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A Conceptual Framework and an Extended SOA Model for Consumer-Oriented E-Commerce

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1. Introduction

Value creation in e-commerce is dominated by business-oriented approaches. For example, the two basic types of e-commerce, B2B and B2C, aim at business cooperation or exchanges and increased sales, respectively. The tacit assumptions here are that business firms know (better) customers' needs and value comes for the business firm and the customer alike through the improvement of the business processes.

A shift in the conceptualization of value creation from business-oriented to consumer-oriented approaches is taking place gradually in the recent literature. The consumer is recognized as a "co-creator of value" and the business firm as a "service provider", which operates to provide benefit (i.e. "service") to the consumer. The value for the consumer derives from the combination of service elements that usually come from different providers, because of the complex nature and the diversity of people's needs. The role of the business firm is to support the consumer in creating value by enabling his participation in value creation and by producing products and services as the pre-conditions for value creation.

This chapter contributes in the development of consumer-oriented e-commerce, that is e-commerce models that focus on the needs of the consumer (the end-customer, the individual), by providing a conceptual framework and an extended SOA model. The purpose of consumer-oriented e-commerce is to empower the consumer in the creation of value according to his personal preferences and needs by composing service from different business firms. Consumer-oriented e-commerce is based on the conceptualization of service, which attracts multidisciplinary interest, and a consumer-oriented ideology that reverses the traditional, business-oriented value creation concepts. The conceptual framework considers service as a collaborative knowledge-based process for value creation. The extended SOA model suggests the use of SOA beyond operational practices for the integration of business processes and the interoperation of information systems and considers the strategic impact of SOA for the development of innovative business models in electronic markets. The extended SOA model can become the technological underlay for the composition of service

and value from different business providers and Semantic Web Services can become a key enabling technology in this effort.

2. An overview of customer-oriented concepts

In this section we review some consumer-oriented concepts that have been developed in the literature in business-related and IT-related fields, including service management, value creation, e-services, business ecosystems, enterprise architectures, SOA and Web Services and the Semantic Web and the Web 2.0., we analyse their meaning and evaluate their impact.

2.1. Consumer-oriented concepts in value creation

There is quite a lot of research recently that focuses on the concerns and the role of the consumer in economic transactions and promotes consumer-oriented concepts in value creation. All this research suggests that a paradigm shift is apparently under way in regard to the concept of value and the way it is created. The evidence of this shift is not clearly manifested in business practice yet, because it challenges deeply rooted theories of business management and suggests reconsidering the role of the business firm in the economic setting.

We can distinguish three approaches on value creation: a) the production-oriented approach, b) the marketing-oriented approach and c) the consumer-oriented approach.

The *production-oriented approach* conveys the traditional ideas of the manufacturing paradigm and expresses the notion of "value-in-production". Here emphasis is put on the role of the producer. The basic assumption is that the producer creates value, which is embedded in the product and becomes an attribute of it. The customer, on the other hand, consumes the value that has been created. As a result, each piece of product should normally contain the same amount of value and each customer should receive the same amount of value by consuming any piece of product. The value chain analysis is a key instrument of this approach, with value being added incrementally in each business activity that takes place along the intra-firm or the inter-firm value chain.

The *marketing-oriented approach* is an extension of the production-oriented approach that introduces the notion of "value-in-dissemination" and draws attention to the role of marketing in organisations as a means for the creation and dissemination of value. The marketing mix is the key instrument of this approach, with value being added on the total offering to the consumer through the successful manipulation of the "four P's". The product is still a container of value, but emphasis is put on the way that the firm manages to promote it, disseminate it and sell it.

A marketing-oriented organisation recognizes the significance of the customer, tries to understand the customer concerns, develops an interest for the customer (genuine or not) and tries to develop new approaches to become more responsive to the customer needs. Yet, value is still developed as business value. In other words, it is the business firm that recognizes customer needs, groups customers together and dictates how customer can satisfy their needs; it is the business firm that uses the acquired knowledge for the customer and develops marketing techniques to manipulate the customer choices. The role of the consumer remains passive and exogenous to value creation (Lusch et al., 2007).

The *consumer-oriented approach* introduces the notion of "value-in-use" by suggesting that value is created only when products or services are used by the consumer. The basic assumption here is that the consumers, not the business firms, have value-adding activities (Normann & Ramirez, 1993) and activity chains (Sawhney et al., 2003) and that the business processes create the pre-conditions for the creation of value. Value is, in fact, defined by the consumer during the selection of offerings, i.e. products or services, and created by the consumer during the consumption of the offerings. Business offerings have value to the degree that consumers can use them to leverage their own value. The role of the business firm is still important, but shifts from a "value creator" to an "enabler of value creation". According to Vargo and Lusch (2004), the firm can only make value propositions and then, if the proposition is accepted, to co-create value with the consumer. The consumer, on the other hand, becomes a "co-creator of value".

The concept that the consumer participates in the creation of value is well established in the literature (e.g. Normann & Ramirez, 1993; Prahalad & Ramaswamy, 2004; Zuboff & Maxmin, 2004; Von Hippel, 2006). Lusch et al. (2007) distinguish between value co-creation and value co-production; the former refers to the determinant and catalytic role of the consumer in the creation of value, while the latter refers to the supportive role of the consumer in the execution of business processes (e.g. in self-service settings, in design processes, in finishing products or services, etc.). Customer participation and co-production schemes are popular in the context of business-to-business collaboration; however, they are still a grey area in the relationships with the consumer and a question mark whether they truly serve the consumers needs. Customer self-service, for example, is frequently imposed on consumers in order to reduce operational costs, regardless of their willingness to do it. Even worse, customer self-service sometimes forms the basis for discrimination between customers, with the frequent or good customers being served by professional, while the others are doomed in the self-service mode.

The consumer-oriented approach in value creation generates a new situation for businesses and affects their relationships with the consumer. Some authors describe the new situation as the "relationship economy" or the "support economy" (Zuboff & Maxmin, 2004), with markets being transformed into "forums" (Prahalad & Ramaswamy, 2000), in which consumers can enter into dialogue about their needs with business firms and peers and synthesize individualized solutions that fulfil their needs.

2.2. Consumer-oriented concepts in service management

The development of consumer-oriented concepts found fertile ground in the field of service management and service marketing. The Service-Dominant Logic (Vargo & Lusch, 2004) and the Nordic School of service management (e.g. Grönroos, 2006) in particular endorse consumer-oriented concepts.

The Service-Dominant Logic has been recognized as a conceptual foundation for a service-based economy, as well as for the development of service science (Lusch et al. 2007b, Maglio & Spohrer, 2008, Spohrer et al., 2008). Service is defined here as the application of specialized competences (knowledge and skills) for the benefit of another entity (Vargo & Lusch, 2004). Hence, the fundamental unit of exchange in all cases is the application of specialized skills and knowledge, despite the fact that the embodiment of knowledge in tangible outputs creates the deceptive distinction between products and services. In essence,

all economies are service economies, because the exchange of knowledge and skills characterizes all economic activities (Vargo & Lusch, 2004).

