

Association for Information Systems AIS Electronic Library (AISeL)

ECIS 2005 Proceedings

European Conference on Information Systems
(ECIS)

2005

Towards a Comprehensive Model of Information Strategy

Martin Mocker

European Research Center for Information Systems, martin.mocker@ercis.de

Alexander Teubner

European Research Center for Information Systems, alexander.teubner@ercis.de

Follow this and additional works at: <http://aisel.aisnet.org/ecis2005>

Recommended Citation

Mocker, Martin and Teubner, Alexander, "Towards a Comprehensive Model of Information Strategy" (2005). *ECIS 2005 Proceedings*. 62.

<http://aisel.aisnet.org/ecis2005/62>

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2005 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

TOWARDS A COMPREHENSIVE MODEL OF INFORMATION STRATEGY

Mocker, Martin, European Research Center for Information Systems, University of Münster,
Leonardo Campus 3, 48149 Münster, Germany, martin.mocker@ercis.de

Teubner, Alexander, European Research Center for Information Systems, University of
Münster, Leonardo Campus 3, 48149 Münster, Germany, alexander.teubner@ercis.de

Abstract

Strategic information planning is an important topic in practice as well as in research. Work so far has focused mainly on the planning process itself rather than on the actual information strategy as its output. The paper points out different approaches to substantiating the concept of information strategy with perhaps the most advanced approach being the system of plans approach. However, existing approaches are not satisfactory regarding their structure, completeness and rationales. We propose a more comprehensive model of information strategy that is argued to overcome the deficiencies of the existing approaches. Our model introduces the concepts of information infrastructure and information function. It helps to clarify ongoing discussions devoted to information strategy as a functional departmental strategy, to strategic alignment as well as to the role of the CIO and allows the integration of separate views on information strategy from different disciplines.

Keywords: Information Strategy, Strategic Information Planning (SIP), Strategic Information Systems Planning (SISP), Information Systems (IS) Strategy, Information Technology (IT) Strategy, Information Resource (IR) Strategy, Strategic Alignment.

1 MOTIVATION AND INTRODUCTION

Strategic information planning (SIP¹) is an important topic for information systems- (IS) and business managers. As such, SIP is among the highest-ranking issues on management agendas (Watson et al. 1997, Galliers 1993). There are several reasons for SIP's significance in practice: firstly, the application of information technology (IT) might result in strategic information systems that yield a competitive advantage. Kettinger et al. (1994, Appendix A) list 60 case examples of these strategic information systems. Porter and Millar (1985) provide a number of examples of how IT can change industry structure and may be used throughout the value chain to lower cost, enhance differentiation or spawn new businesses. Secondly, information and IT increasingly penetrate businesses' products and processes (Porter and Millar 1985), thus becoming not only an isolated, but a corporate wide, ubiquitous source for competitive advantage. Thirdly, ignoring SIP does not only result in lost strategic opportunities but might also lead to duplicated efforts, incompatible systems and wasted resources (Ward & Griffiths 1996, pp. xii, Lederer & Salmela 1996). Confirming this perception, management attention has also been identified as one crucial success factor for SIP (Earl 1993, Premkumar & King 1994, both cited from Gottschalk 1999, Byrd & Sambamurthy & Zmud 1995).

Its high importance in practice makes SIP an important topic for research, as well. Accordingly, a number of research efforts have already been devoted to this topic: for example, based on an analysis of 33 different English-speaking journals, Brown (2004) found that between 1991 and 2004 137 SIP-related articles were published.

However, most published SIP research focuses on the process of strategic planning whilst the result (the strategic information plan or information strategy) is often left out or at least left unsubstantiated. Brown (2004) identifies only a few articles covering the information plan in relation to the planning process (26% vs. 84%). Teo and Ang (2000) confirm that "most research seems to focus on the IS planning process itself [...] rather than on the output [...]".

This is a surprising fact since as long as a common concept of information strategy is lacking, i.e. there is no consensus on its domains (what are the objects of the strategy) and its content (which decisions have to be made regarding the domains), the discussion on the process (how to get to the content) necessarily remains vague. Thus, our claim is that an analysis of the process should be preceded by a substantiation of the output.

Consequently, this paper focuses on the output of SIP, i.e. information strategy. The objective of this paper is to improve the understanding of information strategy and to put forward a model of information strategy. To this end, we introduce the reader to the major approaches to substantiating the concept of information strategy in literature and point out their current shortcomings in chapter 2. Then, in chapter 3, we argue for a more comprehensive and better grounded model. Chapter 4 sets out how the proposed model contributes to prominent ongoing research discussions and how it advances them. Finally, we outline further research opportunities.

2 STATE OF THE ART OF INFORMATION STRATEGY: A CRITICAL REVIEW

Information strategy is a core responsibility of the top level IT executive, the so called Chief Information Officer (CIO). According to a study conducted by Stephens et al. (1995) 80% of surveyed CIOs are in charge of planning their company's information strategy. As argued above, the first thing

¹ Strategic information planning is often referred to as strategic information systems planning (SISP). We will lay out later why SIP is the more appropriate term.

a CIO needs to know when attempting to formulate an information strategy is what has to be decided on. This includes the question about the domains of an information strategy (what is it all about) and its content (which decisions have to be made regarding the domains). Unfortunately, scientific literature does not give a consistent answer to a CIO interested in getting to know what an information strategy is. This inconsistency is indicated by the usage of different terms for the output of SIP as demonstrated by the following examples: Lederer and Salmela (1996) use the terms "strategic information plan" and "IT strategy" – regretfully without explaining the differences between them. The latter term is used by Gottschalk (1999, 1999a) as well. Chan, Huff and Copeland (1998) use the terms "IS strategy" and "IS/IT strategy". Finally, Smits, van der Poel and Ribbers (2003) use the term "information strategy". We will lay out later, why we use the latter term as well in this paper.

