposition in some depth. We start by the introducing the traditional planning paradigm in more detail and proceed by confronting it with the paradigm of “Strategizing” that has drawn increasing attention in the last years and signifies a paradigm shift that emphasizes the emergent nature of strategy formation (section 4.1.1). However, beyond the substantial differences between these two paradigms and irrespective of the superiority of one over the other, we demonstrate that a better understanding of IS strategy is highly beneficial in both cases (section 4.1.2).

4.1.1 Strategizing – reframing SISP

Early SISP in the 1970s was based on what we might call a traditional planning paradigm that emphasized rational analysis and formalization as two of its central elements. According to this paradigm, planning is about predetermining future action accurately and comprehensively, the planning outcomes are to be recorded formally in plans. Good strategies in this context require accurate predictions about future environmental developments, which in turn require careful analysis of an organization and its environment (e.g. in the form of a SWOT analysis), usually aided by special planning techniques (e.g. portfolio or scenario methods). This traditional understanding, however, has come under criticism in recent history for three main reasons:

- First, it has become apparent that the results of SISP research have only limited relevance in practice. Empirical studies show that the practices of how SISP is actually carried out in companies have little in common with the academic proposals on SISP that rely on certain models and suggest specific methods (Brown, 2008). In addition, there is evidence that practitioners consider academic suggestions irrelevant and hence consciously ignore them (see Section 2.2).
- The lack of practical relevance is also inherent to the second argument that has been leveled against the traditional SISP view. This argument questions the validity of some of the central premises on which SISP research is based. Hackney et al. (2000), for example, question the long cherished assumption of SISP research that IT has to be seen in terms of its capacity to generate competitive advantage. However, this premise

and the related concept of Strategic Information Systems have been central to the academic debate on SISP. In the same paper, the authors also doubt that businesses are capable of formulating (formal) business strategies to which IS strategies could be aligned. This challenge in turn deprives the research on Strategic Alignment, which is another key element of the academic debate (cf. Figure 1), of all foundation.

- The third argument relates to changing environmental conditions that are seen to have invalidated a number of the key assumptions underlying traditional SISP research. Whereas the assumption of relatively stable environments could be upheld until late in the 1980s, this assumption's validity has crumbled more and more since the 1990s. Critics state that growing environmental complexity (e.g. in the form of globalised markets and competition) and ever more turbulent and dynamic change (e.g. in the form of the transformation of industry structures and shorter innovation cycles) that are a hallmark of the information society make it much harder for traditional methods of formal analysis and planning to produce effective outcomes. Instead, planning is increasingly painted as an emergent phenomenon conditioned by coincidental events and spontaneous processes (Galliers, 2011). Most importantly, however, planning is regarded as a continuous process whose outputs need constant evaluation and revision.

Amongst the most outspoken critics of traditional SISP is Robert Galliers. He concludes from his observations of how quickly and unpredictably environmental conditions change in today's world that SISP research is in need of a new direction. In his view, SISP research should concentrate not only on formal processes of IS strategy development, but also consider the *informal* ones that he sees as having been neglected until now (Galliers and Newell, 2003, Galliers, 2006, Galliers, 2011). In order for this change in thinking also to find its way into writing, he uses the term of *Strategizing*, which is free from the connotations of rational analysis and formalization that have historically burdened the designation of "SISP".

Robert Galliers uses the term "strategizing" in a programmatic way pursuing two distinct aims. First, he re-emphasizes an activity-centric view of strategy development. In this regard, Galliers remains true to the traditional focus in SISP research where the process is the central concern in SISP. But secondly, he also proclaims a shift from the formal to the informal and from the planned to the emergent dimensions, which puts strategizing in direct contrast to the traditional planning paradigm. He holds that in the new environmental conditions that exist today companies need to include the possibility of open-ended tinkering, improvisation, and spontaneous innovation in their IS strategy planning processes (Galliers, 2011, p. 336). He does not fundamentally question a company's ability to develop IS strategies, but he considers the forms of traditional planning that may have proved useful in the 1970s and 80s severely challenged in the reality of the 21st century.

Galliers' view is echoed in – and borrows from – the broader academic debate on business strategy which also encountered problems with the more formal approaches to the development of business strategies. A turning point in strategy research is marked by the well-known controversy between Henry Mintzberg (Mintzberg 1994) and Igor Ansoff (Ansoff, 1994) over the nature of strategy development, which gave rise to a shift towards the more informal processes in strategy development. This shift made some researchers take more interest in the actions of the human actors involved in business strategy development. This new activity-based stream of research, for which the term "strategizing" was coined, focused on the day-to-day and micro

activities (Whittington 1996; Johnson, Melin and Whittington 2003). Proponents of this stream of research hold that with its focus on the actual activities of strategists in practice, strategizing research will lead to more relevant findings. Accordingly, this reorientation in business strategy research has also been characterised as a “practice turn” (Whittington 2006; Jarzabkowski, Balogun and Seidl 2007).

As a result of this shift, SISP has in fact gradually moved away from the assumptions of the traditional planning paradigm and has come to be regarded mainly as a combined learning and decision process that creates awareness of, and fosters, a better general understanding of the potentials and limits of IT use in organizations (Salmela and Spil, 2002, Segars and Grover, 1999, Auer and Reponen, 1997).

Similar to the developments in academia, practice has also long since departed from the view of SISP as an instrument exclusively used to structure and predetermine future action based on sound analysis. Practitioners have become aware of the significance of SISP as a tool for facilitating communication about, and reaching a consensus on, IS strategy and its future direction (Clark et al., 2000). This increase in communication and consensus finding, for example, has been shown to substantially alleviate implementation problems, which are often stated against the effectiveness of SISP (Hartono et al., 2003). In all this it is important to note that SISP as a process of learning, communication, and consensus-finding will yield preliminary results that are always subject to revision.