According to the Service-Dominant Logic, value creation is based on service provision. Since the benefit from the service provision is manifested in the context of the customer, it means that what firms provide should not be understood in terms of outputs with value, but rather as inputs for a continuing value-creation process with and by the consumers.

The Nordic School takes a customer-oriented and relationship-focused perspective on business and considers that the concept of serving the customer should be spread throughout the organisation and embedded in all business functions. Service management seeks to understand the utility or value received by consumers in consuming or using business offerings and how services alone or together with physical goods contribute to this utility (Grönroos, 1990). A service management perspective changes the general focus of management in all firms from the product-based utility to the total utility in the consumer relationship. The focusing on the total utility, instead of more narrowly on the product-based utility, means that the value added for the consumers coming from other elements of the relationships with the consumer is considered equally important as the value that is intrinsic in the business offering.

Gummesson (1994) argues that the traditional division between goods and services is void. The business offering consists of many components, some of them being activities (services), some being things (goods). The consumer does not buy goods or services, but an offering, which renders service to the consumer and creates value for the consumer. As a result, we need to redefine our theories and develop them from a consumer perspective. The shift in focus to the concept of service is a shift from the means and the producer perspective to the utilization and the consumer perspective.

If the consumer-oriented concepts for value creation are right, then the business firms should reconsider their business models according to the concept of service and they should try to identify how to innovate with services and co-create value with the consumer. This is, in general, the purpose of service science (Chesbrough & Spohrer, 2006), which is conceived as a multidisciplinary effort to understand the nature of services, how they should be designed, produced and delivered and how to innovate in a service-based economy.

2.3. Consumer-oriented concepts in e-services

The bulk of services are data and knowledge intensive (e.g. consulting services, technical support services, healthcare, etc.). In addition, the composition, coordination and delivery of services for the consumer are data and knowledge intensive processes. Consequently, information technology and the Internet have great significance in a service-based economy.

The term e-service is not defined precisely in the literature. Rust & Lemon (2001) consider that the term is used in general to denote transactions in which information is the primary value exchanged. Gronroos et al. (2000) claim that e-service is any product or service that is exchanged over the Internet. Others restrict their scope on services that are delivered electronically (Javalgi et al. 2004) or over electronic networks (Rust & Kannan, 2003).

Assuming that e-service is based on the concept of service, as presented in the previous section, then it has all the attributes of the service and it is consumer-oriented, too. Information technologies and the Internet are supposed to favour consumer-oriented concepts, because they provide more consumption and transaction options to the consumers. Besides, the consumers can obtain more and better quality information for the

various options they have and they become more knowledgeable and, therefore, more powerful. The Internet tends to shift bargaining power to end consumers in their transactions with businesses (Porter, 2001), because it allows the end consumer to get in contact directly with a great number of producers. In certain cases, disintermediation becomes so extensive that consumers acquire access to services that were used to be available only to professionals. For all these reasons, the information technologies and the Internet tend to enable the consumers to play an active role in the selection and composition of service according to their personal preferences and needs and in the creation of value for themselves.

Another source of benefit comes from the decreased cost of customization of digital services, which makes selling customized services economically feasible, even in small market segments. The concepts of "mass customisation" (Gilmore & Pine 2000), "one-to-one marketing" (Peppers et al., 1999) and "long tail economics" (Anderson, 2006) are based on the premise that, with the support of the information technologies, business firms are able to target each consumer separately, personalise their services and disseminate them efficiently. Information technologies enable also the business firms to interact and build relationships with consumers with the use of a variety of channels. As far as the communication with consumers becomes more flexible and less expensive, it is easier for the business firm to provide personalised information and service to different consumers.

2.4. Consumer-oriented concepts in business networks and ecosystems

In traditional business thinking, value creation in considered a linear business function, with the one firm passing its output to the next link along the supply/ value chain, until the consumer. However, as customer needs become more complex and varied, so do the products or services and the processes that are required to produce them. Linear relationships are no longer effective because a variety of inputs from different producers are fused simultaneously in the production process.

Network structures have been developed as a means for the collaboration of a great variety of business firms, including partners, allies, suppliers and consumers. The underlying goal of these networks is to work together to co-produce value by creating an improved fit between business competencies, on the one hand, and customer needs, on the other. In business networks, the focus shifts from the supplier to the whole business network as an entire value-creating system.

We can distinguish between business-oriented networks and customer-oriented networks; the former are created to support business objectives mostly, such as the need for efficiency, and tend to be organised in long-standing structures, such as business alliances; the latter are created to serve the increased and specialized customer needs and may be organised either in stable structures or in a per-project basis. Virtual organisations, for example, are temporary networks that are formed to execute a specific project according to the requirements of the customer. In customer-oriented networks, the role of the customer is outstanding, because the business network in developed to respond to his special needs, which should reflect on the purpose, the structure and the operations of the network.

In the literature we can find different kinds of business networks, such as business constellations (Normann & Ramirez, 1993), extended enterprises (Prahalad & Ramaswamy, 2003), value nets (Bovet & Martha, 2000), virtual enterprises (Sawhney & Parikh, 2001;

Walters & Lancaster, 1999), strategic networks (Jarillo, 1988) and business ecosystems (Moore, 1996; Iansity & Levien, 2004).

The concept of business ecosystem is a metaphor that steps forward the movement towards symbiotic and co-evolutionary business networks. The business ecosystem is an economic community comprised of a number of interacting organisations and individuals, including suppliers, producers, competitors, consumers and other stakeholders, that produces goods and services of value for the consumers (Moore, 1996). All the entities in a business ecosystem are interconnected to each other, in a sense that they have an affect on each other. Business ecosystems propose a holistic way to examine the business enterprise and its relationships with its environment, showing concern for all the stakeholders.

Business ecosystems can be thought as a sophisticated kind of business network, with several advantages over other forms of business networks. For example, business ecosystems concentrate large populations of different kinds of business entities. They transcend industry and supply chain boundaries and assemble a variety of organisations that can complement each other and synergistically produce composite products. Interdependence and symbiotic relationships are inherent attributes in business ecosystems; as a result, the participants counter a mutual fate and co-evolve with each other. But in parallel, members compete with each other for the acquirement of resources and the attraction of consumers.

Fragidis et al. (2007) believe that the role of the end customer is undervalued in business ecosystems and propose a conceptual model of a customer-centric business ecosystem. It is a constellation of other business ecosystems and individual business entities that are dynamically developed around the customer, according to his/her preferences and needs. Connections among business entities are flexible and temporary and dissolve after the fulfilment of the customer needs. Public administration agencies are included in the customer-centric business ecosystem, too, because they perform activities that either add value directly or regulate the provision of products or services from the business partners.

2.5. The consumer-oriented potential of Web technologies

Consumer-oriented e-commerce cannot be developed unless there are the necessary Web technologies for this. Here we examine the capability of Service Oriented Architectures (SOA) and Web Services, which are considered the basic organizing paradigm and technological method, respectively, for the development of Internet-based business systems, to serve as the technological foundation for the development of consumer-oriented e-commerce models.