Besides the usage of different terms, different approaches to substantiating the concept of information strategy can be identified in literature. We surveyed 35 articles that cover the output of SIP according to Brown's study (2004). Furthermore, major German (Teubner and Klein 2002) and English textbooks on information management were taken into account. Based on this work, we identified four types of approaches: 1. information strategy as a functional departmental strategy, 2. application portfolio as the core of information strategy, 3. information strategy as an enumerative list, 4. information strategy as a system of plans.

2.1 Information strategy as a functional departmental strategy

Some authors view information strategy as a departmental strategy. In this case, information strategy can be compared to strategies of other departments like the marketing or production department. Since these departments are traditionally in charge of business functions (e.g. marketing, production, sales, procurement) the information strategy is often said to be a functional strategy (see Lehner 1993, p.16; Smits & van der Poel & Ribbers 2003, p. 65; McLeod 1998, p. 40, 48; Boddy & Boonstra & Kennedy 2005, pp.90). Such a functional departmental strategy can be derived by breaking down the business strategy into the responsibilities of existing functional departments. This approach implies the existence of an organisational unit (i.e. an IT department) that provides an IT based infrastructure for information and communication. It also implies that the strategic decisions of the enterprise regarding IT and IS can be delegated to a department. Thus, information strategy as a functional departmental strategy is restricted to decision areas that affect the tasks of the respective department.

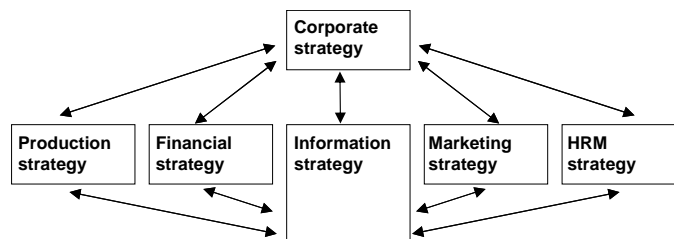


Figure 1. Alignment of information strategy with all other functional strategies according to Boddy & Boonstra & Kennedy (2005, p. 91).

One problem of viewing information strategy as a departmental strategy lies in the fact that unlike other functions, the use of information, information systems etc. permeate the whole enterprise in almost every process (Porter & Millar 1985). To address this issue, a number of authors propose to align the information strategy with all other departmental strategies (see figure 1). However, this alignment introduces a high level of complexity and still does not provide an overall perspective on information strategy.

2.2 Application portfolio as the core of information strategy

“It is conventional wisdom and practice” to see the core contents of information strategy as “an application development portfolio” (Earl 2003, p.59). Indeed, a huge number of articles suggest this approach (e.g. Lederer & Salmela 1996, Lederer & Sethi 1991, 1992, 1992a, 1996, Gottschalk 1999b, Salmela & Lederer & Reponen 2000; Ang & Shaw & Pavri 1995; Lehner 1993). The primary strategic decision to be taken is which information systems to develop in the future. Lederer and Sethi (1992a) explain that “this might embrace the selection of prosaic applications” and “might also entail the discovery of new applications with the potential to create an advantage over competitors”, i.e. strategic information systems. The authors do not provide good reasons for the application portfolio to be the primary contents of an information strategy. The question arises whether this is already exhaustive. For a planner it should be important to cover all required issues, since missing out on crucial issues might lead to unwanted side effects. E.g. the introduction of certain applications might have organisational implications like new skill requirements that would also need to be considered. Some authors advocating the application portfolio approach recognise this shortcoming and try to compensate it by adding other domains and decisions as components of an information strategy. Galliers (1991) for example states that “no longer should organisations be looking simply for a prioritised portfolio of information systems applications as the sole outcome of the process”. Admitting the lack of a better concept he nevertheless defines “IT strategy in a broad sense to incorporate the range of issues associated with strategy formation and implementation with respect to information systems” (Galliers 1993). He adds components such as “implementation change strategy” and “on-going assessment and review” without giving arguments for choosing just these components or for the list to be complete. The resulting proposal resembles the approach described in the next paragraph: enumerative lists.

2.3 Enumerative lists

Enumerative lists are sets of decisions that are typically identified either by literature review or surveys among planners (e.g., Conrath & Ang & Mattay 1992; Lederer & Salmela 1996; Das & Zahra & Warkentin 1991; Heinrich 2002, p. 106, 113; Flynn & Goleniewska 1993, Wexelblat & Srinivasan 1999). In some cases (e.g. Das & Zahra & Warkentin 1991) a structure is applied to this list so that list items get grouped into categories. Table 2 shows three examples.

Conrath, Ang and Mattay (1992)	Lederer and Salmela (1996)	Das, Zahra and Warkentin (1991)
Statement of objectives	Summary of organisation’s IT strategy	Distinctive competence emphasized in strategic MIS planning (cost of information, information differentiation for different applications, specialized information for specific market niches)
Hardware plan	Data and application plan (initial data entities, high-level specification of apps, requirements for data management, security and training, tools for system development and maintenance, cost, benefits, risks, and resource requirements resulting from the plan)	Dominant information processing technology
Projection of possible future MIS/EDP environment	Change management plan: actions that will facilitate adoption of IS plan	Level of computerization of the MIS function
Recommended implementation plan	HR plan: newly required IS skills, new roles/ responsibilities	Sources from which the firm obtains its IS technology
Systems development plan	Technical architecture of hardware, supporting databases and system	Contribution of MIS department to systems design and development
Financial Plan		Medium, by which MIS contributes
Personnel plan		Technical processes through which MIS are managed and controlled
Facilities plan		Organizational structure of the MIS
Projection of possible future user environment		
Organisation plan		
Education plan		
Projection of possible future industry environment		
Summary of strengths and weaknesses of staff		
Comparison of past IS performance		

vs. plan Alternate strategies	software Migration plan: overall approach, key projects, their order of implementation with cost, benefits, risks of each project Process description: annually updating the plan Appendix	unit Administrative policies used to motivate and manage employees in MIS department
----------------------------------	---	---

