

Business Model Design Methodology for Digital Services

Elena TAVLAKI¹, Euripides LOUKIS²

¹*University of Aegean, Department of Information & Communication Systems Engineering, Karlovasi, Samos, 83200, Greece*

Tel: +30210 6111244, Fax: +30210 6146450, Email: etavlaki@aegean.gr

²*University of Aegean, Department of Information & Communication Systems Engineering, Karlovasi, Samos, 83200, Greece*

Tel: +302273082221, Fax: + 30210 9813359, Email: eloukis@aegean.gr

Abstract: The contemporary network economy is built on powerful fixed and mobile network infrastructures. These infrastructures provide the solid ground for the continuous introduction of innovative both telecommunication services and business application services. Nevertheless, the exploitation and the profitability of these network infrastructures depend heavily on the commercial success of the services running on them. A critical precondition for the success of these services is to be based on sound business models, as business model is one of the most common factors encountered for, when Internet firms succeed in business. Especially today, in the networked economy, the concept of business model is not a theoretical tool but a prerequisite for success. Furthermore, the rapid introduction of innovative applications necessitates the rational design of their business model. However, despite the extensive use, and sometimes misuse, of the business model concept and design methodology, there exist very limited attempts in design methodology in scientific research. In the present paper, we propose a new framework for 'digital' business model design.

Keywords: business model, digital services, network applications, design methodology.

1 Introduction

The contemporary network economy is built on powerful fixed and mobile network infrastructures. These infrastructures provide the solid ground for the continuous introduction of innovative both telecommunication services and business application services. Nevertheless, the exploitation and the profitability of these network infrastructures depend heavily on the commercial success of the services running on them. The innovative services and applications changed the ecosystem of the economy and created new market space. A critical precondition for the success of these services is to be based on sound business models, as business model is one of the most common factors encountered for, when Internet firms succeed in business; for example, eBay, Amazon, Dell are examples, that much of their success is based on their innovative and successful business models. A survey-study (Linder et al., 2001), conducted by the Institute of Strategic Change of Accenture in 2000, concludes that "developing a sound business model matters for making money. A study of 453 successful websites (Chen, 2002), which were considered as the best by the leading magazines, concludes that their good business models were the most critical factors of their success. As the business environment changes business models wear out and firms must alter them in order to remain viable. The better the managers know their business model, the better they can manage patterns of change." It is evident that business model is a concept so fundamental to business performance that clarity is compulsory and no misunderstanding is tolerable. A good business model remains

essential to every successful organization, product or service; it incorporates the underlying economic logic that explains how value is delivered to customers at an appropriate cost (Magretta, 2002) and how revenues are generated. Furthermore, when a business model changes the economics of an industry and is difficult to replicate, it can by itself create a strong competitive advantage. On the contrary, many failures of e-ventures are the result of the lack of a sound business model or a flawed business model (Vickers, 2000).

However, the research of business model, design is not conducted in a systematic way. Despite the significance of the business model concept, only limited research has been conducted in this area. It consists mainly of descriptions of emerging business models, which are based on the Internet and the information and communication technologies (ICT) in general; also it includes abstractions in order to clarify definitions and components of this concept, and produce business model classification schemes. In the present paper, initially in section 2 we present a review of the definitions and the theoretical foundations of the business model concept and we elaborate on its discrete components. Then, in section 3 we propose a new framework for business model design. Finally, the conclusions are presented.

2 Theoretical background

The business model concept unifies important enterprise decision variables from the areas of economics, operations and strategy. It constitutes a useful unifying unit of analysis that can facilitate theory development concerning entrepreneurship. However, although the roots of business model theory are discernible in the above areas, the same does not hold for the definition of a “business model”, as there exist many diverse definitions of the term. At the most fundamental level the business model is limited to the economic model, namely how revenues and profits are generated. Business model is a statement of how a firm will make money and sustain its profit stream over time” (Stewart and Zao, 2000). Other approaches include value proposition and value generation architecture as well. The business model is the organization’s core logic for creating value. (Linder and Cantrell, 2000)”. “Business model describes the logic of a business system for creating value that lies behind the actual processes, according to Petrovic (Petrovic at al, 2001). In 2002, Magretta (Magretta, 2002) defines business models as stories-stories that explain how the enterprises work; business models describe, as a system, how the pieces of a business fit together, but they don’t factor in one critical dimension of performance: competition. She argues that business model is not the same as a strategy, even though many people use the term interchangeably today.