A SOA is a paradigm that is based on the concept of service for the organization, use and delivery of business functionality. The OASIS Group defines SOA as a powerful framework for matching needs and capabilities and for combining capabilities to address those needs (OASIS, 2006). Services in SOA are defined in a similar way to the definition of service in the business world, that is as deeds performed by the service provider for the benefit of the service client. In other words, the service provider has some capabilities that are expressed as services and get invoked by the service client in order to satisfy their needs. Consequently, from a conceptual point of view, SOA could be used to provide the technological foundations that are required for the empowerment of consumers in the selection, composition and consumption of products or services in electronic markets.

It is acknowledged that the philosophy of SOA is to be used in business environment to support the execution of business-to-business transactions. The major concern is the execution of business processes, resulting in the development of interoperability along the supply chain, the enhancement of the reusability of software resources and the achievement of organizational agility, defined in terms of flexible business transformation and costless development of new business processes. If SOA are going to be technological foundations for the development of consumer-oriented e-commerce models, then some enhancement is required in the typical SOA model.

From an operational point of view, a SOA can be implemented with the use of Web Services. The basic Web Services model endorses three roles (service requestor, service provider and service registry) and three operations (publish, find and bind). Web Services follow the "find, bind and invoke" paradigm, where a service requestor performs dynamic service search by querying the service registry for a service; if the service exists, the registry provides the requestor with contact details for the service.

Such an operational model is clearly consumer-oriented and could support consumer-oriented value creation. The service requestor recognizes some need, searches for solutions, makes the selection, invokes the service and composes it with other services in his own context, in order to create value for him. Hence, value creation is performed by the service requestor. The service provider has a passive and supportive to the requestor's value adding activities role; the service provider creates services that will be used by service requestors and disseminates them through intermediaries. The model includes intermediaries that support also the customer in creating value, by collecting a great array of services from different providers and providing information for their functionality, invocation and use. The OASIS Reference Model for SOA makes the distinction between the provider of the capability and the provider of the service that enables access to that capability (OASIS, 2006), which means that the provider of the service can be an intermediary, while the provider of the capability is the producer.

2.6. Consumer-oriented concepts in the Web 2.0 and the Semantic Web

The Web 2.0 and the Semantic Web are emerging phenomena that promise to exercise great impact on the future of e-commerce. In general, they are both distinguished by the belief that the Web technologies are moving to a next level of sophistication and by the ambition to revolutionize the way that people interact and transact on the Web. However, their definitions are still vague -or even equivocal- and their potential to bring significant business effects and concrete outcomes remain to be proved in practice.

Even though the term "Web 2.0" has received several interpretations by different people, the definition of O' Reily (in Musser, 2006), that it is a set of economic, social and technology trends that are based on user participation, openness and network effects, seems to be a common place. It is beyond doubt that consumer-oriented concepts can easily grow in such an environment. For instance, the most well-known success stories of the Web 2.0 (e.g. Wikipedia, Facebook, YouTube, etc.) are based on the concept of user participation. In all these cases, instead of business-generated content we see user-generated content; the users contribute directly or indirectly and collectively co-create content or experiences. The users are not only consumers, but also co-developers; they do not expect passively the fulfilment of their needs by the business firms, but they participate actively in the development of the products and services that meet their needs. Their motives for participation are related with

their needs to be heard by business firms, to create products, services and websites that fulfil their personal interests, to tailor offers according to their preferences, to experiment, learn and gain experiences, to contribute to the community, to offer to their peers and to communicate and share with the others.

The success of the Web 2.0 thus far, even though it is based on some new technologies (e,g, Ajax, Java, REST, RSS, mashups, etc), doesn't come solely from them. We consider that the success of the Web 2.0 stems from the development of a new business mentality that prioritizes users' needs and favours customer participation and co-creation. The question is whether this new consumer-oriented mentality can be transferred beyond the creation of content and entertainment activities to become a universal mode of transactions on the Web. The Semantic Web, sometimes referred to as the "Web 3.0", was initially conceived as a virtual environment in which "a customer's value chain is dynamically created on the Web [with the support of] intelligent agents that collect Web content from diverse sources, process the information and exchange the results with other agents, each one adding value, to construct the final product requested by the end-user" (Berners-Lee et al., 2001). In other words, it implies that the consumers have, in fact, value-adding activities and the Semantic Web aims to support the consumer in the composition of personal solutions through the facilitation of mediating software agents. Therefore, the Semantic Web fosters in principle consumer-oriented concepts in value creation and could support the development of innovative business models regarding the role of consumers, providers and intermediaries. Nonetheless, the use of intelligence in order to manipulate the consumer, instead of supporting him, seems to be a strong temptation that can derail the Semantic Web from the consumer-oriented route. In a later section we discuss how we can exploit the semantics that the web services carry and what the expected benefits are in case we employ such a solution.

3. A conceptual framework for consumer-oriented e-commerce

The traditional business thinking is dominated by business-oriented concepts that emphasize the role of the producer. The development of e-commerce followed in the first stages this business-oriented tradition and sought to transfer the established business models from the physical to the digital world. However, as presented in the previous section, there is some evidence, both in the literature and the business practice, that the customer or the consumer has an important role in value creation. The Web technologies seem to have come to such a level of sophistication that they can support the development of innovative e-commerce models that are based on consumer-oriented approaches in value creation. Under these circumstances, it seems that we have reached to a maturity level for the development of consumer-oriented e-commerce models.

Consumer-oriented e-commerce cannot be another buzzword or a marketing trick that deceptively claims to serve the consumer's needs, while focusing on the business interests and pursuing to manipulate the consumer. Consumer-oriented e-commerce is a true opportunity for the business firms that wish to exploit the Web for the development of innovative business models in engaging the customer in business operations and empowering him in creating value. Some of the key characteristics of consumer-oriented e-commerce must the following:

- The role of the consumer is to participate and contribute in business operations and – most of all- to create value by composing offerings from one or different providers. The consumer is not an object, but the subject of the value adding processes.
- The role of the provider is to provide service to the consumer and support the consumer in participating and in creating value. Products and services are the pre-condition for value creation. The provider cannot have a better knowledge on the customer needs, which deprives him from the right to make the choices on behalf of the consumer and dictate consumption solutions.
- Business offerings are developed in a modular way and according to open models, so that the consumer can make choices and compose solutions from different providers.
- The distinction between B2C and C2C models is not important anymore. The important is who uses the value and how does it. Value creation takes place by composing elements from different sources, either by professionals or peers, either for money or free of charge.
- The composition of solutions and the creation of value for the consumer require support by specialized intermediaries that facilitate finding of the business offerings, evaluating and selecting the best alternatives, composing consumption solutions and coordinating the business processes that produce the required value. The role of such intermediaries in consumer-oriented e-commerce will be similar to the role of search engines in the Web.

