Achieving Increased Value for Customers Through Mutual Understanding Between Business and Information System Communities

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Business strategy and information systems (is) alignment is a long-standing issue in is management. Information technology it innovation, regulated by a deep understanding of value creation for customers, allows for profound changes in how companies operate and how economic exchanges are structured. To be able to achieve superior performance, companies must build business models that incorporate the competitive features found in their it. Realizing such innovation requires a common language between people from business and it departments. This article discusses essential elements of the continuous it innovation process, including generating ideas, developing concepts, and realizing concepts for it innovation. System projects jointly implemented by business departments and it departments proved to be more successful, because only this approach ensured full consideration of what is important from a company-wide perspective.

Key Words: business model, value creation, innovation, information technology, information systems
jel *Classification:* l15, q31

Introduction

The interaction between science and economy is an interdisciplinary topic that spans different disciplinary areas of science and engineering and management and economics – identified in the mid-1980s as management of technology (Betz 2003). In 1994, Cyret and Kumar (1994) asserted that organizations have to be able to adapt to technological innovation. Yet, despite the importance of technological innovation, it has not always been well understood or managed because the topic bridges two very different worlds: the technical and business worlds (Betz 2003). A vast cultural gap exists between these worlds – the world of matter and the world of money – while the material and financial worlds run on different laws: laws of nature or laws of economy (Betz 2003).[1] To promote

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and successfully implement progress in technology in business opportunities, technological innovation needs to be carefully managed (Betz 2003; Breen 2007; Sirkin, Hemerling, and Bhattacharya 2008), meaning that management must have knowledge of the kind of technological innovation, while firms must have a (technology) strategy for searching for innovation (Betz 2003, 333).

Similarly, alignment between business strategy and information systems (1s) is a long-standing key issue in 1s management (Brancheau and Janz 1996; Tidd, Bessant, and Pavitt 1997; Prahalad and Krishnan 2008) as such alignment improves business performance (Sabherwal and Chan 2001). The link between information technology (1T)/1s and business models is particularly strong, since 1T and 1s have been strong enablers for a variety of innovative business models (Tidd, Bessant and Pavitt 1997; Mumford and Licuanan 2004; Dodgson, Gann, and Salter 2005; Mumford, Hunter, and Bedell-Avers 2007). However, despite the general recognition of the importance of strategic alignment between strategy and 1s, research on achieving and sustaining such alignment is lacking (Hirschheim and Sabherwal 2001; Bhide 2008; Estrin 2008). Such research can be accomplished through constant 1T innovation that supports a firm's business model concept (Nagumo 2002; Morris, Schindehutte, and Jeffrey 2005; Shafer, Smith, and Linder 2005; Westerlund, Kajalo, Leminen, and Petteri 2007; Rappa 2009) – the content of the current paper.

Companies should strengthen their approaches to full utilization of information. 1T should in no way be regarded as merely a tool, as is generally the case in many companies today. 1T enables companies to increase quality, productivity, and speed of business processes. To acquire and maintain a competitive edge, companies should implement management that generates products and services creating value for customers, which can be realized through 1T- and 1s-based management. In other words, companies increase their employees' capabilities to use information for reforming business processes impacting the consumer value. The use of 1T and 1s also contributes to quick decision making based on accurately identified actual situations as well as to increased employee creativity by sharing knowledge and wisdom through close communication (Tidd, Bessant and Pavitt 1997; Mumford 2000; Hayes and Finnegan 2005; Mumford and Hunter 2005; Prahalad and Krishnan 2008).

Despite considerable expectations of 1T and 1s as the driving force behind innovation, empirical research (e. g., Stiroh 2001) has revealed

that companies are not satisfactorily regarding the achieved value (in Hill and Jones 2004). To generate IT innovation, discussions often focus on the roles of business departments and IT departments, debating which department should take the lead and what roles should be shared by both departments (Tidd, Bessant and Pavitt 1997; Dodgson, Gann and Salter 2005; Mumford and Hunter 2005). Therefore, this paper will discuss the use of the business model concept for IT innovation, addressing who is responsible for such innovation. It will also identify the essential elements necessary – namely, a chief information officer (CIO) and the IT department – for a company to establish systematic processes that continuously yield IT innovation. Finally, the paper will discuss emerging theoretical implications, suggesting several avenues for future research.