Another approach common in existing literature is the definition of the business model concept by specifying its primary elements and their interrelations. A characteristic well-known definition is that a (Timmers, 1998) business model stands for the architecture for the product, service and information flows, including a description of the various business actors and their roles, the potential benefits for these actors and the sources of revenues. According to Timmers’s definition the business model includes competition and stakeholders. In the same line, other researchers (Weill and Vitale, 2001) define a business model as a description of the roles and relationships among a firm’s consumers, customers, allies and suppliers that identifies major flows of product, information and money

and the major benefits to participants. Furthermore, business innovation models, named business webs (b-webs) are inventing new value propositions, transforming the rules of competition and mobilizing people and resources to unprecedented levels of performance..... A b-web is a distinct system of suppliers, distributors, commerce services providers, and customers that they use the Internet for their primary business communications and transactions (Tapscott et al, 2000) ”.

However, all these diverse definitions converge towards the approach that the business model is related to a number of managerial concepts; it captures key components of a business plan, but a business plan deals with a number of additional start-up and operational issues that transcend the model; it is not a strategy but includes a number of strategy elements; similarly, it is not an activity set, although activity sets support each element of a model. In conclusion, a business model can be defined as a blueprint, or a story, of how an interrelated set of enterprise variables, in the areas of strategy, operations architecture and economics are addressed and fit as a working system. In this sense business model represents the framework for conceptualizing a value-based innovative idea.

The main theoretical foundations of the business model concept come from the area of business strategy, being associated with the value chain concept (Porter, 1985), the extended notions of value systems, strategic positioning (Porter, 1996) and resource-based theory (Barney et al., 2001). Moreover, as the business model concept also incorporates the fit of the firm within a wider value creation network, its theoretical foundations come also from the areas of strategic network theory (Jarillo, 1995), cooperative strategies (Dyer et al., 1998) and transaction cost economics (Williamson, 1981).

The latest literature emphasizes the importance of defining the components of a business model. A pioneer in business model, Horowitz (Horowitz, 1996) argues that the main components of a business model are price, product, distribution, organizational characteristics and technology. According to Staehler (Staehler, 2001), a business model consists of three major components: the value proposition, the value architecture and the revenue model. Alt and Zimmerman (Alt et al., 2001) increase the number of components to six: Mission, Structure, Processes, Revenues, Technology, Legal Issues. Afuah and Tucci (Afuah et al., 2001) adopt a wider approach of business model by defining eight components of a business model, namely: Customer, Value, Scope, Pricing, Revenue Source, Connected Activities, Implementation, Capabilities, Sustainability. An interesting argument (Chesbrough et al, 2000) is that the business model mediates between the technical and economic domains and specify business model components through their definition of the six principal functions that a business model has to address:

- Articulate the value proposition, that is, the value created for users by the offering based on the technology;
- Identify the market segment, that is, the users to whom the technology is useful and for what purpose;
- Define the structure of the value chain within the firm required to create and distribute the offering
- Estimate the cost structure and profit potential of producing the offering, given the value proposition and value chain structure chosen;

- Describe the position of a firm within the value network linking suppliers and customers, including identification of potential complementors and competitors;
- Formulate the competitive strategy by which the innovating firm will gain and hold advantage over rivals.

Taking into account the various approaches concerning the definition and components of business model that exist in the current literature we finally selected to use in this paper and in our relevant research the following basic business model components, as they are generic, include all others and are the most critical factors taken into consideration for the success of the Business Model:

- The value proposition to the customer
- The sources of revenues and the cost structure
- The value production architecture (value chain and actors)

The above components selection is interrelated with the business model definition mentioned in this section.