A conceptual framework for consumer-oriented e-commerce can be based on a service-based view of business and, in particular, on the concept of service as a collaborative knowledge-based process for value creation. The concept of service as an activity that somebody does for the benefit of somebody else offers the right basement for this effort. First of all, the concept of service is value-oriented and customer-oriented, because the provider's activity is important only if it creates benefit for the receiver. In addition, service is a universal concept that covers all kinds of business offerings, including both tangible products and intangible services, because the purpose of every business offering is to bring some benefit to the customer; hence, business offerings are considered as service elements. Moreover, the concept of service can serve as the basis for a universal business model that includes the aspects of both the provider and the consumer; from the provider's point of view, service can be defined as a business process, while from the consumer's point of view, service can be defined as benefit and value. A service system, then, is not only a structure for the execution of business activities, but for the participation of the customer in the creation of value, as well. At last, service is information and knowledge intensive, which makes the development of innovative service-based e-commerce models an opportunity.

Since the basic conceptualization of a service is an activity that somebody does for the benefit of somebody else, then a service can be defined by the roles of the provider and the consumer and by the benefit or value that is delivered to the consumer. The role of the consumer is the primary in a service interaction; the consumer not only determines what has value and evaluates the value potential of the service elements, but creates value as well, by executing activities and by selecting and composing service elements. The provider, on the other hand, is an enabling factor for value creation by the consumer, by providing the service elements as the pre-condition for value creation by the consumer.

The importance of knowledge in service interactions is well-presented in the literature, where service is generally thought as the application of resources and specialized

competences by the provider for the benefit of the consumer. However, this notion of service emphasizes the role of the provider, as it considers that the knowledge resides in the provider's side. Here we claim that the consumer, as the deciding evaluator of the value potential of service elements and the final integrator of service elements, performs knowledge-intensive functions, too. The consumers create value idiosyncratically, in the context of their own lives and according to their needs, and tend in general to integrate a variety of service elements, in order to tailor valuable outcomes that can satisfy their needs. in other words, service elements are the "resources" that the consumers use in their value creation processes. Both the selection of service elements in the first place and the integration of service elements thereafter are knowledge-based processes for the consumer.

Value creation is a collaborative knowledge-based process, both for the consumer and the producer, in which the former integrates the benefits provided by the latter. Value creation is a collaborative process because the consumer cannot receive input and create value without the support of the producer; the producer, on the other hand, does not enter into business activities, unless they are going to be consumed. Value creation is a knowledge-based process for the consumer because the selection and composition of services is based on their knowledge for the uses, the qualities and the benefits of the available options, as well as their past experiences. It is a knowledge-based process for the producer, as well, because knowledge is a key resource for all the business functions. Hence, service systems are normative structures that facilitate the collaborative knowledge creation and advancement (i.e. improvement of existing knowledge) between the customer and the provider.

Knowledge is also a basic type of the benefit for both the consumer and the producer, because their current decisions and functions are based on the knowledge they acquire now or have collected in the past from their participation in similar situations. In this setting, the role of knowledge is twofold: on the one hand it represents business capability that delivers benefit to the customer; on the other hand, it is an integral part of the benefit delivered to the customer, contributing to the creation of value by the customer, either directly or indirectly (i.e. by leveraging to customer's opportunities for value creation). Hence, provider's knowledge (business knowledge) is an enabling factor for value creation; customer's knowledge, however, being either proprietary though personal experiences or obtained through service, is the key determinant of the created value. Proprietary knowledge, in particular, allows for the creation of value ("added value") for the customer through the consumption of service elements and the integration of the benefits they provide.

4. An extended SOA model for consumer-oriented e-commerce

The development of models of consumer-oriented e-commerce requires an extension in the typical SOA model, so that the outputs of the business processes become visible to the consumer, who will be able to select and combine business services to create value. In this section we propose an extended SOA model for consumer-oriented e-commerce and outline the key conceptual requirements for the development of such a model.

4.1 The architecture
The extended SOA model for consumer-oriented e-commerce is based on the technological foundations of SOA and complements them by introducing two additional layers on top of

it, in order to connect business processes with their outcomes and the needs of the consumer. The model is depicted in Figure ure 1.

The model is comprised of two parts:

a) *A business-oriented part*, which refers to the typical SOA model. This part is the technological underlay for the composition of products or services and the creation of value for the consumer, through the orchestration, execution and management of Web Services.

b) *A consumer-oriented part*, which refers to the extension that introduces the consumer's perspective in the composition of services and aims to support the consumers in the creation of value and the satisfaction of their needs.

The extended SOA model for consumer-oriented e-commerce is developed in five layers: the application layer, the Web Service layer, the business process layer, the business service layer and the consumer need layer. The first three layers refer to the business-oriented part and the next two layers refer to the consumer-oriented part of the architecture.
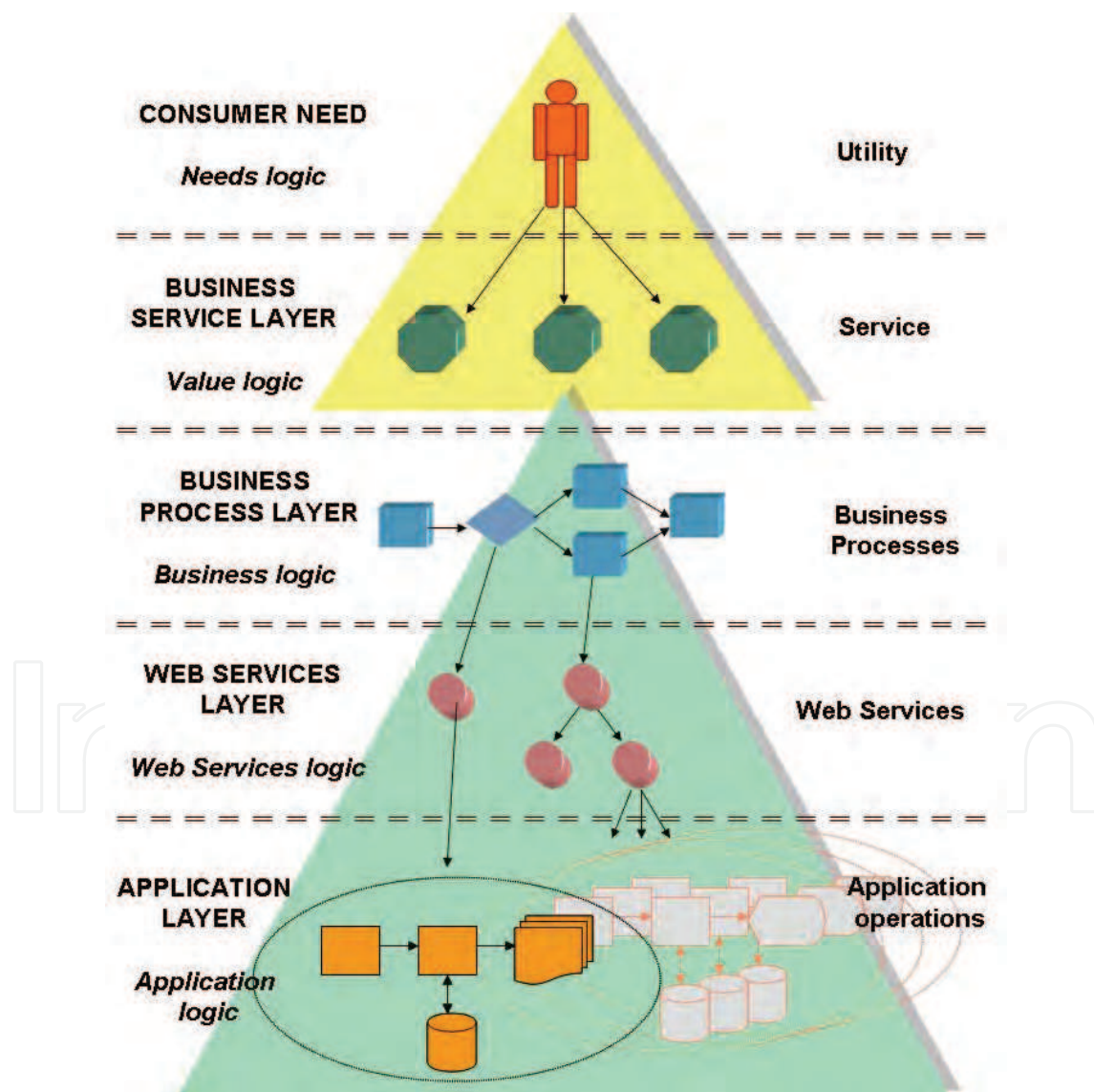
Fig. 1. An extended SOA model for consumer-centric e-commerce