A Business Model Concept Usage in the IT Domain

By improving companies' capabilities to use information, IT and IS can be an effective means of continually strengthening existing businesses, especially as rapid advances in IT and IS have been accelerating the following trends:

- shifting products provided by companies to a digital format (i. e., achieving product functions through software use rather than mechanical components) (Močnik 2002a; Putra 2008);
- virtual product development (conducting product design and trial manufacturing on computers) (Bussler 1999; Fraunhofer-Gesellschaft 2008; Stackpole 2009);
- directly supplying products to consumers (suppliers deliver products directly to individual consumers) (Močnik 2002b; Howells 2006; Boyle, Humphreys, and McIvor 2008); and
- engaging in the self-service use of products and/or services (consumers select products and/or services via a network) (Dabholkar 1996; Ekinci and Riley 2003: Močnik 2004; Hwang and Kim 2007; Kang, Hong, and Lee 2009; Lin and Hsieh 2007).

Next-generation network infrastructures and high-speed wireless communications will enable future connections among various information terminals used by individual consumers and radio frequency identification tags attached to objects located everywhere (Dutta and Segev 1999; Shapiro and Varian 1999 in Amit and Zott 2001; Nagumo 2002; Nakamoto and Komeichi 2006; Tsuji 2006; Shiino 2009). As such, an

increasing number of companies will be quick to incorporate these advances and establish a new business format for relationships with new customers and transacting parties (Balakrishnan, Kumara, and Sundaresan 1999). These advances include not just process innovation, but also product innovation. Firms might develop core competencies, capabilities, and positional advantages that differ from those of competitors. For example, they might use these core competencies and capabilities to perform work activities in a unique way or might combine their work activities into business processes in a way that differentiates them from competitors (Hill and Jones 2004). They might even have a unique approach for securing the necessary capital to fund the creation of the core competencies, capabilities, and positional advantages (Shafer, Smith and Linder 2005). The ultimate goals of every company are to create and capture value for customers in order to remain viable over an extended period of time (Shafer, Smith and Linder 2005).

To achieve superior performance and profitability companies must build business models that incorporate the competitive features found in IT and IS. A business model is a conceptual tool containing a set of objects, concepts and their relationships with the objective of expressing the business logic of a specific firm (Timmers 1998; Amit and Zott 2001; Morris, Schindehutte and Jeffrey 2005; Shafer, Smith and Linder 2005; Westerlund et al. 2007). It is essential to consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this value is transferred, and what the financial consequences are (Osterwalder, Pigneur, and Tucci 2005, 3). The definition of a business model provided herein is sufficiently broad to embrace the different reflections on business models that have sprung up in different fields, such as e-business, information systems, computer science, strategy, or management (Pateli and Giaglis 2004). Thus, in the current discussion about IT and IS, a business model needs to be understood as a holistic concept that first embraces the conceptual link among strategy, business organization, and systems.[2] In addition, business model implementation incorporates a translation into concrete objects, such as business structures (e. g., departments, units, human resources), business processes (e. g., workflows, responsibilities), and infrastructures and systems (e. g., buildings, information and communication technology), that are subject to external pressure and thus constantly subject to change (Osterwalder, Pigneur, and Tucci 2005).

With the rapid spread of computers, the explosive growth of the Internet and corporate intranets (internal corporate computer networks based on Internet standards), and the spread of high-bandwidth fiber optics and digital wireless technology, is have had an evident positive impact on a firm's performance (Yodokawa and Okochi 2008). Companies are using web-based is to reduce the costs of coordination between the company and its customers and the company and its suppliers. By using web-based programs to automate customer and supplier interactions, the number of people required to manage these interfaces can be substantially reduced, thereby reducing costs and improving companies' competitive positions. Companies – and in some cases even competitors – jointly offer and commercialize value to their customers (Hill and Jones 2004). According to Porter (1985), value represents the amount buyers are willing to pay for what a firm provides them. Of course, a firm is profitable if the value it commands exceeds the costs involved in creating the product (Porter 1985, 38). As such, the aim of a company is to achieve as high a value as possible through differentiation at every step of the value chain or through activities resulting in products and services that lower buyers' costs or raise buyers' performance. Porter's drivers of product differentiation, and hence sources of value creation, are policy choices (which activities to perform and how), linkages (within the value chain or with suppliers and channels), timing (of activities), location, sharing of activities among business units, learning, integration, scale, and institutional factors (1985, 124–127). Regarding these drivers of value creation, IT and IS arguably create value by supporting differentiation strategies because the business design choices for managers increase substantially based on cheap and available IT (Porter and Millar 1985 in Amit and Zott 2001; Osterwalder, Pigneur, and Tucci 2005, 4).

In order to create value for customers through the use of IT, IT-based management is required, as discussed in the next section.