3 Design Methodology

In this direction, in order to support innovative design of business models, we have developed a new generic framework for the design of ‘digital’ business models, without having to be based on existing previous ones. Its objective is to design the value proposition, the production architecture (value chain), the actors and the economic model of the business model. Our design framework consists of five stages, as shown in figure 1. Typically, several iterations of these five stages will be required; each iteration provides a better understanding and a more detailed design. Also, the understanding achieved in one stage might necessitate returning and repeating a previous stage(s). One should always consider that, most business models are not static and mainly should not be static. The technology on which they rely and the environment in which they operate are subjective to changes.

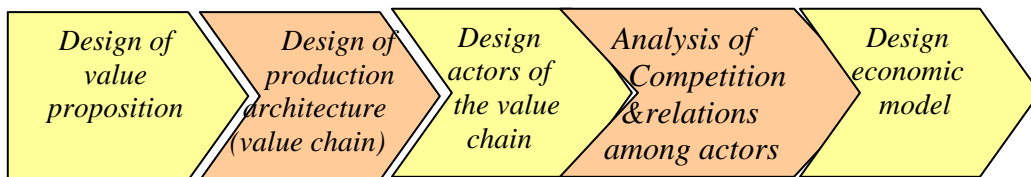


Figure 1: Generic framework for business model design

The five stages of our methodology are described in the following paragraphs:

1. Design of the value proposition

In this stage the value proposition is designed; the basic elements of the product/service that will be offered to each customer segment addressed are defined, based on the “Buyer Utility Map” framework (Table 1), (Chan Kim et al.,2000) and the “Value Chain Model” (Walters et al, 2000).

	<i>Purchase</i>	<i>Delivery</i>	<i>Use</i>	<i>Supplements</i>	<i>Maintenance</i>	<i>Disposal</i>
<i>Customer productivity</i>						
<i>Simplicity</i>						
<i>Convenience</i>						

<i>Risk</i>							
<i>Fun and image(aesthetics)</i>							
<i>Environmental friendliness</i>							

Table 1: Buyer Utility Map

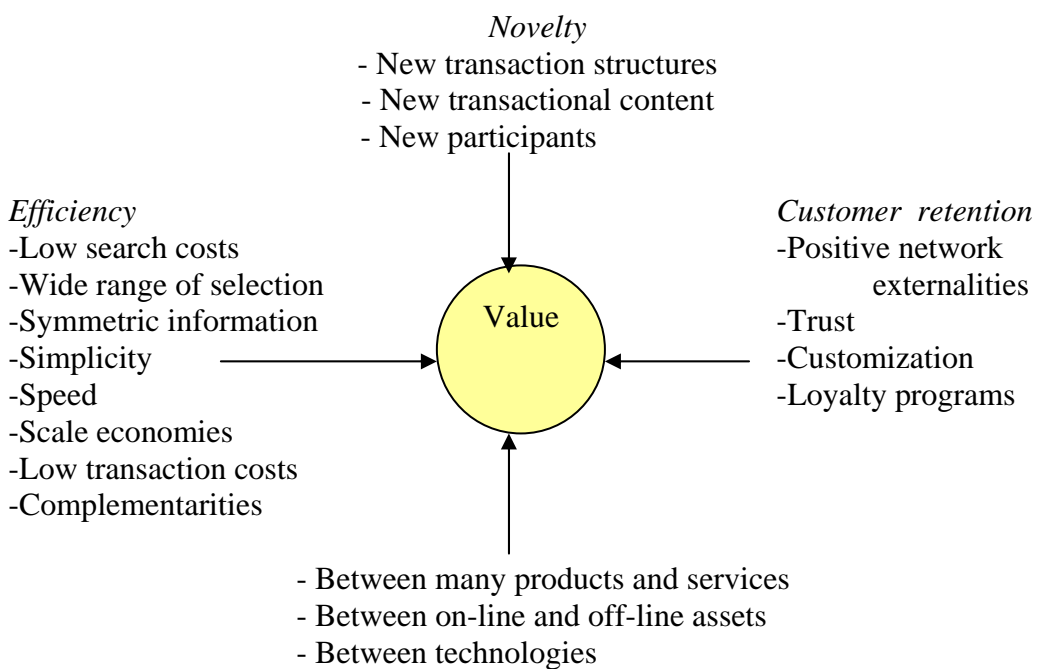
The Buyer Utility Map is used as an integral part of the definition of Value proposition, trying to fill in as many cells as possible in order the value proposition to be concrete and complete. For each of these cells, an analysis is conducted to find out if the value proposition is in compliance with the customer value criteria, specifically according to Walters; security, performance, aesthetics, convenience, economy and reputation.