Unsurprisingly, all of these changes in strategic IS planning processes have not been without effect on the understanding of IS strategy itself. Even though a consensus reached during the planning process will often be recorded in some kind of formal document – for example an architecture blueprint, an application development plan, or an IT vision statement – IS strategies tend less to be fully devised up front but to emerge on the way. We can also observe that IS strategies, even if formally put in writing, are often only partially implemented (Lederer and Mendelow, 1993, p. 320) because – among other factors (Hartono et al., 2003, Teo and Ang, 2000, pp. 467, Gottschalk, 1999a/b) – environmental uncertainty and environmental flux have rendered them obsolete even before the implementation stage is reached (Wilson, 1991, Lederer and Mendelow, 1993). More and more IS strategies come under question even before they are printed.

All in all, the situation seems clear: under the impression of global competition, drastically shortened product life cycles, and rapidly changing customer demands, SISP has become a tentative, careful step-by-step undertaking allowing for tinkering and emphasizing learning with no clear goals and unambiguous truths. Or, as Galliers (2006, p. 11) puts it: “we should not lament fragmentation, provisionality, or incoherence, but rather take it as given. If we can’t predict the future, we should not pretend that we can“. Consequently, IS strategy as the documented outcome of SISP has lost all air of finality and being something definite to orientate by, rely, and build up on.

However, this radical view that almost seems to put a post-modernist spin on strategy making with its stress on the informal, fragmentary, and provisional is also in danger of overshooting the mark. For example, the hypothesis that a comprehensive and systematic SISP reaches its limits in the highly turbulent and rapidly progressing competitive environments of today has been thoroughly challenged (Chi et al., 2005, Newkirk et al., 2003, Hartono et al., 2003, Teo and Ang, 2000). On the contrary, it could be shown that even in turbulent environments a systematic and

comprehensive SISP is sometimes superior to an incremental approach (Salmela et al., 2000). In addition, adaptive forms of SISP based on rational analysis and planning have proved effective (Segars and Grover, 1999). This holds especially true in turbulent environments. Grover and Segars (2005) show that with increasing environmental complexity, systematic forms of SISP are successfully extended and not reduced. So where do these considerations leave IS strategy? Does it mean that IS strategy as a systematically thought through concept with clear contents is not outmoded after all? Newkirk and Lederer (2006), for example, find that the two early stages of determining contents and implementation are the stages of SISP with greatest importance for its success. The latter finding supports the view that structure and content of IS strategy do matter after all.

4.1.2 Re-establishing SISP – putting IS strategy first

On the whole, we are witness to a disparate academic discussion about SISP, where multiple parties take different, sometimes opposing views and no unanimous results emerge, while practice looks on with polite disinterest. We therefore believe that for the SISP debate to become productive and relevant again there needs to be a shift of focus. We postulate first and foremost that the SISP discourse needs – at least for the time being – to shift its research focus from the processes, approaches, and methods of IS planning to the *construct of IS strategy itself*. This proposition might appear obvious in view of the fact that research on IS strategy has so far not constituted a big share of research on SISP (Figure 3). Yet our demand goes beyond a mere relative increase in research efforts. Yes, we do believe that the call for focusing on IS strategy in SISP research also has a quantitative element – we need more research. But we also believe that along with a heightened intensity of research on IS strategy there should come a shift in quality as well. This new quality refers to a better understanding of the IS strategy construct, its foundation in practice, the link to strategy theory in general, the role of contents, the setting of IS strategy priorities, and the research methodology. We believe that if researchers pay attention to these aspects, research on IS strategy has the potential to advance the state of knowledge in research of SISP on the whole.

The reason for our assessment lies in our viewpoint that dealing with the *what* of SISP – i. e. the IS strategy, its nature and contents – should precede a debate on *how* such a strategy should be developed. We hold that the tasks and processes of IS strategy development can hardly be gauged reliably and supported effectively if the underlying construct is unclear. This argument is not only intuitive, but also underlies the traditional literature on SISP that advances the view of SISP as a goal-oriented and systematic process. But even if one subscribes to the understanding of SISP as an emergent phenomenon, i. e. strategizing (e. g. Galliers, 2011), the clarification of the nature and contents of IS strategy is no less important.

Firstly, developing a clear understanding of the construct of “IS strategy” and what it contains is important because without such an understanding it is hard to distinguish SISP from other organizational processes involving learning and communication. The traditional planning paradigm largely made do without an explicit IS strategy construct. For the traditional planners, IS strategy was merely the functional result of the planning process they went through. In regard to strategizing, we feel that a good deal of the emphasis on learning, emergence, and provisionality is only a surface expression of a deeper-seated uncertainty about the subject matter. It holds for both views that if we do not know what SISP is about, how can we distinguish it from any other process of organizational communication? Only once the distinctive

characteristics of IS strategy development vis-à-vis other organizational processes involving information, communication, and learning are clear, it is possible to support strategizing productively and precisely. And the distinctiveness of SISP lies in its subject matter, the nature and contents of IS strategy. In addition, only once such contents as “IT architecture” or “IT governance” are fundamentally understood in their strategic relevance can one appreciate their distinctive characteristics and the special requirements they impose on the IS strategy development processes, may they be formal or emergent. Only with such an understanding will it be possible to conceive and delineate the differences between e. g. planning the IT architecture and establishing the IT organization and its governance mechanisms.

Secondly, the existing debate on SISP and IS strategy has shown that the other way round – processes first, essence and contents later – has led to a hodgepodge of definitions, approaches and results that have not been conducive to create a consistent picture of IS strategy and strategy formation that is accepted in practice. But it is essential to see that consistency, clarity, and acceptance in practice can only result from consistency and clarity in academia. This is of even more importance as we could show in an earlier study that practice also exhibits a manifest lack of unity regarding the nature of IS strategy and the design of the SISP process (Mocker and Teubner, 2006). Although the study revealed certain common IS strategy patterns such as IS strategy as a binding guideline, a change agenda, a departmental plan, or the outside image of the IT department, these patterns were not very strongly developed among the IS strategy professionals we interviewed. Also regarding how IS strategy is formed, we found that each company followed its very own procedures, ranging from the meticulously defined step by step approach to a kind of case by case improvisation.

