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HOW TO ACT STRATEGICALLY IN A TURBULENT E-BUSINESS ENVIRONMENT - AN ECLECTIC APPROACH TO STRATEGIC INTER- ORGANISATIONAL SYSTEMS (IOS) MANAGEMENT

This paper presents an eclectic inter-organisational -oriented approach to so called strategic IOS management as an alternative to the more single organisation-oriented, linear approach of strategic information system planning (SISP). This approach is termed eclectic because it is based on a toolbox of mini-theories integrating existing strategic (IS) planning and management theories. The core component of this approach is an "IOS scenario and strategic option generator" based on forcing relationships between interactive IT capabilities and so-called business impact areas in an inside-out analysis on the intra-organisational company level, and an outside-in analysis on inter-organisational company network level. These impact areas embrace, on a company level, (i) the internal IT service chain structure (IT chain focus), (ii) the value chain structure (value chain focus), and (iii) the competitive industry structure (value system focus). On company network level they embrace, (iv) the intermediating support chain structure (support chain focus), (v) the inter-organisational supply chain structure (supply chain focus) and (vi) the customer community structure (demand chain focus).

Introduction

Background

In the mid-1990s, the emerging global data highways, provided by the Internet and the World Wide Web, created new inter-organisational system (IOS) opportunities for integrating cross-functional systems between companies,

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enabling new customised and intelligent worldwide services and products. A new era of electronic commerce, or electronic business had started. The interactive IT capabilities enabled these IOS innovations by expanding the range and reach (Keen, 1991) and range and richness (Evans and Wurstler, 1998) of information exchange between economic actors. Innovations in transaction patterns between companies and their customers and partners in order to sustain competitive advantage were emphasising and led to a shift towards a more dynamic, inter-organisational setting for IS planning in the era of electronic business.

Aim and structure of paper

In earlier research it has been argued that, especially in the inter-organisational, emergent context of E-business and IOS innovation, a more integrated, eclectic approach to strategic IOS management is needed (Finnegan et al., 1999; Hackbarth and Kettinger, 2000; Wassenaar and Gregor, 2001). Thus, a number of questions have motivated this paper. How should one undertake strategic information systems planning (SISP) in the field of more inter-organisational -oriented turbulent E-business? What can one learn from past SISP and strategic management research? How can we integrate existing strategic IS management knowledge, and make it more appropriate for the management of e-business or IOS innovations?

Our research objective is to develop an eclectic strategic IOS management approach, based on the existing strategic IS planning and strategic management knowledge. The paper proceeds as follows. Section 1 has introduced the subject, the aim and the structure of the paper. Section 2 presents the “eclectic and emergent management of inter-organisational systems” (EMIOS) framework. Section 3 describes the scenario and strategic option generator as a core component of strategic IOS management. This generator is a toolbox of mini-theories and is framing in a systematic way the existing knowledge in the field of SISP and strategic management. Section 4 presents conclusions and final remarks.

EMIOS: eclectic and emergent strategic management of IOS

From strategic IS planning (SISP) to strategic IOS management

SISP is defined as a process for identifying a portfolio of information systems that will assist an organization in executing its business plans and realising its business goals (Lederer and Sethi, 1988). This concept is based on

a distinction between the business domain and the IS domain and the alignment of a business strategy with an IS strategy (Parker and Benson, 1988; Henderson and Venkatraman, 1993). However, with the emergence of interactive IT capabilities such as the Internet and the WWW, business strategy planning and strategic IS planning are very strongly interrelated. Therefore they have to be integrated in what we can call strategic IOS management. In this respect, Aldrich (1999) argues that in the digital network economy the exchange of resources (transactions) between economic actors is becoming increasingly information intensive: the tangible container element (the physical product) in the exchange is enhanced by the intangible content elements (the accompanying information and knowledge). Thus, in many industries such as publishing and banking, the exchange of resources is becoming fully digitalised. The products and services can now be tailored to address the individual needs of each customer. As a consequence, the strategic management and SISP of interdependent organisations and their stakeholders, in the era of E-business, are interacting processes and may need further integration in, what is called, strategic IOS management. In an earlier review of the existing literature in both the field of SISP and strategic management was concluded, that strategic IOS management in the future has to change (Wassenaar and Gregor, 2001) in the following issues:

- planning scope: from a hierarchical, stable, single-organisation-oriented setting towards a more dynamic, inter-organisational setting.
- planning agenda: from a comprehensive focus on internal stable information systems to an issue-driven focus on dynamic IOS innovations.
- planning process: from a single organisational, top-down, linear orientation, driven by top management towards a more inter-organisational, middle up-and-down, iterative orientation, driven by interacting stakeholders from different organisations.
- planning constellation of involved stakeholders: from actors belonging to the same hierarchy to stakeholders belonging to different organisations with different mindsets, interests and objectives.