Who Is in Charge for IT-Based Innovation?

Schumpeter (1934) pioneered the theory of economic development and new value creation through the process of technological change and innovation. He viewed technological development as discontinuous change and disequilibrium resulting from innovation. Schumpeter further identified several sources of innovation, including the introduction of new goods or new production methods, the creation of new markets, the discovery of new supply sources, and the reorganization of industries

(Amit and Zott 2001). Hence, in Schumpeter's theory, innovation is the source of value creation.

As such, IT innovation also contributes to value creation for customers. As innovative companies exploit new opportunities for value creation, the evolution of the resulting IS must enable new exchange mechanisms and unique transaction methods while fostering new forms of collaboration among firms. IT and IS clearly open new sources of value creation through the exploitation of relational capabilities and new complementarities among a firm's resources and capabilities (e. g., between online and offline capabilities) (Amit and Zott 2001). IT innovation improves automation, connects a company to global markets, and supports a company in its method for supplying new products and implementing new production processes (Bussler 1999; Močnik 2002a; Howells 2006; Stackpole 2009).

Thus, IT innovation, as discussed herein, can never be achieved without the use of IT (as, for example, the emergence of a number of novel services on the Internet using IT). However, achieving a competitive position and sustainability of a strong conceptual foundation of the IT innovation, as well as close cooperation of the key people from various business departments and IS department, are required.

Innovation creates new value for customers, essentially falling under the domain of a business department. IT innovation is no exception, suggesting that a business department should take the lead. However, it is rarely possible for a business department alone to complete IT innovation. Indeed, the support of an IT and IS department is essential. When a variety of business departments are involved, the IT and IS department must play a leading role to ensure the process moves forward. Yet developing company-wide systematic processes to continuously bring about IT innovation is beyond the scope of individual business departments. Therefore, the CIO and IT and IS department (a group of IT and IS experts) are expected to assume a leadership role in dealing with this task because they are in a position in which they can take an extensive view of an entire company (Mumford and Licuanan 2004; Mumford and Hunter 2005; Mumford, Hunter and Bedell-Avers 2007; Schulze and Hoegl 2008). Table 1 outlines these relationships.

Essential Elements of the Continuous IT Innovation Process

To ensure continuity in IT innovation, it is necessary to develop systematic processes using three essential elements (Mumford 2000):

TABLE 1 Relationships between a business department and an IT/IS department

Tasks	Business department	IT/IS department
Individual IT/IS innovation projects	Takes the lead	Provides support (strong support is necessary)
Developing systematic processes that continuously bring about IT/IS innovation	Provides support	Takes the lead

Adapted from Yodokawa and Okochi 2008, 4.

1. Generating ideas for IT innovation
2. Developing concepts for IT innovation
3. Increasing the ability to realize concepts for IT innovation

GENERATING IDEAS FOR IT INNOVATION

The first issue of IT innovation is how to discover an idea that can increase customers' value of the product/service (Klein and Dologite 2000; Foo, Wong, and Ong 2005). It is particularly difficult to identify the ideas of employees who are not members of the management team (Vandermerwe 1987). In addition, a single person does not necessarily have a complete idea (Valacich, Jung, and Looney 2006; Rosa, Qualls, and Fuentes 2008). The concept of an idea may become apparent only after combining various ideas. Therefore, activities should systematically discover ideas that can lead to IT innovation (Howell and Boies 2004; Vidal 2006).

Discovering ideas can stem, for example, from establishing a dedicated team within the IT department (Yodokawa and Okochi 2008) to conducting activities on a regular basis (e. g., once a year). The team can collect and analyze ideas with common factors and areas of impact through informal discussions with the CIO and high-ranking managers of business operations departments, selecting the most promising ideas. A certain period should then be defined for forming a concept of IT innovation. Consequently, a project planned jointly with the relevant business department acquires company approval with which appropriate personnel and budget resources are secured. Finally, the project team is organized to realize the concept based on the advice of the innovation team members. System projects jointly implemented by business departments and the IT department have proved to be more successful (Schulze and Hoegl 2008) because full consideration is given to what is important from a company-wide perspective (from the customer view) and what

individual issues face each business operations department (McAdam and McClelland 2002).