Given that the IS discipline as an applied science accepts the challenge of offering practical help to managers, developing a clear understanding of IS strategy seems to be a worthwhile goal as it helps practitioners to become aware of these differences and their respective characteristics, constraints and repercussions, which in turn allows them to untangle their SISP processes and ultimately make better informed decisions.

4.2 Strategy in vivo over strategy in vitro

In order to arrive at a sound understanding of IS strategy itself, we propose to concentrate research attention on IS strategy practice in the first instance. This measure ensures that IS strategy research is firmly rooted in reality (“in vivo”). We believe that one of the main shortcomings of IS strategy research hitherto is that it has relied too much on conceptual models devised by researchers that might provide some analytical clarity and logical underpinning, but that are removed from practical experience (“in vitro”).

There are first and foremost the planning methods that constitute the core of many of the traditional SISP research of the 1980s and 90s. These methods see strategic planning as a systematic process of constructing integrated models that range from strategic concerns at the top to the individual information system at the bottom (Boyton and Zmud, 1987, Henderson and Sinfonis, 1988). These approaches are burdened by their basic assumption that organizational reality can be adequately captured in formal models that themselves subsequently serve as a foundation for a systematic and method-supported process of planning and developing information systems. Paradigmatic examples for this thinking are the information engineering method (Martin, 1989, Finkelstein, 1992, Teubner, 2003) and the Zachman framework

(Zachman, 1987) that to this day exert a considerable influence on IS research, for instance in the area of Enterprise Architecture (Aier and Winter, 2008). We would agree with Galliers (2011), however, that the assumption that organizational reality can be adequately grasped by formal planning models has to be rejected as unrealistic, particularly on the strategic level. Moreover, it is neither possible to fully capture organizational reality in formal models (goal system, organizational structure, information need, etc.), nor can these models be expected to be stable enough to suggest dependable courses of action if they are not based on, and a result of, meticulous and conscientious practice-oriented empirical research (Hackney et al., 2000, p. 7).

Secondly, there are also numerous formal frameworks that have informed academic thinking about SISP. Prominent among them are, for instance, Porters five forces and value chain (Porter and Millar, 1985), McFarlan's portfolio model (1984), and models from game theory (Bakos and Treacy, 1986, Zhu and Weyant, 2003). However, it has been questioned whether the assumptions underlying these frameworks are applicable (Hackney et al., 2000). Such frameworks are mostly based on theoretical assumptions from which they derive their suggestions by logical reasoning. This angle of approach to IS strategy, unfortunately, often seems to miss the problems that matter in practice, which in turn leads to a lack of practical acceptance. Practitioners simply do not use Porter's five forces model in their IS strategic considerations.

Our conviction concerning the dominance of "in vitro" research finds support in a study by Brown (2004), which analyses the purposes pursued in traditional SISP research. According to this study, the main purposes are methods development and hypothesis testing, which together account for 55 % of all studies investigated. Studies making conceptual contributions (6 %), developing theoretical constructs (9%) or making (normative) prescriptions for SISP (7 %) account for another 22% of research done. In line with these purposes, the majority of the research is dominated by survey methods (43%) while another portion is argumentative and conceptual (14%). Case study research also accounts for a significant part of research (43 %) but the majority of studies apply predefined theoretical constructs rather than using open methods to capture IS strategy praxis. Action research, for example, is only applied in 4% of the studies.

In sum, the drawbacks of a mainly theoretically and conceptually driven approach to researching IS strategy ("Strategy in vitro") have led us to call for a fundamentally more practice-oriented approach ("Strategy in vivo"). This proposition has three aspects:

- First and foremost, we consider it necessary that new research on IS strategy does not see only theoretical or conceptual considerations but also strategy practice as a springboard for its deliberations and analyses. IS strategy research should be conducted much more in collaboration with practice. Doing so will not only increase the quality of research but can also help overcome the lack of practical acceptance.
- We propose, secondly, that research should try to generate much more practically usable results than has been hitherto the case. Until today, research has hardly produced any rigorous and actionable management advice. For instance, it is telling for the present state of IS strategy research that there is not a single IS strategy content checklist available today that would help managers launch an informed organizational debate about IS strategy.

- Thirdly, not only do we need more practically usable results but also short feedback loops between academic research and practical application. This opens up new possibilities for evaluation and validation of findings and the recommendations derived therefrom. It also enables researchers to develop a better sense of the topics and issues discussed in practice and the resulting challenges.

One way for researchers to attain closer relations between academic research and professional practice is to study and interact with communities of practice. Such “practice theories” have found a growing audience of late (Feldman and Orlikowski, 2011). Practice theory assumes that social reality is the product of constantly ongoing and recurrent human action and interaction. Special emphasis is put on the role of human action and its significance for the attainment of organizational goals. Action in practice theory encompasses both formalized and routinely repeated actions but also improvised or spontaneous ones. By including spontaneous and improvised actions in its considerations, practice theory is particularly well suited to conditions of uncertainty, high complexity, fragmentation, and dynamism. Therefore, it plays to its strengths whenever research employing conceptual frameworks such as the value chain, five forces etc. to explain and guide action comes to its limits (Child and McGrath, 2001).

Generally speaking, practice theory’s main interest is in explaining practical action. If we adapt this basic idea to research on IS strategy, the following questions arise:

- What do practitioners mean by IS strategy?
- Why do practitioners devise IS strategies? What use do they see in that?
- Which issues do practitioners regard as strategic?
- What are the contents of IS strategies in practice?
- What are reasons for regarding certain IS issues as strategic?
- What are valid rationales for looking upon an IS issue as strategic?

We believe that these questions are fruitful for the IS strategy debate because they allow us to better understand the role of IS strategy in practice under the conditions of the information age. We are convinced that, by asking these questions, academics can gather valuable input for research about IS strategy contents and for the development of strategy theories and models that pay heed to the rationales underlying practical IS strategy thinking.