Beyond that, it was concluded that, in unpredictable, emergent environments with an intense competition, the concept of scenarios can help stakeholders in mapping out and sharing a wide range of possible futures by forcing them to think "outside the box" and especially outside the boundaries of their single organisational system (see also De Geus, 1988; Schoemaker, 1995).

The EMIOS framework

Starting from transaction economics (Williamson, 1981), strategic IOS management is defined as a process of contracting between involved stakeholders regarding IOS strategies and architectures, to achieve their common objectives and their actions to realise these strategies and architectures. This process can be described as a pattern of interrelated irreversible commitments over time by the involved stakeholders about what their common business is, what it should be, and how to change it. An IOS (innovation) strategy plan is defined as a common portfolio of IOS applications, data architectures, inter-organisational arrangements and the technical IT infrastructures of the involved stakeholders, to tie together their business transactions in a new and innovative way. An IOS strategy plan often assumes a business model or what we call a scenario, that is considered to be an overall vision and a basic architecture describing the core business of an interdependent company network, by specifying strategic themes such as the strategic positioning, the competitive strategy and value proposition, their common related value activities, their inter-organisational structure and basic technical IT infrastructure (Wassenaar, 2001). A cornerstone of this framework is "emergence", referring to a concept of organisations that does not assume underpinning stable structures (Truex et al., 1999). If emergence and turbulence, rather than stability, are taken as the dominant characteristics of the inter-organisational setting, then strategic IOS management can no longer be considered as a linear cycle of strategic analysis, choice, implementation, and evaluation, with a clear beginning and end. On the contrary, emergence calls for continuous, iterative, evolutionary strategic behaviour, often triggered by external events. The basic structure of the EMIOS framework is depicted in Figure 1. It encompasses a constellation of involved stakeholders, interacting in both reflection (planning and evaluating) and intervention (realisation) modes. In this framework, strategic IOS management is considered to be a continuous interaction between what we call a reflection mode and an intervention mode. It is exposed (formed) in the realisation system, and reasoned (formulated) in the planning and evaluation system. In the reflection mode of strategic IOS management, the stakeholders plan and evaluate their common IOS strategy plan through a modelling and a sense making/contracting process. In the intervention mode, the stakeholders realise their common IOS strategy plan through an, often incremental, implementation and institutionalisation process. This assumes a continuous, iterative, interaction between "reflecting about" and "intervening in" reality. In the reflection mode, the involved stakeholders are creating shared future worlds by continuous interactions and constant negotiations over facts, opinions and meanings. In this respect, scenarios can be helpful because their basic function is to identify future

trends and key uncertainties, and combine these into possible future worlds that are internally consistent and within the realm of possibility (Van der Heyden, 1996). The purpose of scenarios is not to cover all eventualities but to ensure that involved stakeholders are becoming aware of their shared future worlds and realities, and their underlying belief systems. They broaden the stakeholders often myopic and short-term mindsets, and make them aware of emergent future worlds and inherent common strategic options.