Table 2. Three examples of enumerative lists

As table 2 documents, the items to be included in an information strategy differ in number as well as in contents. The different levels of detail are striking, too: some proposals remain rather vague regarding what has to be planned: e.g. should a hardware plan describe the capacities needed or should it go down to the level of actual products? Some proposals even stay on a completely abstract level: Bajjalý (1998) for example lists IS mission, IS objectives, linkage between IS and organisational goals, IS action plans, assignment of tasks to specific people and mechanisms for management control. Other proposals contain items that can be classified as rather operational (i.e. non-strategic). Strategies should ensure that the strategic goals are reached in a specific way, but at the same time should leave enough room for manoeuvring for operational decision making (Steinmann & Schreyögg 2000, p.233, pp. 260). In contrast, for example Lederer and Sethi (1996, p. 37) propose that tools used for system development and maintenance, database specifications and a sequenced list of projects with cost, risk and benefit data should be specified in an information strategy. These decisions are typically made on a project management (i.e. implementation) level. Smits, van der Poel and Ribbers (2003, p.73 with reference to Theeuwes 1987) state that strategies “normally [...] do not include design and project plans”. This is because projects are already on a level of detail that does not allow the mentioned room for manoeuvring. Accordingly, a study conducted by Lederer and Sethi themselves (1996, p. 58) revealed that prescriptions related to database specification are not important to strategic information planners.

A further and fundamental problem of enumerative lists is that it is extremely difficult for a planner to assess whether the proposed lists are exhaustive. One reason for this is that the authors do not explain why the lists can be assumed to be comprehensive. Another reason is that no obvious structure is provided. To address this problem, e.g. Das, Zahra, Warkentin (1991, p. 957) synthesise their nine categories into "four major dimensions [...] by combining related categories to minimise intra-dimensional variance [...] and to maximise dissimilarity among dimensions". They come up with the categories “distinctive competence”, “information systems technology”, “systems design and development” and “MIS infrastructure”. This structure reduces the complexity of the list. Still, the structure remains artificial, since it is applied to a “range of issues” (Galliers 1993). Instead of presenting a model upfront and deriving the proposed items from this concept, the structure is applied to the collection of items ex-post. This leaves unclear what the actual domains are, that are being decided on (e.g. information technology, information systems, IS/IT organisation), how they are related and why they have to be covered by an information strategy.

2.4 Information strategy as a system of plans

In contrast to enumerative lists, systems of plans (e.g. Earl 1989; Tai & Phelps 2000; Henderson & Venkatraman 1992 after Chan & Huff & Copeland 1998; Peppard 1999; Ward & Griffiths 1996, pp. 30; McNurlin & Sprague 2006, pp. 134) present domains (potentially in the form of documents or parts of them) of information strategy and their relations in a structured form.

A very well received proposition (see Galliers 1991, p. 60; Krcmar 2003 pp. 33; Ragu-Nathan et al. 2001; Peppard 1999; Ward & Griffiths 1996, p. 30) was provided by Earl (1989) and has since undergone several extensions (Earl 1996; Earl 2000). He identifies three domains called “Information

systems (IS)", "Information technology (IT)" and Information management (IM)" by asking "what has to be done", "how does it have to be done" and "who should do it where" (see figure 3):

- IS strategy (see Earl 1989, pp. 67-94) can be seen as an extension of the application portfolio approach (see section 2.2). As such, it comprises an "application development portfolio [...], a 'shopping list' of applications and projects" (Earl 1989, p. 68). It is attributed as business led and demand oriented in that it is about "aligning IS development with business needs".
- IT strategy (see Earl 1989, pp. 95-116) is concerned with technology policies and addresses questions related to computer, communication, data and application architecture. Each of these architecture elements is described by a set of design parameters, schemas (models or blueprints), policies as well as goals and plans to achieve these goals. According to Earl, the structure of IT strategy is a matrix of elements (computing, communications, data and applications) and levels (parameters, schemas, policies and plans). IT strategy is regarded primarily as the supply side of the IS strategy. This becomes evident when Earl equates IT strategy with the "how" in contrast to the "what" of IS strategy. Furthermore, he explicitly attributes IT strategy to be supply oriented and technology focused and sees its main purpose as being "to ensure efficient (especially reliable) and effective delivery of the IS strategy" (Earl 1996, p. 495).
- IM strategy (see Earl 1989, pp. 117-128) "guides how the organization should run IS/IT activities" (Earl 1989, p. 117). It includes decisions on "the role and structure of IT activities in the organisation", "relationships between specialists and users and between the centre and divisions or business units", "management controls for IT", "management responsibilities", "performance measurement" and "management processes".(Earl 1989, pp. 65). Earl summarises IM strategy as being "concerned mainly with the relationship between the IS/IT function and the rest of the business" (Earl 1989, p. 118).

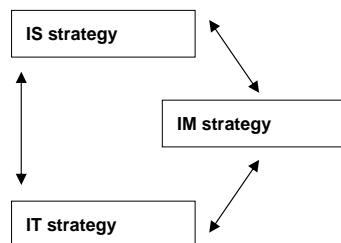


Figure 3. Domains of information strategy according to Earl (1989).