4.3 Empiricism over idealism

In this section, we want to emphasize a point that we have already touched on in our call for IS strategy research “in vivo”: the need for more empirical grounding in IS strategy research. This need does not stem from a lack of quantity, there have been several bigger empirical studies on the SISP process, e.g. by Earl (1993), Sabherwal and King (1995), and King and Teo (2000), in addition to those already mentioned. Rather, we see the problem with empirical research in the role that it plays in the research process. By and large, research on SISP starts with theory-guided conceptual models from which testable hypotheses are derived, which are then typically validated in large-scale empirical confirmation trials. Despite the use of empirical research we consider this approach “idealistic” in the sense that ideas (concepts, models, frameworks) stand at its beginning. The empirical part of research is used only to confirm or reject these ideas in a second stage. In contrast to this, we demand strongly “grounded” research investigates problems raised by practitioners’ actual concerns and that includes practitioners closely in the

research process. This inclusion can happen by validating preliminary research results through repeatedly feeding them back to practice. Another way to be close to practice is engaging in forms of action research where results emerge in close collaboration between researcher and the research object (Frank et al., 1998).

Our proposition can also be framed in terms of the distinction made in literature between *confirmatory* and *exploratory* research (Tukey, 1980). Confirmatory research in the social sciences is based on the notion that there is a research field that is so well understood that its essential characteristics can be described and certain key phenomena identified and named. Knowledge about this field can be extended by formulating and testing empirically relatively precise hypotheses relating to its characteristics and the occurring phenomena. In other words, there is the presumption that a researcher has a reasonable idea about the outcome of a study, which outcome he phrases as a research hypothesis that is then empirically confirmed. In contrast to this, explorative research aims at establishing a first and tentative basis of knowledge in a research area that is as yet little understood. This is particularly the case if important phenomena are unknown and only vague ideas exist about the basic relationships among the active forces in that area. In other words, a new or little understood area of research is *explored*.

Our demand for more explorative research might seem surprising considering the more than 30 year long history of research on SISP. This being the case, our demand must not be mistaken to mean that all research on SISP has to be completely discarded and rebooted. It is only that in our opinion the parts of SISP research that have received most attention so far have been greatly overemphasized at the expense of IS strategy, which is hardly understood but is at least as important. This is largely due to a decades-long pre-eminence of a thinking tradition in SISP research that places the most importance on the process and how it can be formally and systematically designed. Only now, with the recognition that there also is an informal and emergent side to SISP – something which the notion of “Strategizing” has only lately come to accentuate – does it become clear how important, in the absence of any of the old clarity and unambiguity, a sound grasp of the subject matter of SISP has become.

Whether our assumption that SISP research has set the wrong priorities is correct or not, we can say for certain that a considerable gap has developed between SISP research and practice. As long as this gap is not closed, researchers run the risk of concerning themselves with topics and concepts that are far removed from the actual problems that matter in practice. Not only is confirmatory research in these circumstances at risk of asking questions that are based on wrong premises, it might also produce misleading results because the premises and the resulting questions are interpreted quite differently by the practitioners at whom they are directed. These problems are particularly severe in research on IS strategy. As long as “IT architecture” can mean all things to all people, valid research will already fail at the semantic stage. The precision and clarity of expression of a standardized questionnaire, which in some research settings counts among its greatest virtues, becomes a millstone around the neck of IS strategy research. For instance, up to 85% of practitioners, when asked in a confirmatory questionnaire, will say that they have an IS strategy in their company (Krüger and Pfeiffer, 1991, p. 34, Lehner, 1993, Wöll, 2002 pp. 4). At the same time, our aforementioned study into the phenomenon of IS strategy in professional practice (Teubner et al., 2009) revealed by virtue of its qualitative and explorative approach that practice itself is far from a common understanding of IS strategy. If practitioners are asked to provide their understanding of IS strategy and its constitutive elements in their own words, it comes to light that sometimes their understanding is

so fuzzy that they have difficulties putting their thoughts into words. For any researcher, this means they should question the deeper significance of a practitioner checking “yes” on a questionnaire asking whether an IS strategy is in place.

In sum, we consider the construct of IS strategy as not sufficiently clarified and empirically substantiated enough to turn it into a research problem that can reasonably be tackled by confirmatory research. Rather, we suggest conducting extensive exploratory research, which in the long run may be able to provide the kind of foundation that is necessary for confirmatory research, setting in at a subsequent stage of a more mature level of insight. In a first step, qualitative research approaches seem appropriate to provide a fresh and unbiased look at the construct of IS strategy practice.

4.4 Sustainability over competitiveness

We hope to obtain not only valid and relevant, but also applicable and “actionable” results from practice oriented research that is guided first and foremost by rich empirical data. However, we are well aware of the high demands of, and strains on, time and resources connected to such an approach. Therefore, our last proposition is more of a recommendation of which content areas to focus on rather than a strict requirement.

We have demonstrated that how to attain a competitive advantage has been the major subject of interest in research to date. In comparison with practice, however, it turns out that the importance of this subject has been grossly overstated (Figure 3). Instead, such issues as ensuring continuous service provision and general concerns about technology, its standardization, and the choice of vendors are much more real to IT practitioners. This fact cannot be attributed solely to an overly technical orientation of practitioners or cultural peculiarities of “IT people”, even more so as many practitioners come from a business background. Apart from an ostensible penchant for technology on the part of IT professionals, there are also other reasons for this apparent technological bias that are much more fundamental and ultimately more convincing.