The Application Layer contains all the IT infrastructure and IT resources that support business operations. This level is dominated by the "application logic" for the automated or in general IT-supported execution of business processes.

The Web Service Layer contains the Web Services that join together business functionality and application operations and allows for the flexible combination of application operations for the development and execution of business processes. This level is dominated by the "Web service logic", as it is described by the service-orientation principles for the design, advertising, invocation, composition and execution of services.

The Business Process Layer refers to the business processes that are performed for the production of products or services. This level is dominated by the "business process logic" for the analysis of processes into activities and tasks. In service-oriented environments, activities and tasks are mapped into Web Services (at the Web Service layer), which call and orchestrate the execution of application operations (at the application layer).

The Business Service Layer refers to the service (i.e. benefit) that is provided to the consumers by the business firms through their business processes for the satisfaction of their needs. The concept of service here includes both products and services that are produced by business firms as the pre-conditions for the creation of value for the consumer. This level is dominated by the "value logic" (i.e. consumer value logic) that aims to enable consumers to participate in the value creation processes by combining together complementary standalone products or services from one or different business providers and by creating unique solutions that can meet their problems and satisfy their needs.

The Consumer Need Layer refers to the needs of the consumers. This level is dominated by the "need logic" that extends beyond consumption and dictates the satisfaction of consumer needs. The basic assumption here is that needs motivate consumers to take products or services from business providers, aiming at the benefit they will obtain from their consumption. Moreover, as consumer needs tend to be quite complex and diverse, they can be satisfied by the consumption of compositions of different product or services.

4.2 Key conceptual requirements of the model

The extended SOA model for consumer-oriented e-commerce is designated to support the composition of products or services from different providers according to the consumer's preferences and needs. Such functionality is analogous to the composition of Web Services in a SOA for the execution of the business processes and the fulfilment of the business needs. Hence, the general idea of the proposed model derives from the example of SOA, accompanied by an anticipated market opportunity to develop consumer-oriented models that keep an active role for consumers in the creation of value. The practical use of the proposed framework requires that it is developed similarly to the SOA framework, with business service (i.e. products and services) being analogous to Web Services.

In this section we are based on the OASIS Reference Model for SOA [] to provide the key concepts and relationships that serve as a guideline for the development of the extended SOA model for consumer-oriented e-commerce. Additional concepts, not provided in [], are the solution, the need and the need description. The relationships between these concepts are provided in Figure 2. Concept mapping notation is used, with concepts represented as ovals and relationships represented as arrowed lines pointing at the concept that has some kind of conceptual dependency (e.g. derives from, is implemented by, etc.).

Extended SOA Model for consumer-oriented e-commerce	OASIS Reference Model for SOA
Service	Service
Service description	Service description
Visibility	Visibility
Consumption	Interaction
Intermediation context	Execution context
Consumption effect	Real world effect
Contract and policy	Contract and policy

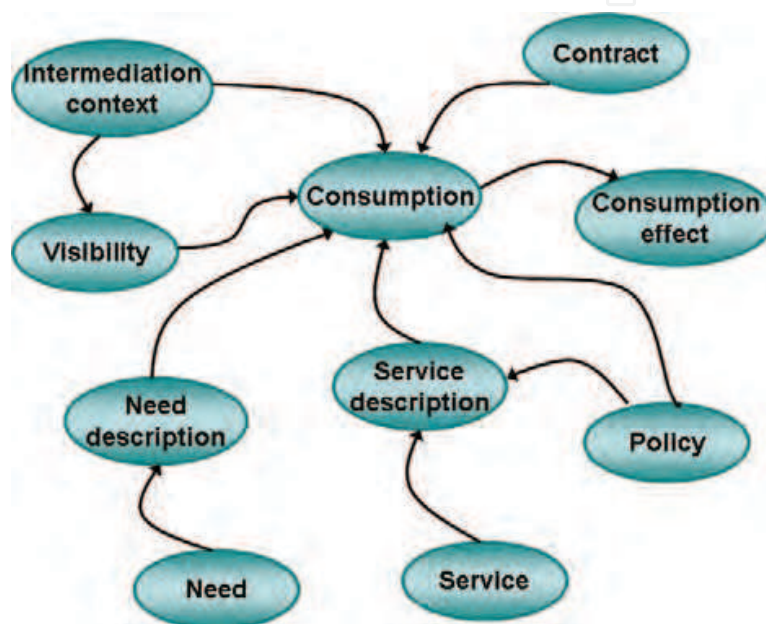Table 1. Key concepts of the extended SOA model for consumer-oriented e-commerce

Fig. 2. Key concepts of the extended SOA model for consumer-oriented e-commerce

Service. It refers to the concept of service as the benefit that is provided to the consumer through the execution of business processes. As explained elsewhere, service elements include both products and services. Service is analogous to Web Services in SOA. Note that service has a dual character, as it refers to both the outcomes of a business process and the benefit for the consumer. Thus, the concept of service is the bridge that connects consumers and providers and enables a dialogue for the creation of value for the consumers. The composition of business service into solutions produces added value for the consumer; *solutions* are compositions of products and services.

Other basic principles of SOA, such as granularity, loose coupling and separation of concerns, apply in the extended SOA model for consumer-oriented e-commerce as well. Service can be defined in any level of granularity, with single and simple service elements becoming parts of more compound service elements (e.g packages). A need may be satisfied by different service elements, depending on the profile and the preferences of the consumer, while the same service element may be used by different consumers to serve different needs. Consumers are interested in the benefit or utility they receive and overlook the details of the business processes; the opposite is true for business providers, who are not involved in the value creation and the consumption process of the consumers.

Service description. The discovery, selection and composition of service elements are based on their descriptions. Being a manifestation of the benefits that can be delivered from the consumption of services, service descriptions are the basis for matching services with consumer needs and for the development of consumption solutions. Note that business services are difficult to be fully described, because of the great variety of their attributes and functionality. For this, the exact structure of business service description must be adapted on the specific business or market domain. The business service description should be expressed both in text and in machine-processable format. The use of semantics is necessary and a domain ontology (or a set of ontologies) will support the common definition of the terms used.