The system of plans approach extends enumerative lists with respect to structure and reasoning. Nevertheless, existing strategy models expose some shortcomings as well – Earl's model is used to demonstrate these shortcomings: Firstly, the reasoning used for his model is only based on common sense posing the three questions "what", "how" and "who". Accordingly, the relevance of the planning domains and the reasons for their distinction remain unproven. Another problem of this common sense based approach becomes evident when Earl himself identifies four tasks of information management as elements of IM strategy, namely planning, organisation, control and technology. He states that planning is covered by IS and IT strategy, technology is covered by IT strategy, leaving organisation and control questions to the IM strategy. Thus, the term IM strategy is misleading, since it only covers two of Earl's IM activities, making the distinction between IM, IS and IT strategy difficult. Grounding the distinction between information strategy domains on IS concepts or strategy theory rather than on the three questions would help to make a clearer distinction. Secondly, Earl (1996, p. 499) himself feels that his model is "not [...] either complete or fully validated". Thus it is not surprising that he later (Earl 2000) adds another domain labelled "information as a resource". Thirdly, the interrelationships among the domains (the relationship between IS and IT strategy is outlined in Earl 1988) and the relations between each domain and business strategy remain ambiguous. For example, when Earl (1989) mentions that IT can support business strategy and IT can create strategic options,

he does not distinguish between IT, IS or IM strategy. However, Earl perceives this as a problem himself and addresses it in a later publication (Earl 1996) where he proposes interrelationships between business strategy and the three information strategy domains. But even in this work he states that these proposals remain “conjectural” (Earl 1996, p. 491). Furthermore, the relations are described very roughly: Earl connects each domain with all other domains using four types of relationships for the twelve relations called “clarification”, “innovation”, “foundation” and “constitution”. Each of the four domains is associated with only one type of relationship. Thus the relationships serve more as an attribute of the domain rather than an action-oriented description of the relation that would be more helpful for planners in directing their planning logic. Furthermore, one can identify more relationships between the domains using the four types of relationship that have not been identified by Earl himself. For example, IT strategy – besides acting as a “foundation” for the other domains as proposed by Earl – can have the role of “innovation” as well.

3 TOWARDS A COMPREHENSIVE INFORMATION STRATEGY MODEL

We argue for two main domains of an information strategy, the information infrastructure (IIS) strategy and the information function (IF) strategy. The IIS strategy integrates and extends the core ideas behind IT and IS strategy as used by Earl (1989). It can be defined as addressing strategic decisions on the prerequisites needed to enable effective and efficient information and communication in a company’s business processes. The IF strategy extends Earl’s IM strategy and can be defined as addressing strategic decisions on the services required to build, maintain and enhance these prerequisites. Strategic IIS decisions are mostly investment decisions, while IF decisions focus on sourcing, governance and organisation. This difference requires the two domains to be handled differently in an information strategy, e.g. by applying a different planning logic.

IIS strategy and IF strategy are introduced in the following two sections. A third section explains the relationships between the domains in the overall model.

3.1 Information infrastructure strategy

As stated earlier, perhaps more common than the term “information strategy” are the terms “IT strategy” and “IS strategy”. What these three terms have in common is that they refer to some kind of infrastructure for information and communication within an enterprise – and often across its boundaries to other enterprises. However, the terms are biased towards the domain of the designated strategy: the term “IT strategy” which is widely accepted in practice highlights the role of information technology while the “IS strategy” often used in the academic context focuses on the application of IT to business problems and its organisational integration. For this reason, some authors (e.g. Galliers 1991, p. 60) view information systems as socio-technical systems including the organisational/human resources point of view. Nevertheless, both terms more or less imply a focus on technical components. Some authors criticise this view and explicitly advocate for putting the ‘I’ back into the discussion (Davenport 2000). They demand extending the perspective to the information itself as a resource and the mechanisms and prerequisites for collecting, storing, providing and using it. The corresponding strategy is called information resource (IR) strategy.

We see good reasons to integrate IT, IS and IR prerequisites for information supply into a coherent foundation that supports and enables information and communication activities within and across the boundaries of the enterprise. We call this domain the information infrastructure (IIS). It comprises

- An IT infrastructure consisting of hardware, communication networks and basic software such as operating systems and data base management systems. The IT infrastructure is not geared towards the solution of a certain business problem but acts as a basic platform on which to build solutions for specific business problems.

- The information systems as applications of IT solving a specific business problem.
- The cultural, organisational and qualification prerequisites for an effective provision and use of information resources. These prerequisites include e.g. policies for procuring external information and for organising information in catalogues as well as the qualification of employees to make effective use of information resources to solve a certain business problem (see Rockart 2004).

Such an infrastructure can be thought of as a three layer model as outlined in figure 4 (see Teubner 2003, pp. 44, who builds on Wollnik 1988). The basic logic of such a layer model is that lower layers provide services to higher layers while higher layers impose requirements on lower ones. According to this logic the IT layer in figure 4 delivers technical services which are applied to business problems on the IS layer. In turn the IS layer delivers information storage and supply services to the IR layer.

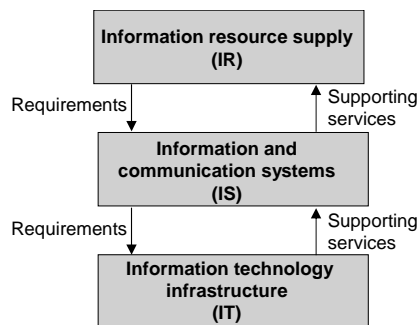


Figure 4. Three layer model of an information infrastructure

Each of these layers should be subject to distinct consideration in an information strategy – accordingly in an IR, IS and IT strategy – since each of them exhibits strategic relevance on its own. This is because the decisions planned on each level are different in nature, thus requiring the application of different decision logics and different competencies of the planner. This may imply that different people have to be involved in the strategic planning of each level. Many IT infrastructure investments are not business problem specific and thus should not only be seen as serving specific information systems. Weill and Broadbent (1998, p. 26) confirm this view by stating that IT infrastructure is “shared by multiple business areas and [...] used by several different applications. Thus, IT strategy decisions are concerned with building a “strategic IT platform [...] that not only responds to immediate needs but also provides escalating benefits over the long term” (Ross & Weill 2002, p. 86). For example, strategic IT infrastructure planning has to ensure compatibility among different IS and “cut through multivendor chaos and move toward vendor independence” (Weill & Broadbent 1998, p. 15) via a certain level of standardisation. Therefore, IT infrastructure investments address general goals such as “strategic agility and flexibility” (Weill & Broadbent 1998, p. 26; see also Weill & Subramani & Broadbent 2002) rather than specific business needs. The underlying strategic planning decisions have to address these goals. Parker, Benson and Trainor (1988, p. 57) recognize the specifics of IT infrastructure decisions in that they state that “traditional cost-benefit approaches don’t work well in areas of investment unrelated to specific development projects”. In contrast, each IS addresses a specific business problem or need. The corresponding IS strategy decisions are made on the basis of so called “business cases” that justify how well these specific business needs are fulfilled. When it comes to the IR layer, the strategic assessment of the economic value of information requires the application of yet another logic (see Rockart 2004; Lawrence 1999).