The second possible approach to generating ideas involves improving frontline employees' abilities in the business and IT departments (Locock, Dopson, Chambers, and Gabbay 2001; Feder and Savastano 2006). Good ideas may emerge in two manners: employee gatherings and dissemination of information. In employee gatherings arranged by the IT department (workshops, study meetings, training courses for IT innovation), business operations and IT departments can discuss ideas for IT innovation once or twice a year (Yodokawa and Okochi 2008). In addition, the innovation team can disseminate IT innovation concepts successfully adopted throughout the company to enable other business and IT departments to use the accumulated thoughts, technologies, and ideas to generate ideas suitable for their respective departments (Yokokawa and Okochi 2008).

DEVELOPING THE BUSINESS MODEL CONCEPT FOR IT INNOVATION

The primary area of contribution of the business model research's could be the creation of concepts and tools that help managers to capture, understand, communicate, design, analyze, and change their firm's business logic (Osterwalder, Pigneur, and Tucci 2005). Although a company's business model is a simplified representation of its business concept, it is rarely described explicitly in a conceptual manner. Yet people are not always capable of clearly communicating their business model (Linder and Cantrell 2000 in Osterwalder, Pigneur, and Tucci 2005). Furthermore, because people use different mental models, they do not automatically understand the business model in the same way. Thus, a generic and shared concept for describing business models becomes necessary, meaning that a common language is needed between stakeholders in order to formulate business models in a way that everybody understands (Osterwalder, Pigneur, and Tucci 2005). This capability is particularly important for dialog among people from different backgrounds, such as managers, system architects, and engineers.

The business model concept helps to capture, understand, and visualize a company's business logic; being able to communicate and share this understanding with other stakeholders is simply a logical consequence. Formalizing business models and expressing them in a more tangible way help managers communicate and share their understanding of a busi-

ness among other stakeholders (Fensel 2001 in Osterwalder, Pigneur, and Tucci 2005).

Studying ideas and developing a concept that can lead to IT innovation involves three key elements: teamwork, value, and expression of the desired outcome. Teamwork refers to teamwork between people from both the business department and IT department. Business department members must not focus exclusively on the business aspect, just as IT department personnel should not focus only on the system aspect. Consequently, IT department members have to adapt to the business world, using the language understood by business department members and considering the development of the system from a customer's perspective.

The second important element in developing a concept is to discuss the new value without focusing on how (by which means or functions) the new value could be achieved. A visual system can be used to substantially increase the degree to which complexity can be handled successfully (Rode 2000 in Osterwalder, Pigneur, and Tucci 2005) as it helps project members understand what the new business/system will be like (Gordijn and Akkermans 2003 in Osterwalder, Pigneur, and Tucci 2005). As business models are increasingly complex – particularly those with strong ICT and e-business components – the relationship between the different elements of a business model and the decisive success factors are easily observable and understood when viewed graphically (Morecroft 1994 in Osterwalder, Pigneur, and Tucci 2005; Ushold and King 1995 in Osterwalder, Pigneur, and Tucci 2005). By viewing the prototype, project members can discuss what will satisfy customers' needs and what a new business/system should be to meet such needs. Thus, when a company decides to adopt a new business model or change an existing one, capturing and visualizing the model will enhance planning, change, and implementation. It is much easier to go from one point to another when individuals precisely understand, say, and show which elements will change (Dodgson, Gann and Salter 2005; Mumford and Hunter 2005; Mumford, Hunter and Bedell-Avers 2007). In this regard, Linder and Cantrell (2000) speak of so-called change models – the core logic for how a firm changes over time to remain profitable in a dynamic environment.

The third element in developing a concept for IT innovation refers to the expression of the desired outcome (Prahalad and Krishnan 2008; Rosa, Qualls and Fuentes 2008). The business department maintains close contact with customers; thus, these employees should have ideas

about what a new business/system should be like. However, they might encounter difficulties in skillfully imagining and expressing the desired outcome. IT department employees can – at this point – provide the necessary support, eliciting ideas about what a new business/system should be like. The IT department must also be able to show cases of IT innovation achieved by others, helping project members actually see the ultimate outcome (Stähler 2002).

INCREASING THE ABILITY TO REALIZE CONCEPTS FOR IT INNOVATION

Realizing a concept that can bring about IT innovation entails many difficulties that may be resolved by the organization's capabilities to implement projects (e. g., project management capability, the capability of promoting organizational reforms) (Mumford, Hunter, and Bedell-Avers 2007). The methodology for generating IT innovation can be divided into three steps: the accumulation of achievements, establishment of methodology, and dissemination of innovation between departments (Mumford and Hunter 2005).