In order to make this “Buyer Utility Map” more appropriate for designing electronic services, we enhanced it by adding to the above ‘buyer experience cycle’ three additional phases: the phase of ‘search’ (in the beginning of the cycle before the ‘purchase’) taking under consideration the symmetry of information (one of the Internet properties) (A. Afuah & C. Tucci, 2003), followed by the phase of trialability and the phase of customization (between the ‘delivery’ and the ‘use’), since according to the relevant literature (e.g. Amit & Zott, 2001) the most important sources of the value created by electronic channels are the high level of search and customization capabilities they offer. A very significant parameter for the adoption of an innovative service (among others) is the trialability. Trialability is the degree to which an innovation may be experimented with on a limited basis. According to the literature, trialability is a perceived attribute of an innovation and an important factor for its diffusion. (E. Rogers, 2003). Along this line of thinking, the simplicity versus complexity of the innovative service is an important factor of innovation diffusion. Another addition to the Buyer Utility Map is “Observability”. Observability is the degree to which the results of an innovative service are visible to the others. Some ideas are easily observed and communicated to other people, whereas other innovations are difficult to observe of describe to others.

	<i>Search (symmetric info)</i>	<i>Trialability</i>	<i>Purchase</i>	<i>Delivery</i>	<i>Customization</i>	<i>Use</i>	<i>Supplements</i>	<i>Maintenance</i>	<i>Disposal</i>
<i>Observability</i>									
<i>Customer Productivity</i>									
<i>Simplicity</i>									
<i>Convenience</i>									
<i>Risk</i>									
<i>Fun and image (aesthetics)</i>									
<i>Environmental</i>									

Table 2: Enhanced Buyer Utility Map

We can use this “Enhanced Buyer Utility Map” for designing the elements/capabilities of the new electronic service and also for analyzing similarly other competitive services (electronic or ‘physical’) and comparing them with the new service; this comparison may give very useful indications for enriching the map of the new service with additional elements/capabilities. In this way an initial list of the elements/capabilities of the new service can be developed. However, in order to exploit to the highest possible extent the capabilities offered by the specific electronic channel for which we design the new service (e.g. Internet or any other fixed or mobile network infrastructure), we can use additionally a ‘Value Model’ of this channel, which incorporates the main sources of value the specific channel can create. For designing Internet-based electronic services we are using the model of the sources of value creation in e-business developed by Amit & Zott (2001). It has been based on an extensive theoretical background concerning virtual markets, value chain analysis, Schumpeterian innovation, resource-based view of the firm, strategic networks and transaction cost economics, and also on extensive case study (detailed study of 59 successful public e-business companies from USA and Europe). This model is shown in Figure 2; according to this model there are four basic sources of value creation in e-business: efficiency, novelty, complementarities and customer retention; each of them is also analyzed into a number of specific value drivers. For each of the value sources and drivers of such a value model we try to devise additional useful elements/capabilities of the new service based on this specific value source or drive, and enrich the above initial list of elements/capabilities. In this way new ideas can be generated for innovative elements/capabilities of the new service, by exploiting the extensive theoretical background and practical experience incorporated in such value models. Moreover, if we have some information concerning the value criteria of the targeted customer segments concerning similar services (electronic or ‘physical’), we can exploit them similarly for further enriching the above list of elements/capabilities of the new service.



- Between activities

Figure 2: Sources of value creation in e-business (Amit & Zott, 2001)

Each source of value creation in e-business model is incorporated in the various stages of the described methodology, e.g the customer retention activities are inherent part of the marketing activities of the value design architecture stage.