First of all, as Teece et al (1997) have demonstrated, competitive advantage is in constant danger of erosion in the hypercompetitive conditions of modern information economies. By the same token, business requirements of today are liable to change so quickly that it often does not seem reasonable to put a lot of energy and dedication into carefully anticipating and planning long-term application needs. Instead, adaptive and flexible yet technologically sound IT infrastructures are seen as the key to success as they allow swift realignment to changing business needs. Hence, we are convinced of the value of a flexible technical infrastructure which allows for quick adjustments to changing information needs and business requirements on the application level (Teubner, Pellengahr and Mocker 2012, p. 35). At the same time, such an infrastructure needs to be cost effective and provide both stability and reliability. This leads us to support Booth and Philip (2005, p. 401, see also Phillip, 2007) who recommend that “organizations should recognize that planning for operational efficiency can often bring as many (or perhaps more) benefits as planning for strategic advantage”. We second this proposition but would even go one step further by demanding that IS strategy should not only be concerned with the operational efficiency of the IT-based infrastructure but also its sustainability and flexibility. Accordingly, we look upon standardization, modularization, and architecture as essential ingredients of IS strategies. These need to be complemented with considerations and

decisions on the in-house capabilities of the IT function and the vendor and provider network needed to provide a sustainable yet flexible infrastructure. Finally, IT risk and security is an important cross-sectional concern that needs to be included in an IS strategy. We expect that risk will be more and more addressed in an explicit security policy which then needs to be aligned with all other parts of IS strategy.

5 Epilogue

To conclude, we hold that the inadequate understanding of IS strategy has repercussions for a wide range of SISP research. Much more research needs to be done here. This research can build on groundwork done in the development of conceptual models of IS strategy as well as in the compilation of checklists. But this groundwork must be regarded as preliminary. On the one hand, existing literature on conceptual models is based only on conjecture and common sense. It is hardly founded on strategy theory and barely validated empirically. Even attempts at a sounder argumentative footing have not yet been tested empirically (e.g. Teubner and Mocker, 2009). On the other hand, existing empirical investigations into IS strategy contents do not provide a clear terminological base and have little common structure, which makes it difficult to draw comparisons between them.

In addition to, and as a result of, these shortcomings, we have found strong indications for a mismatch between the current state of research and strategy practice. As a response to this gap and based on the premises that the Information Systems discipline accepts the challenge of offering practical help to managers, we call for an adjustment of IT strategy research in order to better accommodate the concerns of practitioners. By this, we mean first of all that research should be fundamentally informed by strategy practice in order to ensure that it is well-grounded and relevant. Secondly, such an approach should feed intermediate results back into practice in order to make sure that results are valid and actionable from the outset.

These recommendations are not to say that researchers should direct their attention towards whatever practitioners demand. Rather, we are well aware of situational and political factors affecting IS strategy practice that researchers have to consider. Moreover, we found that even strategy experts in practice have difficulties explaining the rationales underlying their strategy agendas, which should make us even more cautious to accept their statements at face value (Teubner et al., 2012).

Nevertheless, exploratory and practice-oriented research, in our eyes, is the only route to an empirically sound, valid, and conceptually convincing understanding of IS strategy. We expect that such research will lead to refocusing the IS strategy debate from its traditional emphasis on application systems planning and competitive advantage to concerns that are related to building sustainable and flexible IT-based infrastructures which are critical to survival of organizations under the dynamically changing business conditions of the Information Age. Hence, future research must not be afraid of discarding antiquated ideas and concepts wherever they threaten to hamper progress.

6 References

- Aerts, A. T. M., Goossenaerts, J. B. M., Hammer, D. K., Wortmann, J. C. (2004). Architectures in context: on the evolution of business, application software, and ICT platform architectures. *Information & Management*, (41)6, 781-795.
- Aier S., Riege C., Winter R. (2008). Unternehmensarchitektur – Literaturüberblick und Stand der Praxis. *Wirtschaftsinformatik*, (50)4, 293-304.
- Aier, S., Krupjuweit, J. S., Winter, R. (2009). Enterprise Architecture Design as an Engineering Discipline. *AIS Transactions on Enterprise Systems*, (1)1, 36-43.
- Allen, D.K., Wilson, T.D. (1996). Information Strategies in UK Higher Education Institutions. *International Journal of Information Management*, (16)4, 239-251.
- Ansoff, H. I. (1994). Comment on Henry Mintzberg's Rethinking Strategic Planning. *Long Range Planning*, (27)3, 31-32.
- Auer, T., Reponen, T. (1995). Information Systems Strategy Formation Embedded into a Continuous Organizational Learning Process. *Information Resources Management Journal*, (10)2, 32-43.
- Baker, B. (1995) The role of feedback in assessing information systems planning effectiveness. *The Journal of Strategic Information Systems*, (4)1, 61-80.
- Bakos, J. Y., Treacy, M. E. (1986). Information Technology and Corporate Strategy: A Research Perspective. *MIS Quarterly*, (10)2, 107-119.
- Boddy, D., Boonstra, A., Kennedy, G. (2008). *Managing Information Systems: Strategy and Organization*. Harlow, England: Pearson Education.
- Booth, M., Philip, G. (2005). Information systems management: role of planning, alignment and leadership. *Behaviour & Information Technology*, (24)5, 391-404.
- Boynton, A. C., Zmud, R. (1987). Information Technology Planning in the 1990's: Directions for Practice and Research. *MIS Quarterly*, (11)1, 59-71.
- Brady, T., Cameron, R., Targett, D., Beaumont, C. (1992). Strategic IT issues: the views of some major IT investors. *The Journal of Strategic Information Systems*, (1)4, 183-189.
- Brown, I. T. J. (2004). Testing and Extending Theory in Strategic Information Systems Planning Through Literature Analysis. *Information Resources Management Journal*, (17)4, 20-48.
- Brown, I. T. J. (2010). Strategic Information Systems Planning: Comparing Espoused Beliefs with Practice. In Alexander, M., Turpin, M., van Deventer, J. (eds.): *Proceedings of the 18th European Conference on Information Systems*, Pretoria, South Africa.
- Carr, N. G. (2003). IT Doesn't Matter. *Harvard Business Review*, 81(5), 41-49.
- Cavaye, A. L. M., Cragg, B. (1993). Strategic information systems research: a review and research framework. *The Journal of Strategic Information Systems*, (2)2, 125-137.
- Chen, D., Mocker, M., Preston, D. S., Teubner, A. (2010). Information Systems Strategy: Reconceptualization, Measurement, and Implications. *MIS Quarterly*, (34)2, 233-259.