Engaging IT department employees in innovation activities requires separating daily routines from innovation operations by establishing a dedicated team for innovation and providing an environment in which these individuals can concentrate on innovation activities (Mumford 2000). The first step should involve the team accumulating the achievements of IT innovation. Because IT innovation relates directly to the creation of customer value, IT innovation activities are nothing less than business activities from which results are expected. Thus, to persuade business departments to strive for the realization of IT innovation, it is essential to build up the achievements rather than simply build mechanisms without showing any results (Yodokawa and Okochi 2008). Therefore, the joint work of the IT and business departments is necessary to identify a specific concept, engage in repeated trial and error, and realize the concept. The dedicated team must build up the results by experiencing the pains involved in realization.

The second step (securing the successful realization of the concept) involves establishing the appropriate methodology for IT innovation. The team's goal is to generate IT innovation (i. e., the accumulation of achievements and establishment of methodology) (Mumford 2000; Dodgson, Gann and Salter 2005; Mumford and Hunter 2005). The third step–disseminating the generation of innovation among departments–

aims to increase the number of employees who can promote IT innovation (Mumford and Licuanan 2004; Kramer et al. 2009). As such, not only do IT and IS people conduct innovation by distributing manuals and materials that explain the methodology, but other members from business departments who have relevant knowledge also join the discussion with the innovation team members in the particular business department.

The first step requires approximately five years to complete, while the second step requires two to three years, and step three requires another two to three years – or more (ongoing) – to generally disseminate the methodology throughout the company. Accordingly, companies spend about ten years total going through all three steps. Therefore, the CIO's and other management executives' strong commitment to these activities is indispensable.

Conclusion

Superior innovation – an essential element in a company's growth – is one of the four functional strategies (together with superior efficiency, quality, and customer responsiveness) comprising the roots of a company's competitive advantage (Hill and Jones 2004). In realizing innovation, IT and IS often play important roles, referred to herein as IT innovation. To acquire and maintain a competitive edge, companies must implement management that generates products and services creating value for customers, which can be realized through IT-based management – namely, companies increase employees' capabilities to use information to reform business processes that impact consumer value. To achieve superior performance and profitability, companies must build business models that incorporate competitive features found in IT and IS. As the scope of IT applications expands, greater expectations are emerging within companies' IT innovation. However, thus far, few companies have reached a satisfactory level of innovation in this field.

To bridge the gaps between expectations and reality, companies should ensure continuity in IT innovation by establishing systematic IT innovation processes. The first step is to form a dedicated team concentrating on generating IT innovation ideas, developing the business model concept for IT innovation, and increasing the ability to realize concepts for IT innovation. Long-term firm commitment on the part of the CIO and other management executives is indispensable for achieving these activities, since accumulating IT innovation achievements, successfully estab-

lishing appropriate methodology for IT innovation, and disseminating innovation requires approximately ten years.

IT innovation value creation potential explains why companies and industries vary in their success and why new ways of creating value stem from new forms of connecting buyers and sellers in existing markets as well as innovative market mechanisms and economic exchanges. However, in order to achieve superiority, IT innovation must be regulated by a deep understanding of value creation through profound changes in how companies operate and economic exchanges are structured. Therefore, companies must build business models that incorporate competitive features found in IT and IS.

Generating IT innovation requires a strong conceptual foundation as well as a clear understanding of which department should take the lead. Business department members play a vital role in IT innovation, although a business department can rarely complete IT innovation alone; thus, IT department support is essential. When various business departments are involved, nothing can move forward without the strong support of an IT department; as such, the IT department must sometimes play a leading role. Yet developing company-wide systematic processes to continuously bring about IT innovation, based on the business model concept, requires that the CIO and IT department (i.e., a group of IT and IS experts) take the lead because only they are in a position to comprehend the entire company. In this case, business departments provide support to the IT department.

The aim of the paper is twofold. First, to contribute to the research that brings the common knowledge of the 'what' and 'how' to benefit business people and IT and IS practitioners in their effort to ensure successful IT and IS implementation as the driving force behind innovation. Second, to expose the necessary consistency of the business model and the IT and IS, that is the key long-term issue of successful business. We place special emphasis on the meaning of the business model concept that should be understood as a view of the firm's logic for creating and commercializing value. The important part of this value creation process is also the efficient implementation of IT innovation. We stress the need that the term business models should not be confused with the different meaning of business process models that represent various things, such as parts of a business model (e. g. auction model), types of business models (e. g. direct-to-customer model), concrete real world instances of business models (e. g. the Dell model) or concepts (elements and rela-

tionships of a model). In contrast to the business models, they can only partially contribute to the company's overall performance.