Concluding with the Enhanced Buyer Utility Map, we screen it by checking the relative advantage of the innovative service and its compatibility. Relative advantage is the degree to which an innovation is perceived as being better than an idea it supersedes. The degree of relative advantage is often expressed as economic profitability, as conveying social prestige, or in other ways, while Compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters. (E. Rogers, 2003). Concluding, it is advisable to use the Enhanced Buyer Utility Map in order to define the value proposition of a digital service, while the sources of value creation in e-business is most appropriate for the definition of a new technology or a bunch of services.

2. Design of production architecture

In this stage the production architecture (value chain) is designed, consisting of all the activities that have to be performed in order to deliver the value defined in the first stage. As producing a product or delivering a service requires completing a set of activities, it is at the activity level that much of the competitive advantage can be gained. In this stage, research is in progress concerning the design, of not only value chains but value creating networks as well. For this purpose we use the combination of physical, Porter’s “Value Chain Analysis”(Porter, 1996), and virtual value chain (Fitzsimmons et al., 1998) (Figure 3). For this purpose we use the the “Value Chain Model” of Walters and Lancaster (Walters et al, 2000) and the “Strategic Value Creation Networks Framework of Jarillo (Jarillo, 1995).

Support activities

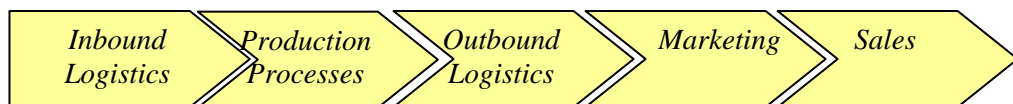
Infrastructure

Human Resource Management

Technology development

Procurement

Primary activities



Gather

Organise

Select

Synthesize

Distribute

Virtual Value Chain

Figure 3: Physical and virtual value chain

In order to be more precise, we can use the two additional ‘value creation configurations’ that have been proposed by Stabell & Fjeldstad (2001) for analysing complex specialized and mediation services: the ‘value shop’, which includes five primary activity categories: problem-finding, problem-solving, choice of alternative, execution, control & evaluation, and ‘value network’, which includes three primary activities categories: network promotion & contract management, service provision and infrastructure operation.

All value creation configurations; chain, shop and network, include the same set of support activities, as described in the classical Porter’s model.

The value shop, interrelates the five primary activities, as shown the diagram below.