Here, our model is clearly different from Earl’s proposal, which regards IT strategy as the “how” for IS strategy. For us, IT strategy addresses the question “what prerequisites are needed in order to enable information and communication activities” just as IS and IR strategy. Since the layers of the IIS are all addressing the same “what” question and are connected via service and requirements relations, the

strategic decisions on each layer are interdependent as well. For example, the decision to invest into a new IS supporting the communication between employees might imply to invest into a groupware system and a new high-bandwidth network technology. While this network would be used for the IS, it is likely to have an impact on many other existing and planned IS as well and is thus not business problem specific. Because of these interrelations, the IIS has to be planned as an integrated whole in the context of an information strategy notwithstanding its distinct sub-strategies. Thus, IIS strategy is the central domain of the information strategy, comprising IR, IS and IT sub-strategies.

3.2 Information function strategy

Most of the contents of information strategies discussed in chapter 2 relate to parts of the IIS with a focus on IS and IT. This underlines the importance of the IIS and its parts as a central domain of an information strategy. But, the IIS strategy cannot be planned without taking into account the personnel resources and services necessary to run and maintain the IIS. Thus, we propose to capture the services required to run, maintain and (further) develop the IIS in the so-called information function (IF). Fulfilment of the IF requires personnel as well as technical facilities (e.g. CASE and administration tools). IF strategy is similar to Earl's IM strategy. Our concept though allows a clearer distinction between IIS and IF strategy than Earl's IM strategy is distinguished from IS and IT strategy: the IIS addresses the question "what prerequisites are needed in order to enable information and communication activities". Accordingly, strategic IIS decisions are mostly investment decisions. This is already reflected in the application portfolio approach (see section 2.2), which adopts the investment portfolio tool. In contrast, the IF addresses the questions "whose responsibility is it to deliver the services for these prerequisites and how are they delivered". Consequently, the decisions covered by an IF strategy are less investment focused but rather institutional decisions concerned with sourcing, governance (see Weill and Ross 2004) and organisation. For example, the IF services can be set up internally, within a central department called the IS/IT department or integrated into different business units, whilst in the case of outsourcing, parts of the IF are assigned to external partners. Again, the difference in the nature of strategic IIS vs. IF decisions requires the application of different planning logics and competencies.

3.3 Overall model of information strategy

Figure 5 sets out our model of an information strategy. The figure depicts the two main domains of an information strategy: the IIS strategy and the IF strategy. The IIS strategy comprises the IR, IS and IT strategy, corresponding to the three levels of the IIS model and their respective interrelations derived from the relations discussed in section 3.1.

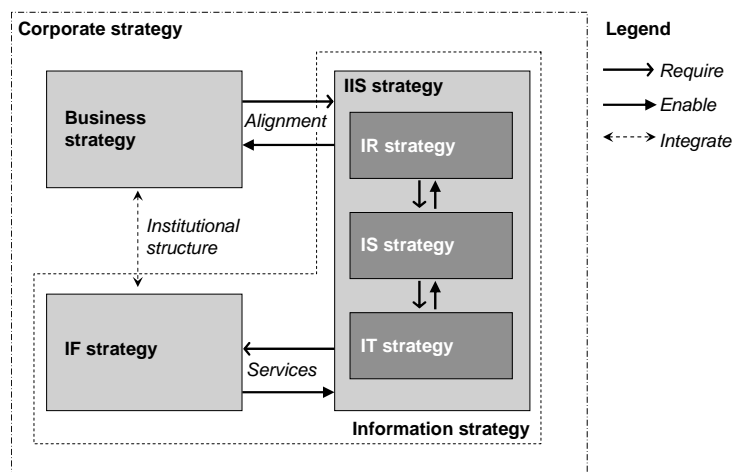


Figure 5. Extended information strategy model

Since the IIS imposes necessary services to run, maintain and (further) develop itself, any strategic decision regarding the IIS has implications on the IF strategy. This relationship is represented by the “Services” requirements arrow in figure 5. For example, a bank’s decision to invest into a new core banking IS is likely to trigger a strategic decision on who should build, run and maintain the IS. Here, one question is whether to build up the necessary qualifications internally or to outsource the services to an external provider. One should note that the IF (and thus the IF strategy) is only needed to act on the IIS. Thus, the IIS is the prime domain, the IF a derived domain of information strategy. Therefore, from a conceptual point of view, IIS strategy should determine IF strategy, not the other way around. However, future capabilities and services of the planned IF enable the development and operation of the IIS (indicated by the “Services” enablement arrow between IF and IIS strategy in figure 5).

In practice as well as in research, information strategy and business strategy are often recognised and handled as distinct items also on an organisational level. For example, Conrath, Ang and Mattay (1992) found that currently SIP is driven mostly by the IS department. Earl (1989) and others (e.g. Ross & Weill 2002) want to “encourage line management to take the lead” (Earl 1989, pp. 209). This organisational division of the domains is mainly for historic reasons: information technology was regarded as a complex matter that has to be covered by specialists (Hatten and Hatten 1997, p.254, speak of a “priesthood IS culture”). While this makes sense for operational activities (e.g. server monitoring), it becomes dangerous on a strategic level (Scholes 2001, p. 24 talks of a danger that “IT [...] starts to take on a purpose of its own – disconnected from the organisation’s strategies”).