Notes

1 For an in-depth discussion about the role of science, technology, engineers, technologists, economists, and technological progress for the economy, see Betz (2003).

2 Because the business model concept is relatively young, its place and role in the firm remain subject to debate. Some people use the terms 'strategy' and 'business model' interchangeably (Magretta 2002 in Osterwalder, Pigneur and Tucci 2005), believing that referring to everything gives them a competitive advantage (Stähler 2002). Yet, the view that business models and strategy are linked but distinct is more common (Mansfield and Fourie 2004 in Osterwalder, Pigneur and Tucci 2005). A practical distinction describes a business model as a system that shows how the pieces of a business fit together, while strategy also includes competition and implementation (Magretta 2002 in Osterwalder, Pigneur and Tucci 2005). In contrast, others understand the business model as an abstraction of a firm's strategy that may potentially apply to many firms (Seddon and Lewis 2004 in Osterwalder, Pigneur and Tucci 2005). Business model literature seems to fit the former definition better, as most of the literature focuses on describing the elements and relationships that outline how a company creates and markets value.

References

Amit, R., and C. Zott. 2001. Value creation in e-business. *Strategic Management Journal* 22 (6–7): 493–520.

Balakrishnan, A., S. R. T. Kumara, and S. Sundaresan. 1999. Manufacturing in the digital age: Exploiting information technologies for product realization. *Information Systems Frontier* 1 (1): 25–50.

Betz, F. 2003. *Managing technological innovation: Competitive advantage from change.* 2nd ed. New York: Wiley-Interscience.

Bhide, A. 2008. *The venturesome economy: How innovation sustains prosperity in a more connected world.* Princeton, NJ: Princeton University Press.

Boyle, E., P. Humphreys, and R. McIvor. 2008. Reducing supply chain environmental uncertainty through e-intermediation: An organization theory perspective. *International Journal of Production Economics* 114 (1): 347–62.

Brancheau, J. C., and B. Janz. 1996. Key issues in information systems management: 1994–95 SIM Delphi results. MIS *Quarterly* 20 (2): 225–42.

Breen, B. 2007. *The future of management.* Boston, MA: Harvard Business School Press.

Bussler, M. L. 1999. Virtual product development tools will shorten time to market. Http://www.algor.com/news_pub/tech_reports/1999/virtual _development/virtual_development.asp.

Cyret, R. M., and P. Kumar. 1994. Technology management and the future. IEEE *Transactions on Engineering Management* 41 (4): 333–34.

Dabholkar, P. A. 1996. Consumer evaluations of new technology-based self-service options: An investigation of alternative models of service quality. *International Journal of Research in Marketing* 13 (1): 29–51.

Dodgson, M., D. M. Gann, and A. Salter. 2005. *The management of technological innovation: Strategy and practice.* 2nd ed. Oxford: Oxford University Press.

Dutta, S., and A. Segev. 1999. Business transformation on the Internet. *European Management Journal* 17 (5): 466–76.

Ekinci,Y., and M. Riley. 2003. An investigation of self-concept: Actual and ideal self-congruence compared in the context of service evaluation. *Journal of Retailing and Consumer Services* 10 (4): 201–14.

Estrin, J. 2008. *Losing the innovation gap: Reigniting the spark of creativity in a global economy.* New York: McGraw-Hill.

Feder, G., and S. Savastano. 2006. The role of opinion leaders in the diffusion of new knowledge: The case of integrated pest management. *World Development* 34 (7): 1287–300.

Fensel, D. 2001. *Ontologies: Silver bullet for knowledge management and electronic commerce.* Heidelberg: Springer.

Foo, M. D., P. K. Wong, and A. Ong. 2005. Do others think you have a viable business idea? Team diversity and judges' evaluation of ideas in a business plan competition. *Journal of Business Venturing* 20 (3): 385–402.

Fraunhofer-Gesellschaft. 2008. Experiencing virtual products prior to product development. *Science Daily,* April 21. Http://www.sciencedaily .com/releases/2008/04/080416111607.htm.

Gordijn, J., and M. Akkermans. 2003. Does e-business modelling really help? Paper presented at the 36th Hawaii International Conference on System Sciences, Big Island, Hawaii.

Hayes, J., and P. Finnegan. 2005. Assessing the potential of e-business models: Towards a framework for assisting decision-makers. *European Journal of Operational Research* 160 (2): 365–79.

Hill, C. W. L., and G. R. Jones. 2004. *Strategic management: An integrated approach.* 6th ed. Boston and New York: Houghton Mifflin Company.