- Chi, L., Jones, K. G., Lederer, A. L., Pengtao, L., Newkirk, H. E., Sethi, V. (2005). Environmental assessment in strategic information systems planning. *International Journal of Information Management*, (25)3, 253-269.
- Clark, C., Clark, J., Gambill, S., Fielder, B. (2000). Strategic Information Systems Planning Paradoxes. *Information Strategy: The Executive's Journal*, (17)1, 27-31.
- Conrath, D. W., Ang, J. K., Mattay, S. (1992). Strategic planning for information systems: a survey of Canadian organizations. *Infor* (30)4, 364-378.
- Das, S. R., Zahra, S. A., Warkentin, M. E. (1991). Integrating the content and process of strategic MIS planning with competitive strategy. *Decision Sciences*, (22)5, 953-984.
- Doherty, N. F., Marples, C. G., Suhaimi, A. (1999). The relative success of alternative approaches to strategic information systems planning: an empirical analysis. *The Journal of Strategic Information Systems*, (8)3, 263-283.
- Doherty, N. F., Fulford, H. (2006). Aligning the information security policy with the strategic information systems plan. *Computers & Security*. (25)1, 55-63.
- Earl, M. J. (1989). *Management Strategies for Information Technology*. Essex, England: Prentice Hall.
- Earl, M.J. (1996). Integrating IS and the Organization. In Earl, M.J., (Ed.), *Information Management: the Organizational Dimension* (pp. 485-502). Oxford et al.: Oxford University Press.
- Earl, M. J. (2000). Every business is an information business. In Marchand, D. A., Davenport, T. H (Eds.), *Mastering Information Management* (pp. 16-20). London et al.: Financial Times Prentice Hall.
- Earl, M. J.: Integrating Business and IT Strategy: Reframing the Applications Development Portfolio. In Luftman, J. N. (Ed.), *Competing in the information Age: Align in the Sand* (p. 51-61). Oxford et al.: Oxford University Press.
- Feldman, M. S., Orlikowski, W. J. (2011). Theorizing Practice and Practicing Theory. *Organization Science* (22)1, 1240-1253.
- Finkelstein, C. (1992). *Information Engineering: Strategic Systems Development*. Sydney: Addison-Wesley.
- Flynn, D. J., Hepburn, P. A. (1994). Strategic planning for information systems – a case study of a UK metropolitan council. *European Journal of Information Systems* (3), 207–217.
- Frank, U., Klein, S., Krcmar, H., Teubner, A. (1998). Aktionsforschung in der Wirtschaftsinformatik: Einsatzpotentiale und Einsatzprobleme. In Schütte, R., Siedentopf, J., Zelewski, S. (Eds.), *Wirtschaftsinformatik und Wissenschaftstheorie. Grundpositionen und Theoriekerne. Arbeitsberichte des Instituts für Produktion und Industrielles Informationsmanagement No. 4*, Essen: Universität Essen.
- Galliers, R. D. (1991). Strategic information systems planning: myths, reality and guidelines for successful implementation. *European Journal of Information Systems*, (1)1, 55-64.
- Galliers, R. D. (2006). Strategizing for agility: confronting information systems inflexibility in dynamic environments. In De Souza, K (Eds.), *Agile Information Systems* (pp. 1-15). Oxford: Butterworth Heinemann

- Galliers, R. D. (2011). Further Developments in Information Systems Strategizing: Unpacking the Concept. In: *The Oxford Handbook of Management Information Systems: Critical Perspectives and New Directions*. Oxford et al.: Oxford University Press.
- Galliers, R. D., Merali, Y., Spearing, L. (1994). Coping with information technology? How British executives perceive the key information systems management issues in the mid 1990s. *Journal of Information Technology*, (9)3, 223-238.
- Galliers, R. D., Newell, S. (2003). Strategy as Data Plus Sense-Making. In Wilson, D. C., Cummings, S. (Eds.), *Images of Strategy* (p. 164-196). Oxford: Blackwell Publishing.
- Gottschalk, P. (1999a). Implementation predictors of strategic information systems plans. *Information and Management*, (36)2, 77-91.
- Gottschalk, P. (1999b). Implementation of Formal Plans: the Case of Information Technology Strategy. *Long Range Planning*, (32)3, 362-372.
- Gottschalk, P., Solli-Saether, H. (2005). Critical success factors from IT outsourcing theories: an empirical study. *Industrial Management and Data Systems*, (105)6, 685-702.
- Grover, V., Segars, A. H. (2005). An empirical evaluation of stages of strategic information systems planning: patterns of process design and effectiveness. *Information and Management*, (42)5, 761-779.
- Hackney, R., Burn, J., Dhillon, G. (2000). Challenging Assumptions for Strategic Information Systems Planning: Theoretical Perspectives. *Communications of the Association for Information Systems* 3, Article 9.
- Hay, G., Munoz, R. (1997). Establishing an IT Architecture Strategy. *Information Systems Management*, (14)3, 67-69.
- Hartono, E., Lederer, A. L., Sethi, V., Zhuang, Y. (2003). Key predictors of the implementation of strategic information systems plans. *The Database for Advances in Information Systems*, (34)3, 41-53.
- Hatten, M. L., Hatten, K. J. (1997). Information Systems Strategy: Long Overdue - and Still Not Here. *Long Range Planning*, (30)2, 254-266.
- Henderson, J. C., Sifonis, J. G. (1988). The Value of Strategic IS Planning: Understanding Consistency, Validity, and IS Markets. *MIS Quarterly*, (12)2, 187-200.
- Henderson, J.C., Venkatraman, N. (1989). Strategic Alignment: A framework for strategic information technology management. In MIT Sloan School of Management (Eds.), CISR WP 190, Cambridge, MA.
- Henderson, J.C., Venkatraman, N. (1993). Strategic Alignment: Leveraging information technology for transforming organizations. *IBM Systems Journal*, (32)1, 4-16.
- Hoey, A. (1998). Inside the RUC: Information Technology and Policing in Northern Ireland. *International Review of Law Computers*, (12)1, 15-26.
- ITGI – IT Governance Institute. (2008). *IT Governance Global Status Report 2008*. Rolling Meadows, USA: ISACA / IT Governance Institute.
- ITGI – IT Governance Institute (2011). *IT Status Report on the Governance of Enterprise IT (GEIT)*. Rolling Meadows, USA: ISACA / IT Governance Institute.