Henderson and Venkatraman (1993) address this issue with their “strategic alignment model”, which has received much attention. On the one hand, information strategy enables new strategic business options (e.g. reaching new customer segments via the Internet); on the other hand, information strategy needs to support business strategy (e.g. focusing on customer relationship management might necessitate the introduction of a CRM system). Therefore, Henderson and Venkatraman (1993) advocate an alignment of business and information strategy (“Strategic Alignment”) as indicated by the “Alignment” arrows in figure 5. Similarly, strategic decisions concerning the IF cannot be made in isolation but have to be integrated into the context of the corporate-wide sourcing, governance and organisational structure resulting from business strategy (see Zarnekow & Brenner & Pilgram 2005, pp. 71). The dashed arrow “institutional structure” indicates that the relationship between IF strategy and business strategy is between the institutional structures that result from the respective strategies rather than between the strategies themselves.

We follow the distinction of information and business strategy, but only on a mental level. This is indicated by the fact that information strategy and business strategy are both embedded into an overall corporate strategy (figure 5). Some authors support this integrative view stating that information strategy should be part of a corporate strategy (Lederer and Sethi 1998, p. 23; McLeod 1998, p.40). By embedding information strategy into a corporate strategy our model implies that managers have to think about information strategy decisions each time they think about business strategy. Just as the IIS and the IF penetrate the whole business (Heinrich 2003, p. 8), information strategy thinking should penetrate all business strategy thinking. Thus, if every (business) manager incorporates strategic information planning into his business strategic thinking, a separate alignment becomes obsolete. This builds a basis for Earl’s and Feeny’s (1994) findings that “the most successful approach we have seen is where there are no IT strategies, only business strategies”.

4 CONTRIBUTION TO INFORMATION STRATEGY DISCUSSION

Our model follows the system of plans approach to information strategy which is capable of integrating the application portfolio approach within the IS strategy and the departmental approach as part of the IF strategy. Thus, it provides a taxonomy for literature on information strategy. In addition, it enhances the existing proposals of the system of plans approach with regard to completeness and reasoning. Having a more complete and grounded model of information strategy should have a

considerable impact on current discussions on the topic. Our model helps to advance the following discussions by providing a different or more complete view:

As stated in chapter 2.1, a number of authors argue that information strategy can be seen as a departmental strategy. Our model points out that a departmental information strategy cannot be more than just a part of an information strategy, i.e. the IF strategy. Additionally, this only holds true in the case of full insourcing and centralisation, i.e. when one department carries out the whole information function. In any case, the IIS part of information strategy must not be handled as an isolated departmental strategy, since the IIS permeates the entire corporation with all its functions (including the IF itself). In contrast to departmental strategies the IF strategy cannot be derived from business strategy directly, but only indirectly via the IIS strategy. Similarly, we demonstrate that information strategy is more than an application portfolio as only the IS strategy part of the IIS strategy domain is concerned with the application portfolio.

A second thread in the ongoing discussion is devoted to ownership of information strategy and the corresponding SIP process. We stated that nowadays, information strategy planning is mostly driven by the IS department (Conrath & Ang & Mattay 1992), but many authors (e.g., Earl 1989, Ross & Weill 2002) propose to give strategic IS decisions back to business managers. This artificial, organisational division of business and information strategy triggered the discussion about strategic alignment (Henderson & Venkatraman 1992). In the light of our model, business and information strategy have to be considered together in the context of one corporate strategy. In the ideal world, the corporate manager would make business and information strategy decisions together, thus directly mentally aligning the decisions. Consequently, there would not be two separate planning processes as implied by many authors who discuss activities of SIP processes without even mentioning the process of business strategy planning (e.g. Lederer & Sethi 1998). On the contrary, all steps of SIP would be performed as an integral part of the usual strategic business planning process (see Kovacevic & Maljuf 1993) by an “all-competent” corporate (business and information) manager.

Eventually, in the absence of those artificial boundaries, enterprises might as well do without a CIO. In this sense, Fazio Maruca (2000) provocatively asks “Are CIOs obsolete?”. Re-integrating business and information strategy on an organisational level – i.e. integrating what is mentally tied together anyway – might end up in every CxO becoming a CIO. Here, our model helps substantiating the discussion by outlining the areas of competence that have to be covered by every CxO.

Another discussion touches the integration of views of different scientific areas on information strategy. The focus in the past was very much on the technology and systems strategy (Galliers 1991). This is mostly true for information systems as a discipline. Authors with a different scientific background, especially in information sciences, focused – not surprisingly – on IR strategies (Trauth 1989, Butler 1997). Some IS researches, such as Davenport (2000) who claims for “Putting the I in IT”, have recognised the strategic importance of information itself. Our model helps to integrate the IS view with other disciplines’ views by incorporating IR strategy as one part of the IIS strategy.

5 FURTHER RESEARCH

The presented model can inform future research on information strategies and on the strategic information planning process, as well. The model helps to organise and integrate very different propositions on strategy contents found in literature. In face of the lack of consensus and the variety of approaches to substantiating the content of information strategy in scientific literature (see chapter 2), we are in line with Brown (2002, p. 27) who states that “it may be appropriate for more theory-generating research to be conducted, employing qualitative techniques”. Our model can help the qualitative researcher to structure and substantiate the strategic decision areas in practice. Furthermore, especially if the model receives empirical support, it may significantly contribute to a common and more generally accepted understanding of information strategy. Based on such a common understanding it would be possible and desirable to develop contingency models that could inform the

practitioner on the domains and contents that should be considered in an information strategy. On the other hand, a common understanding of information strategy is also a necessary precondition for research on the SIP process to be comparable. Such research can then extend contingency models on information strategy to the planning process and relate it to success (compare Raghunathan & Raghunathan 1994, Segars & Grover 1998, Fitzgerald 1993 as well as Lederer & Sethi 1996 for concepts of measuring SIP success).