With this in mind, we consider that any business offering description should include at least the following: a) general attributes (e.g. physical characteristics), b) functional attributes (e.g. uses, requirements), c) operational attributes (e.g. delivery details), d) price (e.g. price, discounts), e) effects (the results that can be achieved as a result of the their consumption. E.g. arriving at one place.), and f) policies (e.g. validity of offers, constraints, liability, warranty, etc.).

Need. It is a want or a problem of the consumer that must be satisfied or resolved. A need refers to what the consumer wants to be achieved through the use of services.

Need description. It supports the discovery of suitable business services and their composition into solutions that can meet consumer needs. Needs description is difficult because consumer needs tend to be vague. Need descriptions must be domain-specific, such as business offering descriptions, because different market domains are expected to be related with the satisfaction of different needs. In addition, need must be described in a formal way to enable intelligent support in the service discovery and matching process.

Visibility. It refers to the requirements of achieving contact and interaction between consumers and providers in order to enable the consumption of service and satisfy consumers' needs. Visibility here has, in general, the same meaning and significance, as in the OASIS Reference Model for SOA. Visibility and its preconditions (i.e. *awareness*, *willingness* and *reachability*) are supported by the role of intermediaries. Unlike registries in SOA, which have a limited role and serve usually as simple repositories, the intermediaries in a consumer-oriented e-commerce model should have a key role in the discovery, the evaluation and the composition of services, as well as in the orchestration and management of the business processes of the different service providers. Note that the intermediary is a business role, not a technology. Besides, it is consumer's agent in the composition of solutions, not a retailer of products and services.

Consumption. It refers to activities that enable the use of a service for the satisfaction of a consumer need. Such activities are the selection and composition of services from the consumer and the activation and coordination of business processes at the provider's side from the intermediary. The concepts of *interaction*, *execution context* and *service interface* defined in [10] refer to the technical details of using Web Services for the interaction between the intermediary and the business suppliers and the execution of business processes. The *intermediation context* refers to the systems and technologies used, the policies applied and the processes followed by the intermediary for the execution of its role and the interaction with the consumer and the business provider.

Consumption effect. It refers to the outcomes for the consumer from the consumption of services. Note that, while the service description gives the provider's outlook on the

outcomes of the consumption of services, the consumption effects refers to the way the consumer perceives these outcomes. Verbal descriptions provided by the consumer, rating systems, unstructured ways of capturing information and, in general, technologies that attempt to capture consumer's disposition and feelings will be useful in this effort.

Policy. A policy represents some constraints or conditions on the delivery and consumption of services. It can be imposed by the business provider or the intermediary (or both).

Contract. A contract refers to any bilateral or multilateral agreement of the consumer, the intermediary and the business provider for the delivery and consumption of services. A contract usually includes the policies.

5. Semantic web services in consumer-oriented architectures

So far we have discussed and establish both an architecture and a conceptual framework for supporting consumer oriented web services. Using the conceptual model we can identify the semantics each concept brings either by its meaning or through the relationships with the rest of the concepts. We can then try to identify the semantics carried or needed by the different layers of the architecture and discuss how we can exploit them in order to provide a smoother experience for the customer. It should be noted here that although we advocate the responsibility of the customer for the selection, the composition and final exploitation of the services' results by the customer this is neither an easy nor a trivial task.

The first thing that the customer would try to do in a web service environment would be to try and "understand" what each service that is available in the ecosystem brings into the picture so as to evaluate its suitability for the task at hand. This means that the customer should understand the semantics of the process that will take place in order to solve the problem at hand (process semantics) (Kashyap et al., 2008) and the individual semantics that each service carries, since a process might be fulfilled by composing more than one services together. Moreover the customer would need to understand in various cases what the data that a service needs/uses /produces might mean either as the output of a process or as an inut for the process to follow (data semantics) (Kashyap et al., 2008). On the other hand there is a wealth of languages that support services' description (e.g. WSDL – W3C, 2009), discovery (e.g. UDDI – OASIS, 2004), composition and orchestration (BPEL – OASIS, 2007). But these languages cannot be used as such by the customer, since they are mostly oriented towards machines and try to automate the overall process. Nevertheless this is not the basic deficit that we can identify, this would be the fact that consumers would not be able to use these languages because these languages carry no semantics about the service itself, they just describe in computer terms what to expect as a result and how to do the composition or orchestration. Finally, usually the users appreciate the chance to annotate the Web Services (Kungas & Matskin, 2007) that exist in order to be able to identify them later and exploit their annotations. Using ontologies or other conceptual schemas that carry semantics is a common annotation technique and is easily understandable by both humans and machines and thus highly appreciated in a consumer oriented environment (Seth et al., 2005).

So in order to make things more concrete we can identify Semantic Web Services as web services that are described under a common schema (aka conceptual model) and provide the necessary affordances to exploit semantic web tools to search, compose and annotate these services (Cardoso & Seth, 2006). Moreover the consumer would be able to understand that conceptual model and find the services whose semantics match (are closer) to the

understanding about the problem at hand. With the current explosion of the semantic web many services and data already carry these semantic descriptions; data being semantically described at a greater extend than services. Additionally a wealth of tools ranging from query languages like SPARQL (W3C, 2008) and RQL (Karvounarakis et al., 2004) to frameworks (JENA, 2009) and ontologies (WSMO, 2222) is already available to support discovery (by querying), adaptability (by evolving) and composition (by merging and matching) of web services described according one or more conceptual models.

Finally, one interesting property of the Semantic Web Services for the consumer is the fact that there are already tools that can support the consumer's conceptual model (or the value-logic of the consumer as we described it earlier) and can compare it to the conceptual model of the system, i.e. the services. Thus we can find mappings between the two models and better identify the web services that fit the value-logic of the consumer. As already mentioned if this is coupled with the capabilities of conceptual models and semantics to evolve (and thus to adapt to the changes of consumer's perspective on the value of the services), we can understand that we have at hand a powerful tool that can help the consumer better understand the value of services and thus maximize his overall benefit but also allow the user to do that over time (Kotzinos et al., 2008) in a seamless and fairly easy to understand and handle way.

If we look closer to the layers identified for the extended SOA model for consumer-centric e-commerce we can already identify the layers where the semantics have a role to play and can be further enhance the consumer's capabilities. The first layer of interest is, as expected, the Web Services Layer, where we can substitute the more traditional web service descriptions with semantically rich ones and then use the corresponding semantic web tools to search for, choose, compose and orchestrate the web services basing the consumer's understanding either on the process or the data semantics. The second layer of interest is the Business Process Layer where we can exploit the process semantics identified in the previous (Web Services) layer. Since processes and tasks carry semantics and they are mapped into web services (or series of web services) we can exploit the semantics described under a common conceptual model to provide better mappings that are understandable by both humans and machines, moreover we can reason on these descriptions to infer new knowledge from that and further enhance the consumer's experience.