Hirschheim, R., and R. Sabherwal. 2001. Detours in the path toward strategic information systems alignment. *California Management Reviews* 44 (1): 87–108.

Howell, J. M., and K. Boies. 2004. Champions of technological innovation: The influence of contextual knowledge, role orientation, idea generation, and idea promotion on champion emergence. *The Leadership Quarterly* 15 (1): 23–43.

Howells, J. 2006. Intermediation and the role of intermediaries in innovation. *Research Policy* 35 (5): 715–28.

Hwang, Y., and D. J. Kim. 2007. Customer self-service systems: The effects of perceived Web quality with service contents on enjoyment, anxiety, and e-trust. *Decision Support Systems* 43 (3): 746–60.

Kang, Y. S., S. Hong, and H. Lee. 2009. Exploring continued online service usage behavior: The roles of self-image congruity and regret. *Computers in Human Behavior* 25 (1): 111–22.

Klein, E. E., and D. G. Dologite. 2000. The role of computer support tools and gender composition in innovative information system idea generation by small groups. *Computers in Human Behavior* 16 (2): 111–39.

Kramer, D., P. Bigelow, P. Vi, E. Garritano, N. Carlan, and R. Wells. 2009. Spreading good ideas: A case study of the adoption of an innovation in the construction sector. *Applied Ergonomics* 40 (5): 826–32.

Lin, J-S. C., and P.-L. Hsieh. 2007. The influence of technology readiness on satisfaction and behavioral intentions toward self-service technologies. *Computers in Human Behavior* 23 (3): 1597–615.

Linder, J., and S. Cantrell. 2000. *Changing business models: Surveying the landscape.* Cambridge, MA: Accenture Institute for Strategic Change.

Locock, L., S. Dopson, D. Chambers, and J. Gabbay. 2001. Understanding the role of opinion leaders in improving clinical effectiveness. *Social Science and Medicine* 53 (6): 745–57.

Magretta, J. 2002. Why business models matter. *Harvard Business Review* 80 (5): 86–92.

Mansfield, G. M., and L. C. H. Fourie. 2004. Strategy and business models-strange bedfellows? A case for convergence and its evolution into strategic architecture. *South African Journal of Business Management* 35 (1): 35–44.

McAdam, R., and J. McClelland. 2002. Sources of new product ideas and creativity practices in the UK textile industry. *Technovation* 22 (2): 113–21.

Močnik, D. 2002a. The impact of electronic markets on product, industry, seller and consumer characteristics. In *IDIMT-2002,* ed. C. Hofer and G. Chroust, 47–58. Schriftenreihe Informatik 8. Linz: Trauner.

———. 2002b. Intermediation and electronic markets. In *Zbornik enajste mednarodne Elektrotehniške in računalniške konference ERK 2002,* ed. B. Zajc, 175–8. Ljubljana: IEEE Region 8, Slovenska sekcija IEEE.

———. 2004. Search efficiency on the Internet. In *Zbornik 7. mednarodne multi-konference Informacijska družba IS 2004,* ed. D. Trček, B. Likar,

M. Grobelnik, D. Mladenić, M. Gams, and M. Bohanec, 25–8. Ljubljana: Institut Jožef Stefan.

Morecroft, J. D. 1994. Executive knowledge, models, and learning. In *Modeling for learning organizations,* ed. J. D. Morecroft and J. D. Sterman, 3–28. Portland: Productivity Press.

Morris, M., M. Schindehutte, and A. Jeffrey. 2005. The entrepreneur's business model: Toward a unified perspective. *Journal of Business Research* 58 (6): 726–35.

Mumford, M. D. 2000. Managing creative people and tactics for innovation. *Human Resource Management Review* 10 (3): 313–51.

Mumford, M. D., and S. T. Hunter. 2005. Innovation in organizations: A multi-level perspective on creativity. *Research in Multi-Level Issues* 4:9–73.

Mumford, M. D., S. T. Hunter, and K. E. Bedell-Avers. 2007. Constraints on innovation: Planning as a context for creativity. *Research in Multi-Level Issues* 7:191–200.

Mumford, M. D., and B. Licuanan. 2004. Leading for innovation: Conclusions, issues, and directions. *The Leadership Quarterly* 15 (1): 163–71.

Nagumo, T. 2002. Innovative business models in the era of ubiquitous networks. NRI Papers 49, Nomura Research Institute.

Nakamoto, H., and M. Komeichi. 2006. IT road map toward 2010. NRI Papers 102, Nomura Research Institute.