- Jarzabkowski, P.; Balogun, J.; Seidl, D. (2007): Strategizing: The Challenge of a practice perspective. *Human Relations* (69)5, 5-27.
- Johnson, G., Melin, L., Whittington, R. (2003): Guest Editor's Introduction. Micro Strategy and Strategizing: Towards an Activity-Based View. *Journal of Management Studies*, (40)1, 3-22.
- Kayworth, T. R., Chatterjee, D., Sambamurthy, V. (2001). Theoretical Justification for IT Infrastructure Investments. *Information Resources Management Journal*, (14)3, 5-14.
- King, W. R., Teo, T. S. H. (2000). Assessing the impact of proactive versus reactive modes of strategic information systems planning. *Omega*, (28)6, 667-680.
- Krüger, W., Pfeiffer, P. (1991). Eine konzeptionelle und empirische Analyse der Informationsstrategien und der Aufgaben des Informationsmanagements. *Zeitschrift für betriebswirtschaftliche Forschung*, (43)1, 21-45.
- Laurence, S., Margolis, E. (1999). Concepts and Cognitive Science. In Margolis, E. and Laurence, S. (Eds.), *Concepts and Cognitive Science: Core Readings* (p. 3-81). Cambridge, MA: The MIT Press.
- Lederer, A. L., Mendelow, A. L.: Information Systems Strategic Planning and the Challenge of Shifting Priorities. *Information and Management*, (24)6, 319-328.
- Lederer, A. L., Salmela, H. (1996). Toward a theory of strategic information systems planning. *The Journal of Strategic Information Systems*, (5)3, 237-253.
- Lehner, F. (1993). *Informatik-Strategien: Entwicklung, Einsatz und Erfahrungen*. München Wien: Hanser.
- Luftman, J., Ben-Zvi, T. (2011). Key Issues for IT Executives 2011: Cautious Optimism in Uncertain Economic Times. *MIS Quarterly Executive* (10)4, 203-212.
- Martin, J. (1989). *Information Engineering. Book 1: Introduction*. Englewood Cliffs, NJ: Prentice Hall.
- Mata, F. J., Fuerst, W. L., Barney, J. B. (1995). Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis. *MIS Quarterly*, (19)4, 487-505.
- McAfee, A., Brynjolfsson, E. (2008). Investing in the IT that Makes a Competitive Difference. *Harvard Business Review*, (86)7-8, 98-107.
- McFarlan, F. W., McKenney, J. L., Pyburn, P. (1983). The information archipelago - plotting a course. *Harvard Business Review*, (6)1, 145-156.
- McFarlan, F. W. (1984). Information technology changes the way you compete. *Harvard Business Review*. (62)3, 98-103.
- McGee, K., Plummer, D. C., Comport, J., Tully, J., Hafner, B., Mahoney, J., Fenn, J., Morello, D., McDonald, M. P., Prentice, S., & Kutnik, D. (2006). *The Gartner Scenario 2005: IT Leaders' Next Big Decisions*. Stanford, Connecticut: Gartner Inc.
- Melville, N. I., Kraemer, K., Gurbaxani, V. (2004). Review: Information Technology and Organizational Performance: An Integrative Model of IT Business Value. *MIS Quarterly*, (28)2, 283-322.
- Mintzberg, H. (1994). Rethinking Strategic Planning. *Long Range Planning*, (27)3, 12-30.

- Mocker, M. (2007). Defining the content of information strategy: linking theory and practice. (Doctoral dissertation). Available from Miami Database (http://miami.uni-muenster.de/servlets/DerivateServlet/Derivate-4151/diss_mockер.pdf), University of Muenster.
- Mocker, M., Teubner, A. (2006). Information Strategy - Research and Reality. Proceedings of the 14th European Conference on Information Systems, Gothenburg.
- Newkirk, H. E., Lederer, A. L. (2006). The effectiveness of strategic information systems planning under environmental uncertainty. *Information and Management*, (43)4, 481–501.
- Newkirk, H. E., Lederer, A. L., Srinivasan, C. (2003). Strategic information systems planning: too little or too much? *The Journal of Strategic Information Systems*, (12)3, 201-228.
- O'Connor, A. D. (1993). Successful strategic information systems planning. *Journal of Information Systems*, (3)2, 71-83.
- Parsons, G. L. (1983). Information Technology - A New Competitive Weapon. *Sloan Management Review*, (25)1, 3-14.
- Philip, G. (2007). IS Strategic Planning for Operational Efficiency. *Information Systems Management* (24)3, 247-264.
- Picot, A., Reichwald, R., Wigand, R. (2008). *Information, Organization and Management*. Berlin, Heidelberg: Springer.
- Porter, M. E., Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review*, (63)4, 149-160.
- Potter et al. (2011). IT Metrics: IT Spending and Staffing Report 2011 (G00210146). Stamford/Conn: Gartner Inc.
- Powell, T. C., Dent-Micaleff, A. (1997). Information technology as competitive advantage: The role of humans, business, and technology resources. *Strategic Management Journal*, (18)5, 375-405.
- Pyburn, P. J. (1983). Linking the MIS Plan with Corporate Strategy: An Exploratory Study. *MIS Quarterly*, (7)2, 1-14.
- Ross, J. W. (2004). Enterprise Architecture: Driving Business Benefits from IT. CISR Working Paper Nr. 359 and MIT Sloan Working Paper 4614-06. Cambridge, Mass: Center for Information Systems Research, Sloan School of Management.
- Sabherwal, R., King, W. (1995). An Empirical Taxonomy of the Decision- Making Processes Concerning Strategic Applications of Information Systems. *Journal of Management Information Systems*, (11)4, 177-214.
- Salmela, H., Lederer, A. L., Reponen, T. (2000). Information systems planning in a turbulent environment. *European Journal of Information Systems*, (9)1, 3-15.
- Salmela, H., Spil, T. A. M. (2002). Dynamic and emergent information systems strategy formulation and implementation. *International Journal of Information Management*, (22)6, 441-460.
- Segars, A. H., Grover, V. (1999). Profiles of Strategic Information Systems Planning. *Information Systems Research*, (10)3, 199-232.