The last layer of interest would be the Business Service Layer where the consumer would be able to harvest most of the advantages of the semantics. There we can provide mappings or (in a weaker sense) understandings between the consumer's "value-logic" model and the value produced by the services. Thus the consumer would have the capability to bring closer to his own understanding the meaning of the services and the produced results. Moreover the consumer would be able to exploit his own or other consumers' annotations on the services, supporting and extending the understanding but also supporting and extending the mappings that would allow him to make a safer choice. This means that we can see the situation that each consumer would bring in his own conceptual model about the (expected) value of the processes and try to match that to the service semantics that would be used to serve this process. This makes the whole model almost infinitely (in terms of concepts, the complexity of course might hinder such unconstraint extensions) extensible and provide the consumer with the ability to keep his own understanding and value model and match it against the one(s) the services carry. Moreover it allows for evolution on both

parts: consumer and services can evolve their semantics without having to change things on either side.

6. Future research

Consumer-oriented e-commerce is an opportunity for the creation of innovative models that engage the consumer in business operations and empower him in creating value. Future research for the development of consumer-oriented e-commerce should be related to both the development of a consumer-oriented theoretical framework and the development of the necessary technological infrastructure.

This chapter makes a preliminary contribution for the development of a consumer-oriented theoretical framework. Here emphasis is put on service as a collaborative knowledge-based process for value creation, which is a dense concept that needs to be analyzed and elaborated further. Future work should try to exploit further the concept of service; here some service-based theories, such as the Service Dominant Logic and the Nordic School of service management, and trends, such as the development of the service science, can have a great contribution. Another stream of future research comes from the development of typical models for consumer-oriented e-commerce; such models will derive from the critical analysis of business practices that adopt consumer-oriented approaches (e.g Web 2.0).

The extended SOA model presented in this chapter can become the conceptual platform for the implementation of consumer-oriented e-commerce models. First of all, it is necessary to refine the extended SOA model by adopting elements from sources other than the SOA Reference Model. For example, other reference models or particular architectures that claim to be customer-oriented could provide further input. The implementation of consumer-oriented e-commerce models requires the definition of a set of available technologies; thus, it is necessary to find out which of the existing technologies are suitable for this at each level of operations and what kind of amendments are necessary. Emphasis will be put on the technologies that are required for the expression of consumer needs and business services, as well as for the composition of business services. It is necessary to suggest extensions to the currently available web services and business processes languages and the corresponding conceptual models (ontologies) like the ones mentioned earlier that would allow us to bring into their semantics consumer oriented semantics (both concepts and relationships) and also propose additional composability operators based on those semantics. At last, pilot implementations and case studies will provide further knowledge and will contribute in the improvement of both the theoretical models and the practice.

7. Conclusion

This chapter presented some current, customer-oriented trends in the conceptualization of value creation, according to which the consumer is not a passive receiver and a plain evaluator of value, but becomes the utmost determinant and an active co-creator of value. These ideas suggest that there is an opportunity for the development of innovative business models in engaging and empowering the customer in co-creating value. The Web can be an extremely fertile field for the development of consumer-oriented e-commerce, because the new Web technologies can support innovative ways in the interaction with the customer and they can enable the participation of the customer in value co-creating activities.

This chapter contributes in the development of consumer-oriented e-commerce by providing a relevant conceptual framework and an extended SOA model. The purpose of consumer-oriented e-commerce is to empower the consumer in the creation of value according to his personal preferences and needs by composing services from different business firms. Being based on the concept of service as a collaborative knowledge-based process for value creation, the conceptual framework provides the theoretical background for the development of consumer-oriented e-commerce models. The extended SOA model complements the OASIS Reference Model for SOA, on which it is based, by introducing the consumer's perspective in the composition of business services and in the creation of value. Hence, SOA can become the technological underlay for the composition of service and value from different business providers and Semantic Web Services can become a key enabling technology in this effort.

Even though there are some consumer-oriented ideas in the literature and the existing technologies have apparently the required properties for the development of consumer-oriented e-commerce models, it will be neither straightforward nor imminent, because it has to prevail beforehand over the traditional, egocentric business thinking.

8. References

Anderson C. (2006). *The Long Tail: Why the Future of Business is Selling Less of More*, Hyperion, ISBN 1401302378, New York.

Berners-Lee T., Hendler T.J. & Lassila O. (2001). The Semantic Web, *Scientific American*, Vol. 284, 34–43.

Bovet D. and Martha J. (2000). Value nets: reinventing the rusty supply chain for competitive advantage, *Strategy & Leadership*, Vol. 28, No 4, 21 – 26.

Cardoso J. & Seth A. (eds) (2006). *Semantic Web Services, Processes and Applications*, Springer, ISBN 0-387-30239-5, USA.

Chesbrough H. & J. Spohrer (2006). A research manifesto for services sciences, *Communications of the ACM*, Vol. 49, No. 7, 35-40.

Fragidis G., Tarabanis K. & Koumpis A. (2007). Conceptual and Business Models for Customer-Centric Business Ecosystems, *IEEE International Digital Ecosystems and Technologies Conference (DEST)*, Cairns, Australia, 21-23 February, 2007.

Gilmore J.H. & Pine B.J. (2000). *Markets of One: Creating Customer-Unique Value through Mass Customization*, Harvard Business School Press, ISBN 978-1578512386, Boston Massachusetts.

Grönroos C. (2006). Adopting a Service Logic for Marketing, *Marketing Theory,* Vol. 6, No. 3, 317–333.

Grönroos, C. (1990). Service management: A management focus for service competition, *International Journal of Service Industry Management*, Vol. 1, No. 1, 6–14.

Grönroos, C. Heinoner, F. Isoniemi, K. & Lindholm, M. (2000). The NetOffer model: a case example from the virtual marketspace, *Management Decision*, Vol. 38, No. 3/4, 243-252.

Gummesson E. (1994). Service Management: An Evaluation and the Future, *International Journal of Service Industry Management*, Vol.5 No. 1, 77-96.

Iansiti M. & Levien R. (2004). *The Keystone Advantage: What the New Dynamics of Business Ecosystems Mean for Strategy, Innovation and Sustainability*, Harvard Business School Press, ISBN 978-1591393078, Boston Massachusetts.

Jarillo J. C. (1988). On Strategic Networks, *Strategic Management Journal*, Vol. 9, No. 1, 31-41.

Javalgi, R.G., Martin C.L. & Todd P.R. (2004). The Export of E-Services in the Age of Technology Transformation: Challenges and Implications for International Service Providers, *Journal of Services Marketing*, Vol. 18, No. 7, 560-573.

JENA (2009). *Jena Web Site*, available at http://jena.sourceforge.net/, accessed May 2009.

Karvounarakis G., Magkanaraki A., Alexaki S., Christophides V., Plexousakis D., Scholl M., Tolle K. (2004). RQL: A Functional Query Language for RDF, In *The Functional Approach to Data Management: Modelling, Analyzing and Integrating Heterogeneous Data*, P.M.D.Gray, L.Kerschberg, P.J.H.King, A.Poulovassilis (eds.), LNCS Series, Springer-Verlag, 435-465.