References

- Ang, J., Shaw, N. and Pavri, F. (1995). Identifying Strategic Management Information Systems Planning Parameters Using Case Studies. *International Journal of Information Management*, 15 (6), 463-474.
- Bajjaly, S.T. (1998). Strategic Information Systems Planning in the Public Sector. *American Review of Public Administration*, 28 (1), 75-85.
- Boddy, D., Boonstra, A. and Kennedy, G. (2005). *Managing Information Systems: An Organisational Perspective*. 2nd Edition. Pearson, Harlow.
- 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.
- Butler, J.C. (1997). Another Node on the Internet. *Computers & Geosciences*, 23 (8), 915-916.
- Byrd, T.A., Sambamurthy, V. and Zmud, R.W. (1995). An Examination of IT Planning in a Large, Diversified Public Organization. *Decision Sciences*, 26 (1), 49-73.
- Chan, Y.E., Huff, S.L. and Copeland, D.G. (1998). Assessing realized information systems strategy. *Journal of Strategic Information Systems*, 6, 273-298.
- Conrath, D.W., Ang, J.K. and Mattay, S. (1992). Strategic planning for information systems: a survey of Canadian organizations. *INFOR*, 30 (4), 364-378.
- Das, S.R., Zahra, S.A. and Warkentin, M.E. (1991). Integrating the Content and Process of Strategic MIS Planning with Competitive Strategy. *Decision Sciences*, (22) 5, 953-984.
- Davenport, T.H. (2000). Putting the I in IT. In *Mastering information management* (Marchand, D.A., Davenport, T.H. and Dickson, T., Eds.), pp. 5-9. Prentice Hall, London.
- Earl, M.J. (1988). Formulation of Information Systems Strategies: Emerging Lessons and Frameworks. In *Information management: the strategic dimension* (Earl, M.J., Ed.), pp. 157-174. Oxford University Press, Oxford.
- Earl, M.J. (1989). *Management strategies for information technology*. Prentice Hall, London.
- Earl, M.J. (1993). Experiences in strategic information planning. *MIS Quarterly*, 17 (1), 1-24.
- Earl, M.J. (1996). Integrating IS and the Organization. In *Information Management: the Organizational Dimension* (Earl, M.J., Ed.), pp. 485-502. Oxford University Press, Oxford et al.
- Earl, M.J. (2000). Every business is an information business. In *Mastering information management* (Marchand, D.A., Davenport, T.H. and Dickson, T., Eds.), pp. 16-22. Prentice Hall, London.
- Earl, M.J. (2003). Integrating Business and IT Strategy. In *Competing in the Information Age: Align in the Sand*. 2nd Edition (Luftman, J.N., Ed.), pp. 51-61. Oxford University Press, Oxford et al.
- Earl, M.J. and Feeny, D.F. (1994). Is your CIO adding value?. *Sloan Management Review*, 35 (3), 11-20.
- Fazio Maruca, R. (2000). Are CIOs Obsolete?. *Harvard Business Review*, 78 (2), 55-63.
- Fitzgerald, E.P. (1993). Success measures for information systems strategic planning. *Journal of Strategic Information Systems*, 2 (4), 335-350.
- Flynn, D.J. and Goleniewska, E. (1993). A survey of the use of strategic information systems planning approaches in UK organizations. *Journal of Strategic Information Systems*, 2 (4), 292-319.
- 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. (1993). Research issues in information systems. *Journal of Information Technology*, 8, 92-98.