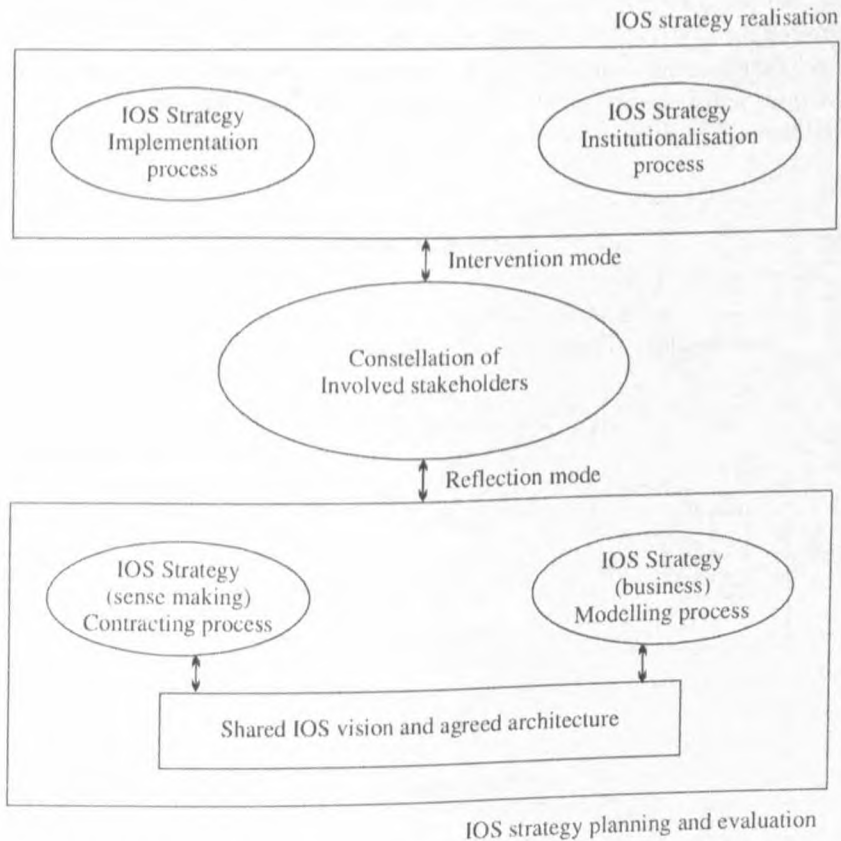


Figure 1 The basic structure of the EMIOS framework

Multi-view-based planning and evaluation

In a previous review of the literature it was found that strategic IOS management, and especially planning and evaluation of IOS strategies in the era of E-business, has to recognise the importance of the inter-organisational setting. Therefore we suggest a multilevel, or what we call a multi-view, analysis based on scenario consideration (Wassenaar and Gregor, 2001). First, we will consider the different positions, which the IOS innovations in an inter-organisational setting can be viewed. This inter-organisational setting embraces, based on Hoogeweegen (1997) and Klueber et al. (1999), an interrelated business network, a customer community network, and an institutional network (figure 2). The institutional network shapes the supply conditions (the business network) and the demand conditions (the customer community network) in an economy.

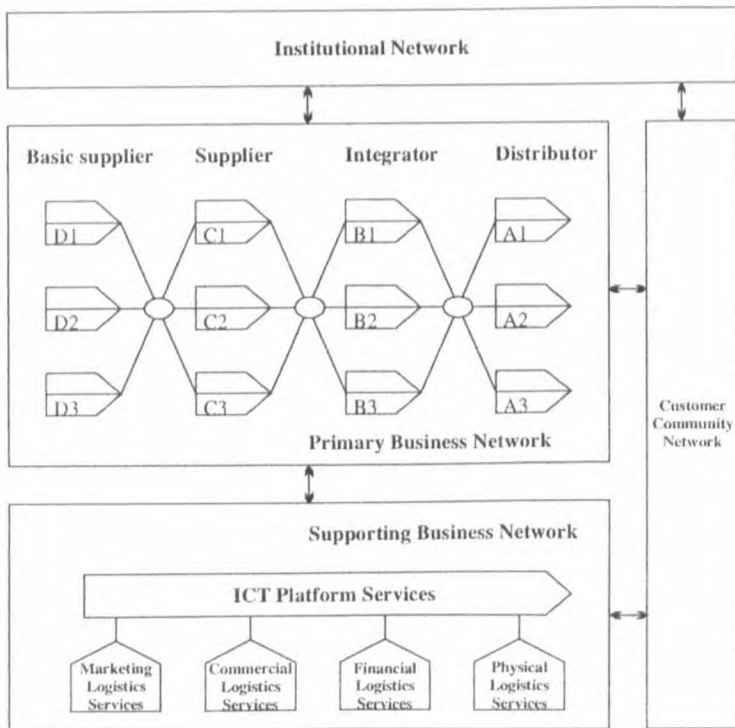


Figure 2 Inter-organisational setting for strategic IOS management

A business network is defined as a structure of interdependent relationships between activities of firms in their competitive and supportive environment that

influences their strategies. The resource exchange in one relationship is contingent upon exchange (or non-exchange) in the other relationship. We distinguish in business network a primary business network and a supporting business network. The core of the primary business network is a supply chain of goods and services (for example A1, B1, C1 and D1 in figure 2) flowing from upstream basic suppliers, through suppliers, integrators, and distributors, to downstream end consumers. Money flows in the opposite direction: from end-consumers to the supply chain members. To coordinate the flow of goods and services, information is exchanged between the supply chain members (both upstream and downstream). In this respect, an industry (for example D1, D2 and D3 in figure 2) can be defined as a group of firms that offer products, or a class of products that are close substitutes for each other (Kotler, 1988).