Osterwalder, A., Y. Pigneur, and C. L. Tucci. 2005. Clarifying business models: Origins, present, and future of the concept. *Communications of the Association for Information Systems* 16 (1): 1–25.

Pateli, A., and G. Giaglis. 2004. A research framework for analysing eBusiness models. *European Journal of Information Systems* 13 (4): 302–14.

Porter, M. E. 1985. *Competitive advantage.* New York: Free Press.

Porter, M. E., and V. E. Millar. 1985. How information gives you competitive advantage. *Harvard Business Review* 63 (4): 149–60.

Prahalad, C. K., and M. S. Krishnan. 2008. *The new age of innovation driving cocreated value through global networks.* New York: McGraw-Hill.

Putra, A. E. 2008. Convergence and digitization. Http://agfi.staff.ugm.ac.id/blog/index.php/2008/11/convergence-and-digitization/.

Rappa, M. 2009. Managing the digital enterprise. Http://digitalenterprise.org/models/models.html.

Rode, C. 2000. In the eye of the beholder: visual and verbal cognitive capacities in complex problem solving. Working Paper, Think Tools AG.

Rosa, J. A., W. J. Qualls, and C. Fuentes. 2008. Involving mind, body, and friends: Management that engenders creativity. *Journal of Business Research* 61 (6): 631–9.

Sabherwal, R., and Y. E. Chan. 2001. Alignment between business and IS

strategies: A study of prospectors, analyzers, and defenders. *Information Systems Research* 12 (1): 11–33.

Schulze, A., and M. Hoegl. 2008. Organizational knowledge creation and the generation of new product ideas: A behavioral approach. *Research Policy* 37 (10): 1742–50.

Schumpeter, J. A. 1934. *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle.* Cambridge, MA: Harvard University Press.

Seddon, P. B., and G. P. Lewis. 2004. The case for viewing business models as abstraction of strategy. *Communications of the Association for Information Systems* 13:427–42.

Shafer, S. M., H. J. Smith, and J. C. Linder. 2005. The power of business models. *Business Horizons* 48 (3): 199–207.

Shapiro, C., and H. R. Varian. 1999. *Information rules: A strategic guide to the network economy.* Boston, MA: Harvard Business School Press.

Shiino, T. 2009. Using the ubiquitous network to achieve a sustainable society. NRI Papers 141, Nomura Research Institute.

Sirkin, H., J. Hemerling, and A. Bhattacharya. 2008. *Globality: Competing with everyone from everywhere for everything.* New York: Business Plus.

Stackpole, B. 2009. Virtual product development gaining traction: Advances in simulation, 3-D collaboration tools and CPU horsepowers are leading the charge. *Design News,* January 4. Http://www.designnews .com/article/161453-Virtual_Product_Development_Gaining _Traction.php.

Stähler, P. 2002. Business models as a unit of analysis for strategizing. Paper presented at the 1st International Workshop on Business Models, Lausanne.

Stiroh, K. J. 2001. Investing in information technology: Productivity payoffs in US industries. *Current Issues in Economic and Finance* 7 (6): 1–7.

Tidd, J., J. Bessant, and K. Pavitt. 1997. *Managing innovation.* 3rd ed. New York: Wiley.

Timmers, P. 1998. Business models for electronic markets. *Electronic Markets* 8 (2): 3–8.

Tsuji, T. 2006. Next-generation ubiquitous network strategy: Targeting living/urban space beyond distribution supply chains. NRI Papers 104, Nomura Research Institute.

Ushold, M., and M. King. 1995. Towards a methodology for building ontologies. Paper presented at the Workshop on Basic Ontological Issues in Knowledge Sharing, held in conjunction with IJCAI, Montreal.

Valacich, J. S., J. H. Jung, and C. A. Looney. 2006. The effects of individual cognitive ability and idea stimulation on idea-generation performance. *Group Dynamics* 10 (1): 1-15.

Vandermerwe, S. 1987. Diffusing new ideas in-house. *Journal of Product Innovation Management* 4 (4): 256–64.

Vidal, R. V. 2006. Roni Horowitz, How to develop winning new products ideas systematically. Book review. *European Journal of Operational Research* 174 (1): 1999–2000.

Westerlund, M., S. Kajalo, S. Leminen, and P. Petteri. 2007. Exploration or exploitation: Networking strategies in contemporary business models of smes. Http://ibacnet.org/bai2007/proceedings/Papers/2007bai7644.doc.

Yodokawa,K., and Y. Okochi. 2008. *Pragmatic approach to it-based management.* nri Papers 135, Nomura Research Institute.