- Senn, J. A. (1992). The Myths Of Strategic Systems: What Defines True Competitive Advantage?. *Information Systems Management*, (9)3, 7-12.
- Smits, M. T., van der Poel, K. G., and Ribbers, P. M. A. (1997). Assessment of Information Strategies in Insurance Companies in the Netherlands. *Journal of Strategic Information Systems* (6)2, 129-148.
- Szyperski, N. (1981). Geplante Antwort der Unternehmung auf den informations und kommunikationstechnischen Wandel. In E. Frese, P. Schmitz, N. Szyperski (Eds.) *Organization, Planung, Informationssysteme* (pp. 177-195). Stuttgart: Poeschel.
- Tai, L.A., Phelps, R. (2000). CEO and CIO perceptions of information systems strategy: evidence from Hong Kong. *European Journal of Information Systems*. (9)3, 163-172.
- Tamm, T., Seddon, P. B., Shanks, G., Reynolds, P. (2011). How Does Enterprise Architecture Add Value to Organisations? *Communications of AIS*, (2011)28, 141-168.
- Teece, D. J., Pisano, G., Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal* (18)7, 509-533.
- Teo, T. S. H., Ang, J. S. K. (2000). How useful are strategic plans for information systems?. *Behaviour and Information Technology*, (19)4, 275-282.
- Teubner, R. A. (2003). Information Engineering. *WISU – Das Wirtschaftsstudium*, (32)8, 1061-1070.
- Teubner, A. (2006). IT/Business Alignment. *WI-Schlagwort. Wirtschaftsinformatik*, (48)5, 368-371.
- Teubner, R. A. (2007). Strategic information systems planning: A case study from the financial services industry. *The Journal of Strategic Information Systems*, (16)1, 105-125.
- Teubner, R. A., Mocker, M. (2005). Strategic Information Planning – Insights from an Action Research Project in the Financial Services Industry. In Becker, J et al. (Eds.), *Working Paper No. 3, European Research Center for Information Systems (ERCIS)*. Münster, Germany: University of Münster.
- Teubner, R. A., Mocker, M. (2008). A Literature Overview on Strategic Information Systems Planning. In Becker, J et al. (Eds.), *Working Paper No. 6, European Research Center for Information Systems (ERCIS)*. Münster, Germany: University of Münster. Online available via Social Science Research Network (Paper No. 1959494).
- Teubner, R. A., Mocker, M. (2009). Towards a Comprehensive Model of Information Strategy. In Galliers, R., Leidner, D. E. (Eds.), *Strategic Information Management: Challenges and Strategies in Managing Information Systems*, London, 2009, 147-170.
- Teubner, R. A., Mocker, M., Pellengahr, A. (2009). Information Strategy: Confronting Research with Practice. In King, W. R. (Ed.). *Planning for Information Systems* (p. 387-412). Armonk, NY: M. E. Sharpe.

- Teubner, R. A., Pellengahr, A., Mocker, M. (2012). The IT Strategy Divide: Professional Practice and Academic Debate. In Becker, J et al. (Eds.), Working Paper No. 12, European Research Center for Information Systems. Münster, Germany: University of Münster. Online available via Social Science Research Network (Paper No. 2033156).
- Thome, R., Hufgard, A. (1996). Continuous Systems Engineering – Entdeckung der Standardsoftware als Organisator. Würzburg: Vogel Verlag.
- Tukey, J. W. (1980). We Need Both Exploratory and Confirmatory Research. *The American Statistician*, 34(1), 23-25.
- Ward, J., Griffiths, P. (1996). Strategic planning for information systems. Chichester: John Wiley.
- Ward, J., Peppard, J. (2005). Strategic planning for information systems. Chichester: John Wiley.
- Watson, R.T., Kelly, G.G., Galliers, R.D., Brancheau, J.C. (1997). Key Issues in Information Systems Management: An International Perspective. *Journal of Management Information Systems*, (13)4, 91-115.
- Weill, P., Broadbent, M. (1998). Leveraging the New Infrastructure. How Market Leaders Capitalize on Information Technology. Cambridge, MA: Harvard Business Press.
- Weill, P., Subramani, M., Broadbent, M. (2002). Building IT Infrastructure Strategic Agility. *Sloan Management Review*, (44)1, 57-65.
- Wexelblat, R.L. and Srinivasan, N. (1999). Planning for information technology in a federated organization. *Information and Management*, (35)5, 265-282.
- Whittington, R. (1996): Strategy as Practice. *Long Range Planning*, (29)5, 731-734.
- Whittington, R. (2006): Completing the Practice Turn in Strategy Research. *Organization Studies* (27)5, 613-634.
- Wilson, T. (1991). Overcoming the barriers to the implementation of information system strategies. *Journal of Information Technology*, (6)1, 39-44.
- Wiseman, C. (1985). Strategy and Computers: Information Systems as Competitive Weapons. Homewood, IL: Dow Jones-Irwin.
- Wöll, P. (2002). IT-Kosten und IT-Performance 2002. Betriebswirtschaftliche Studie der Schweizer Informatikabteilungen. Zürich: Ernst & Young AG.
- Zachman, J. A. (1987). A framework for information systems architecture. *IBM Systems Journal*, (26)3, 276-292.
- Zhu, K., Weyant, J. P. (2003). Strategic Decisions of New Technology Adoption under Asymmetric Information: A Game-Theoretic Model. *Decision Sciences* (34)4, 643-675.

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