The resource (goods, services and money) exchange within a supply chain is facilitated by supporting business network activities. These, often cross-industrial support activities, connect buyers and sellers and create value by making trade (resource exchange) between firms in the primary business network more efficient. They deliver, in the transaction cycle, marketing and advertising logistic services (during the information and search phase), commercial logistic services (during the negotiation and contracting phase), financial logistic services and physical logistic services (during the settlement phase) (Schmid and Lindemann, 1998). These cross-industrial services, in the transaction cycle, delivered by sectors such as publishing and advertising, electronic markets, financial service and transport industries are facilitated by general ICT platform services offered by the telecom and internet-based industries. In their turn, firms can be characterised by an internal value chain, supported by an IT service chain (Porter and Millar, 1985; Rayport and Sviokla, 1998).

The customer community network is defined by Hagel III et al. (1997) as those drawn together by common interests and ending up as a group with a critical mass of purchasing power, to an extent due to the fact that customer communities allow members to exchange (easily by electronic media) information on such things as a product's price, its quality, and experience on how to use it. This phenomenon represents a fundamental shift in thinking, which can be characterised as a "replacement of the concept of the supply chain by the demand chain". The critical difference is that demand chain thinking starts with the customers, their community and values, and then works backwards. Jarvenpaa and Ives (1993) introduce, in this respect, the concept of thinking in reverse; Hagel III et al. (1999) present the principle of reversed marketing and customer driven networks, while Mowshowitz (1997) introduces the switching principle by stating that if a chain activity is managed by treating

need and need fulfilment (satisfiers) independently, it is possible to think systematically about switching between need and fulfillment. Aldrich (1999) discusses in this respect the role of a brand, working as a short hand to communicate a message about the attributes of a product, to the market at large. In his view, a brand offers value to a potential consumer in four ways: functional benefit, or the features of a product determining its use to consumers relative price benefit, or perceived value of the product to the consumer; the self expressive benefits, or the way in which product help consumers to express himself; and perhaps most importantly, the emotional satisfaction benefits that the consumer of the product will receive. The self- expressive benefits communicated by brands tend to be images that consumers wish to project outwardly, while emotional benefits are feelings savoured by the consumer inwardly.

The institutional network refers to those properties of the institutional system that facilitate and constrain the economic system. Based on North (1990), we define the institutional system as the rules of the game in a society, or more formally the constraints that shape human economic interaction and provide a structure for everyday life. These can be formal constraints (such as laws), or informal constraints (such as culture and customs). These rules, regarding the demand conditions, the technology factor (supply) conditions, the market competition conditions, and the general economic-institutional conditions are formulated and executed by governance agencies (Porter, 1990)

To conclude, in our model of the inter-organisational setting we have identified six impact areas of IT, which have to be considered in the reflection mode of strategic IOS management. These areas embrace, on the micro company level (i) the internal IT service chain structure (IT chain focus), (ii) the value chain structure (value chain focus), and (iii) the competitive industry structure (value system focus). On a meso company network level they embrace (iv) the intermediating support chain structure (support chain focus), (v) the inter-organisational supply chain structure (supply chain focus) and (vi) the customer community structure chain structure (demand chain focus).

The IOS scenario and strategic option generator

A toolbox of mini-theories for exploring the future

The core of the EMIOS framework is a generator which could be considered as a “time travelling machine”, that supports stakeholders in generating scenarios and options for the future by forcing relationships between

the interactive IT capabilities and the above mentioned six impact areas. This generator, depicted in Table 2, consists of six appraisal procedures, or "focusing devices", based on an integrated toolbox of "mini-theories" to support the involved stakeholders in exploring their future. This toolbox of mini-theories for exploring the future consists of (Table 1):

- three micro level appraisal procedures with an inside-out character, that force a relationship between the interactive IT capabilities and their impact on the IT service chain structure, the value chain structure, and the competitive industry structure; and
- three meso level appraisal procedures with an outside-in character, that force relationships between the interactive IT capabilities and their impact on the intermediating support chain structure, the inter-organisational supply chain structure, and the customer community structure.

Based on the mini-theories, presented in table 1, the emergent interactive IT capabilities in processing, storing and transporting data are "translated" by the involved stakeholders into strategic options for IOS applications in the distinguished impact areas. In particular, these interactive capabilities are enlarging the range and richness of information exchange between the value activities, owned by the involved stakeholders. They are enabling new patterns of intra-organisational and inter-organisational value activities.