- Galliers, R.D. (2003). IT strategies: beyond competitive advantage. *Journal of Strategic Information Systems*, 2 (4), 283-291.
- Gottschalk, P. (1999). Implementation of Formal Plans: the Case of Information Technology Strategy. *Long Range Planning*, 32 (3), 362-372.
- Gottschalk, P. (1999a). Strategic information systems planning: the IT strategy implementation matrix. *European Journal of Information Systems*, 8 (2), 107-118.
- Gottschalk, P. (1999b). Implementation predictors of strategic information systems plans. *Information & Management*, 36, 77-91.
- Hatten, M.L. and Hatten, K.J. (1997). Information Systems Strategy: Long Overdue – and Still Not Here. *Long Range Planning*, 30 (2), 254-266.
- Heinrich, L.J. (2002). *Informationsmanagement: Planung, Überwachung und Steuerung der Informationsinfrastruktur*. 7th Edition. Oldenbourg, Munich and Vienna.
- Henderson, J.C. and Venkatraman, N. (1992). Strategic alignment: a model for organizational transformation through information technology. In *Transforming Organizations* (Kochan, T.A. and Useem, M., Eds.), pp. 97-117. Oxford University Press, Oxford
- Henderson, J.C. and Venkatraman, N. (1993). Strategic alignment: leveraging information technology for transforming organizations. *IBM Systems Journal*, 38 (2,3), 472-484.
- Kettinger, W.J., Grover, V., Guha, S. and Segars, A.H. (1994) Strategic Information Systems Revisited: A Study in Sustainability and Performance. *MIS Quarterly*, 18 (1), 31-58.
- Kovacevic, A. and Majluf, N. (1993). Six Stages of IT Strategic Management. *Sloan Management Review*, 34 (4), 77-87.
- Krcmar, H. (2003). *Informationsmanagement*. 3rd Edition. Springer, Berlin et al..
- Lawrence, D.B. (1999). *The Economic Value of Information*. Springer, Berlin, et al.
- Lederer, A.L. and Sethi, V. (1991). Critical Dimensions of Strategic Information Systems Planning. *Decision Sciences*, 22 (1), 104-109.
- Lederer, A.L. and Sethi, V. (1992). Meeting the Challenges of Information Systems Planning. *Long Range Planning*, 25 (2), 69-80.
- Lederer, A.L. and Sethi, V. (1992a). Root Causes of Strategic Information Systems Planning Implementation Problems. *Journal of Management Information Systems*, 9 (1), 25-45.
- Lederer, A.L. and Sethi, V. (1996). Key Prescriptions for Strategic Information Systems Planning. *Journal of Management Information Systems*, 13 (1), 35-62.
- Lederer, A.L. and Sethi, V. (1998). Seven guidelines for strategic information systems planning. *Information Strategy*, 15 (1), 23-28.
- Lederer, A.L. and Salmela, H. (1996). Toward a theory of strategic information systems planning. *Journal of Strategic Information Systems*, 5 (3), 237-253.
- Lehner, F. (1993). *Informatik-Strategien: Entwicklung, Einsatz und Erfahrungen*. Hanser, Munich.
- McLeod, R. Jr. (1998). *Management Information Systems: a study of computer-based information systems*. 7th Edition. Prentice Hall, Upper Saddle River.
- McNurbin, B.C. and Sprague, R.H. (2006). *Information systems management in practice*. 7th Edition. Pearson Prentice Hall, Upper Saddle River.
- Parker, M. M., Benson, R.J. and Trainor, H.E. (1988). *Information Economics: Linking Business Performance to Information Technology*. Prentice Hall, Englewood-Cliffs.
- Peppard, J. (1999). Information management in the global enterprise: an organising framework. *European Journal of Information Systems*, 8 (2), 77-94
- Porter, M.E. and Millar, V.E. (1985). How information gives you competitive advantage. *Harvard Business Review*, 63 (4), 149-160.
- Premkumar, G. and King, W.R. (1994). Organizational characteristics and information systems planning: an empirical study. *Information Systems Research*, 5 (2), 75-109.
- Raghunathan, B. and Raghunathan, T.S. (1994). Adaptation of a Planning System Success Model to Information Systems Planning. *Information Systems Research*, 5 (3), 326-339.
- Ragu-Nathan, B., Ragu-Nathan, T.S., Tu, Q. and Shi, Z. (2001). Information management (IM) strategy: the construct and its measurement. *Journal of Strategic Information Systems* 10, 265-289

- Rockart, J.F. (2004). Information: Let's get it right. CISR working paper no. 342 and Sloan working paper no. 4494-04. Massachusetts Institute of Technology, Cambridge.
- Ross, J.W. and Weill, P. (2002). Six IT decisions your IT people shouldn't make. *Harvard Business Review*, 80(11), 84-91.
- Salmela, H., Lederer, A.L. and Reponen, T. (2000). Information systems planning in a turbulent environment. *European Journal of Information Systems*, 9, 3-15.
- Scholes, K. (2001). Information, IT and Strategy. *The Journal of the Economics & Business Education Association*, 5 (2), 24-31.
- Segars, A.H. and Grover, V. (1998). Strategic Information Systems Planning Success: An Investigation of the Construct and its Measurement. *MIS Quarterly*, 22 (2), 139-163.
- Smits, M.T., van der Poel, K.G. and Ribbers, P.M.A. (2003). Assessment of information strategies in insurance companies. In *Strategic Information Management* (Galliers, R.D. and Leidner, D.E. Eds.), p.64-88, Butterworth-Heinemann, Oxford.
- Steinmann, H. and Schreyögg, G. (2000). *Management*. 5th Edition. Gabler, Wiesbaden.
- Stephens, C.S., Mitra, A., Ford, F.N. and Ledbetter, W.N. (1995). The CIO's Dilemma: Participating in Strategic Planning. *Information Strategy*, 11 (3), 13-17.
- Tai, L.A. and Phelps, R. (2000). CEO and CIO perceptions of information systems strategy: evidence from Hong Kong. *European Journal of Information Systems*, 9 (3), 163-172.
- Teo, T.S.H. and Ang, J.S.K. (2000). How useful are strategic plans for information systems?. *Behaviour & Information Technology*, 19 (4), 275-282.
- Teubner, R.A. and Klein, S. (2002). Vergleichende Buchbesprechung Informationsmanagement. *Wirtschaftsinformatik*, 44 (3), 285-294.
- Teubner, R.A. (2003). *Grundlegung Informationsmanagement*. Working paper no. 91, Department of information systems, University of Muenster.
- Theeuwes, J.A.M. (1987). *Informatieplanning*. Kluwer, Deventer.
- Trauth, E. (1989). The Evolution of Information Resource Management. *Information and Management*, 16 (5), 257-268.
- Ward, J. and Griffiths, P. (1996). *Strategic planning for information systems*. 2nd Edition, John Wiley & Sons, Chichester.
- Watson, R.T., Kelly, G.G., Galliers, R.D. and Brancheau, J.C. (1997). Key Issues in Information Systems Management: An International Perspective. *Journal of Management Information Systems*, 13 (4), 91-115.
- Weill, P. and Broadbent, M. (1998). *Leveraging the new infrastructure: how market leaders capitalize on information technology*. Harvard Business School Press, Boston.
- Weill, P. and Ross, J.W. (2004). *IT Governance*. Harvard Business School Press, Boston.
- Weill, P., Subramani, M. and Broadbent, M. (2002). Building IT Infrastructure for Strategic Agility. *MIT Sloan Management Review*, 44 (1), 57-65
- Wexelblat, R.L. and Srinivasan, N. (1999). Planning for information technology in a federated organization. *Information & Management*, 35, 265-282.
- Wollnik, M. (1988). Ein Referenzmodell des Informations-Managements. *Information Management*, 3 (3), 34-43.
- Zarnekow, R., Brenner W. and Pilgram, U. (2005). *Integriertes Informationsmanagement: Strategien und Lösungen für das Management von IT-Dienstleistungen*. Springer, Berlin et al.