Kashyap V., Bussler C. & Moran, M. (2008). *The Semantic Web: Semantics for Data and Services on the Web*, Springer-Verlag, ISBN 978-3-540-76451-9, Berlin.

Kotzinos D., Flouris G., Tzitzikas Y., Andreou D. & Christophides V. (2008). Supporting Evolution of Knowledge Artifacts in Web Based Learning Environments In: *Solutions and Innovations in Web-Based Technologies for Augmented Learning: Improved Platforms, Tools, and Applications*, Nikos Karacapilidis (editor), Information Science Reference, ISBN: 978-1-60566-238-1, USA.

Kungas P. & Matskin M. (2007). From web services annotation and composition to web services domain analysis, *International Journal of Metadata, Semantics and Ontologies*, Vol. 2, No.3 , pp. 157 - 178, 2007.

Lusch R. F, Vargo S. L. & M. O'Brien (2007). Competing through service: Insights from service-dominant logic, *Journal of Retailing*, Vol. 83, No 1, 5–18.

Lusch R. F, Vargo S. L. & Wessels G. (2008). Toward a conceptual foundation for service science: Contributions from service-dominant logic, *IBM Systems Journal*, Vol. 47, No. 1, 5-14.

Lusch R. F. & Vargo S. L. (2006). Service-Dominant Logic: Reactions, Reflections and Refinements, *Marketing Theory*, Vol. 6, No. 3, 281–288.

Maglio, P. & Spohrer, J. (2008). Fundamentals of service science, *Journal of the Academic Marketing Science*, Vol. 36, 18-20.

Moore J.F. (1996). *The Death of Competition: Leadership and Strategy in the Age of Business Ecosystems*, J. Wiley & Sons, Winchester, England, 1996.

Musser, J. (2006). *O'Reily Radar: Web 2.0 Principles and Best Practices*. O'Reilly Media Inc.

Normann R. & Ramirez R. (1993). From value chain to value constellation: designing interactive strategy, *Harvard Business Review*, Vol. 71, No. 4, 65 – 77.

OASIS (2004). *UDDI Spec Technical Committee Draft, Version 3.0.2*, available at http://uddi.org/pubs/uddi_v3.htm, published October 2004.

OASIS (2006). *Reference Model for Service Oriented Architecture 1.0*, http://www.oasis-open.org/committees/ tc_home.php?wg_abbrev=soa-rm, accessed August 2006.

OASIS (2007). *Web Services Business Process Execution Language Version 2.0*, available at http://docs.oasis-open.org/wsbpel/2.0/OS/wsbpel-v2.0-OS.html, published April 2007.

Peppers D., Rogers M. & Dorf B. (1999). Is your company ready for one-to-one marketing? *Harvard Business Review*, Vol. 77, No. 1, 151-160.

Porter M (2001). Strategy and the Internet, *Harvard Business Review*, Vol. 79, No. 3, 63–78.

Prahalad C. K. & Ramaswamy V. (2004). *The Future of Competition: Co-Creating Unique Value with Customers*, Harvard Business School Press, ISBN 978-1578519538, New York.

Prahalad C.K & Ramaswamy V. (2000), Co-opting customer competence, *Harvard Business Review*, Vol. 78, No. 1, 79 – 87.

Prahalad C.K and Ramaswamy V. (2003). The new frontier of experience innovation, *Sloan Management Review*, Vol. 44, No.4, 2003, 12 – 18.

Roman D., Keller U., Lausen H., de Bruijn J., Lara R., Stollberg M., Polleres A., Feier C., Bussler C., & Fensel D. (2005). Web Service Modeling Ontology, *Applied Ontology*, Vol. 1, No. 1, 77 - 106.

Rust R.T. & Kannan P. K. (2003). E-Service: A New Paradigm for Business in the Electronic Environment, *Communications of the ACM*, Vol. 46, No. 6, 37-42.

Rust R.T. & Lemon K.N. (2001). E-Service and the Consumer, *International Journal of Electronic Commerce*, Vol. 5. No. 3, 85-101.

Sawhney M. & Parikh D. (2001). Where value lives in a networked world, *Harvard Business Review*, Vol. 79, No. 1, 79 – 90.

Sawhney M. Balasubramanian S. & Krishnan V.V. (2003). Creating growth with services, *Sloan Management Review*, Vol. 45, No. 2, 34– 44.

Seth A., Ramakrishnan C. et al. (2005). Semantics for the Semantic Web: The Implicit, the Formal and the Powerful. *International Journal of Semantic Web and Web Information Systems,* Vol 1, No 1, 1–18.

Spohrer, J., Vargo, S. L., Caswell, N., & Maglio, P. P. (2008). The service system is the basic abstraction of service science. *Proceedings of the 41st Annual Hawaii International Conference on System Sciences (HICSS 2008)*, Hawaii.

Vargo S.L. & Lusch R. F., (2004). Evolving to a New Dominant Logic for Marketing, *Journal of Marketing*, Vol. 68, No. 1, 1–17.

Von Hippel E. (2006). *Democratizing Innovation*, The MIT Press, ISBN 978-0262720472, USA.

W3C (2008). *SPARQL Query Language for RDF*, available at http://www.w3.org/TR/rdf-sparql-query/, published January 2008.

W3C (2009). *Web Services Description Language (WSDL) 1.1*, available at http://www.w3.org/TR/wsdl, accessed May 2009.

Walters D. & Lancaster G. (1999). Value and information: concepts and issues for management, *Management Decision*, Vol. 37, No. 8, 643– 656.

Zuboff S. & Maxmin J. (2004). *The Support Economy: Why Corporations are Failing Individuals and The Next Episode of Capitalism*, The Penguin Group, ISBN 978-0142003886, New York.
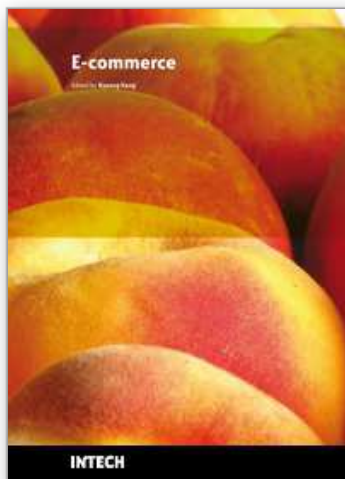
E-commerce

Edited by Kyeong Kang

E-commerce provides immense capability for connectivity through buying and selling activities all over the world. During the last two decades new concepts of business have evolved due to popularity of the Internet, providing new business opportunities for commercial organisations and they are being further influenced by user activities of newer applications of the Internet. Business transactions are made possible through a combination of secure data processing, networking technologies and interactivity functions. Business models are also subjected to continuous external forces of technological evolution, innovative solutions derived through competition, creation of legal boundaries through legislation and social change. The main purpose of this book is to provide the reader with a familiarity of the web based e- commerce environment and position them to deal confidently with a competitive global business environment. The book contains a numbers of case studies providing the reader with different perspectives in interface design, technology usage, quality measurement and performance aspects of developing web-based e-commerce.

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