Table 1 The IOS scenario and the strategic option generator

Inside-out			
Impact Area	IT Service Chain Structure	Value Chain Structure	Competitive Industry Structure
Appraisal Procedure			
Toolbox of mini-theories	Stage-based assimilation of technology (Nolan et al., 1994; Delen et al., 2000; Angehrn et al., 1997) Selective (out) sourcing (Lacity et al., 1996) Infrastructural IT service delivery platforms (Saaksjarvi, 1998)	Information processing capacity view (Galbraith, 1973) Value chain virtualisation/restructuring (Porter, 1980; Rayport & Sviokla, 1998; Venkatraman et al., 1998) Organisation learning, knowledge sharing (Boisot 1995)	Competitive positioning by influencing: competitive forces (Porter et al., 1985, 1996; Wiseman, 1985) Core competences knowledge management (Prahalad & Hamel, 1990; Zack, 1999)
Outside-in			
Impact Area	Intermediating support chain structure	Inter-organisational supply chain structure	Customer community structure
Appraisal Procedure			
Toolbox of mini-theories	Transaction governance (des-intermediation) (Malone et al., 1997; Benjamin et al., 1995); Reference model for electronic markets (Schmid & Lindemann, 1998)	Redesign of supply chain (Christiaanse et al., 1999; Kumar et al., 1996) Knowledge sharing in networks (trust) (Hakansson, 1987; Jarvenpaa et al., 1998)	Customer communities and their value (Hagel III et al., 1999; Aldrich, 1999) Dynamic networking (Hoogeweegen, 1997)

Inside-out appraisal procedure

The starting point of these appraisals is the internal situation of a firm and is based on forcing relationships between interactive IT capabilities and internal impact areas.

In the first appraisal the impact of increasing range and richness of IT on the IT service chain structure is explored. Based on mini-theories such as service management (Normann, 1984), the IS stage hypothesis of Nolan et al. (1994), the Balanced Score Card (BSC) concept (Van Grembergen et al., 2002) in combination of the capability maturity model (Delen et al., 2000) the IT service chain can be described in terms of a portfolio of application services and their user interactions (performance measured by customer satisfaction), a technology based delivery system structured after a development, exploitation, user support and maintenance process (performance measured by operational quality and excellence), human resources, their culture and competences (performance measured by human satisfaction and organisational learning), financial resources and their profitability (performance measured by stakeholders satisfaction) and IT governance (performance measured by transparency and management integrity). For example, the supply of new standardised telecommunication facilities (such as Internet and WWW) at lower cost of ownership are enabling new IT service chain structures by selective outsourcing of internal data processing and storing functions, user support, and maintenance of software towards external IT service providers (Lacity et al., 1996).

In the second appraisal the impact of increasing range and richness of IT on the value chain structure is explored. Based on mini-theories such as the information processing capacity view (Galbraith, 1973) and the concept of virtualising the value chain (Porter, 1980; Parker et al. 1988; Rayport & Sviokla, 1998) can be reduced the costly and quality affecting uncertainties in the value chain activities. Consequently, the supply of new standardised telecommunication facilities (such as Internet) at lower costs is enabling new value chain structures by substituting physical into virtual value activities (from place to virtual space). Other examples of virtualising are: lowering the cost of stock by the integration of information systems, regarding different isolated warehouse functions within the value chain (value linking), and by speed up the feedback regarding new product experiences from customer service to improving companies responsiveness on market needs (value accelerating).

In the third appraisal the impact of increasing range and richness of IT on the competitive industry structure is explored. Based on mini-theories such as resource based strategy theories (Porter et al., 1985; Porter, 1996; Prahalad & Hamel, 1990) the competitive position is influencing the competitive forces by strategic information systems, and influencing the core competences by knowledge management systems. Especially Internet can have a strong impact on the business transaction pattern and their underlying competitive forces in an industry. The classical examples are strategic information systems for locking in customers and for increasing the bargaining power against the suppliers. On the

other side, Internet can be a powerful weapon for companies to penetrate new markets.

Outside-in appraisal procedure

The starting point of these appraisals are the external situation of a firm and are based on forcing relationships between the emergent interactive IT capabilities and external impact areas.

In the fourth appraisal the impact of increasing range and richness of IT on the intermediating support chain structure is explored. Based on mini-theories such transaction governance theory (Malone et al., 1997) and the reference model of electronic markets (Schmid & Lindemann, 1998) transaction costs between companies and their business partners can be lowered by outsourcing their inter-organisational value activities (transaction governance) to specialised, often cross-industrial service providers such as advertisers, electronic intermediaries and banks. The level of outsourcing of these transaction governance activities depends on the transaction attributes such as their asset specificity, their frequency, and of the institutional system. Consequently, the supply of Internet facilities, increasing the range and richness of interactive IT capabilities, are enabling new intermediate support chain structures: for example by outsourcing financial logistic activities towards a management accounting service provider and by outsourcing commercial logistic activities towards an electronic market service provider. On the other side, the increasing, interactive IT capabilities of internet makes it possible for companies to insource inter-organisational activities from intermediaries (dis-intermediation). A special category of support service providers is the providers of IT platform services such as Internet providers and application service providers (ASPs). They are strongly involved in supporting the firms IT service chain activities (see the first appraisal)

In the fifth appraisal the impact of increasing range and richness of IT on the inter-organisational supply chain structure is explored. Based on the mini-theories such as supply chain redesign theory (Christiaanse et al., 1999) and network theory (Hakansson, 1987). The interaction (and the resulting cooperative advantages) of an inter-organisational supply chain activities depend on the following attributes (which are considered by Christiaanse et al. as design variables): dynamism in the social power constellation (stable versus dynamic constellation); the functional interdependence of the chain activities (sequential, pooled and reciprocal); transaction governance mechanisms (vertical integration, market, mutual adjustment) and coordinating information and knowledge transfer structures (centralised versus all to all connected interaction). The

increasing range and richness of interactive IT capabilities such as Internet and WWW are enabling new structures for a supply chain. For example, new coordination and knowledge transfer forms have their impact on the social power constellation by more switching opportunities, they are enabling more market oriented transaction governance mechanisms, and they facilitate new functional structures between supply chain activities.

In the sixth and last appraisal the impact of the increasing range and richness of IT on the customer community structure is explored. Based on the mini-theories such as customer community theory (Hagel III et al. 1999) and dynamic networking theory (Hoogenweegen, 1997). These customer community driven, dynamic networks are based on the principle of reverse marketing. There are formed temporary demand chain structures responding on the needs of one single, specific customer order. They are often organised by a temporary demand chain coordinator as an agent representing the customer community. The creation of the temporary demand chain structure is enabled by the increasing range and richness of interactive IT capabilities. These capabilities are facilitating more interaction within the customer community, resulting in more countervailing power of the customer against their suppliers than in the past.

How to organise the generation of scenarios and strategic options

In the first place, a central project team has to be established for the overall coordination of the efforts of the six study teams, one for each impact area. The central project team has to include a representative of general management, six middle managers as study team leaders, and one or two EMIOS experts. The central project team is coordinating the efforts of six study teams – one for each impact area. Each study team consists of three or four experts on the impact area and an EMIOS expert. The study teams have to start with a two-day strategic EMIOS management course. They are trained in the use of mini-theories, presented in the toolbox for generating EMIOS scenarios and strategic options. During this course the EMIOS framework and all the mini-theories are briefly introduced. Following this course, study teams are finally established for each impact area. In brainstorming sessions, each study team has to generate strategic options. The overall team, coordinating the efforts of the study teams, has to consolidate all the generated options into generic scenarios.

Conclusions and final remarks

Conclusions

The existing knowledge in the field of SISP and strategic management has been integrated in an eclectic approach of strategic IOS management. By framing the existing knowledge after six appraisal procedures, this approach aims to make the involved stakeholders in their reflection mode aware of possible future worlds and inherent strategic options. All the generated strategic options are basic ingredients for an IOS strategy plan and can be consolidated in alternative business models or what we call scenarios. These are considered to be an overall vision and a basic architecture describing the core business of an interdependent company network, by specifying strategic themes such as the strategic positioning, the competitive strategy and value proposition, all their common related value activities, their inter-organisational structure and their basic technical IT infrastructure. The developed eclectic approach of strategic IOS management has to be evaluated in practice, and especially on the appropriateness to think outside the box, to improve stakeholders capacity in understanding their situation and, recognition of interactive IT opportunities in different impact areas (such as strategic options and new business models), to improve the interaction between IOS strategy and corporate strategy and, finally to integrate different interests of involved stakeholders into a common plan for action.

Final remarks

The developed eclectic approach of strategic IOS management will be explored in practice based on defined criteria for appropriateness. Perhaps the presented mini-theories can be evaluated on their ability for analysing the existing situation, and for designing solutions for the future.

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