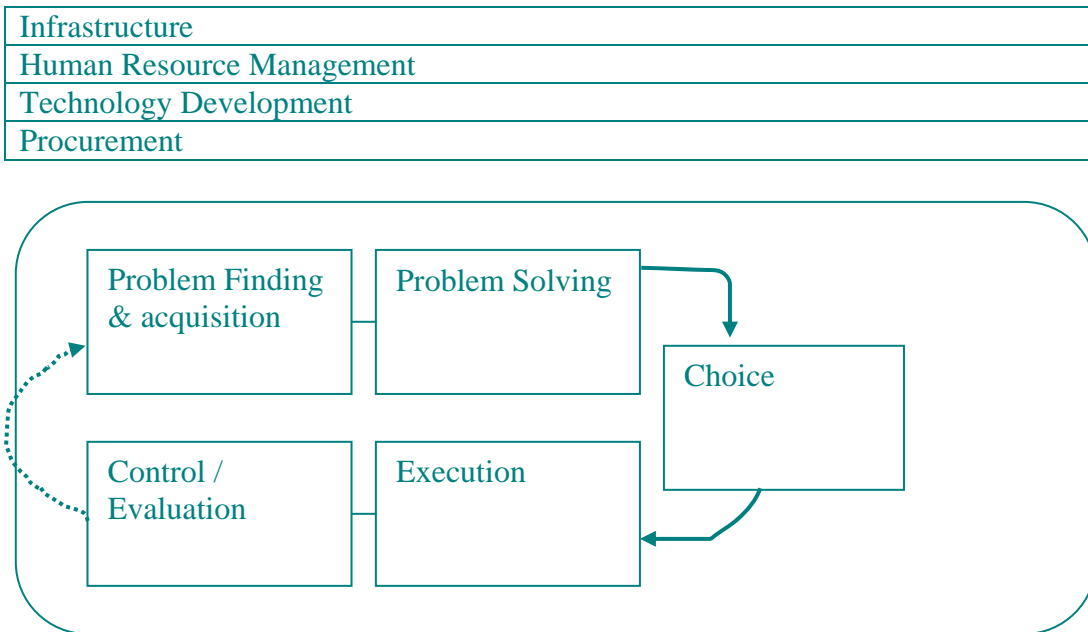


Figure 4: Value shop activities diagram

The value network interrelates the three primary activities, as shown in the diagram below. In the value network, a service/product exhibits network externalities when it becomes more valuable to users as more people take advantage of it.

Infrastructure
Human Resource Management
Technology Development
Procurement

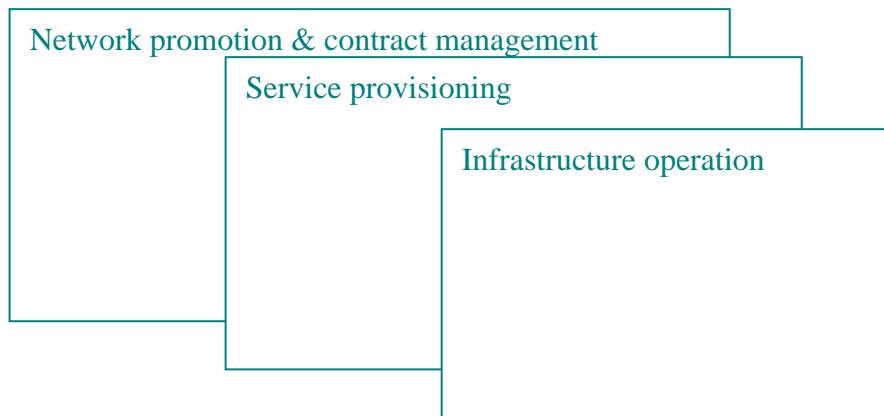


Figure 5: Value network activities diagram

Therefore, the design of the production architecture, reflects two step approach. The first step is the identification of the value creation logic of the innovative service/product, thus value chain, value shop or network, while the second step is the decomposition of the service into strategically important activities and understanding their impact on cost and value.

3. Design the actors of the value chain

For each of the value production activities defined in the second stage, the most suitable actors for executing it, are determined, based on the “Resource-Based Theory” (Barney, 1999; Barney et al, 2001) and the framework of Talluri (1999). In particular, for each activity are determined the resources and capabilities required for executing it efficiently and effectively, and its critical success factors; based on them initially are identified various alternative classes of actors.

It should be also considered in this stage, that Internet itself form an important actor of the value chain, shop or network. Specifically, Internet acts as a distribution channel for products/services that are largely information bits. There is a replacement effect if the Internet is used to serve the same customers served by the old distribution channel without bringing in new customers. On the other hand, there is an extension effect if new customers are served due to lower transaction costs or the universality of Internet.

4. Analysis of competition

In this stage, for each of the layers of the production -architecture designed in the second stage, an analysis of the competitive positioning of the potential players is performed (figure 6), based on Porter’s “Five Forces Framework” (Porter, 1996); from this analysis players with extremely high level of power might be identified, which could possibly necessitate the redesign of the value production architecture by returning to stage 2. We remark that in our methodology the widest value proposition is designed in stage 1, based on the capabilities offered by ICT and then the competition is analyzed not only for the final value proposition (service/product) but also for all players of the value production activities.

An important aspect that the analysis of competition should consider immensely, is whether the innovative service/product creates new market space by creating a new value curve. The key to discovering a new value curve lies in asking four basic questions (Kim et al., 1999):

1. What factors should be reduced well below the industry standard?
2. What factors should be eliminated that the industry has taken for granted?

3. What factors should be created that the industry has never offered?
4. What factors should be raised well beyond the industry standard?

By creating new market space, potential new actors could perform the activities of the value production architecture.

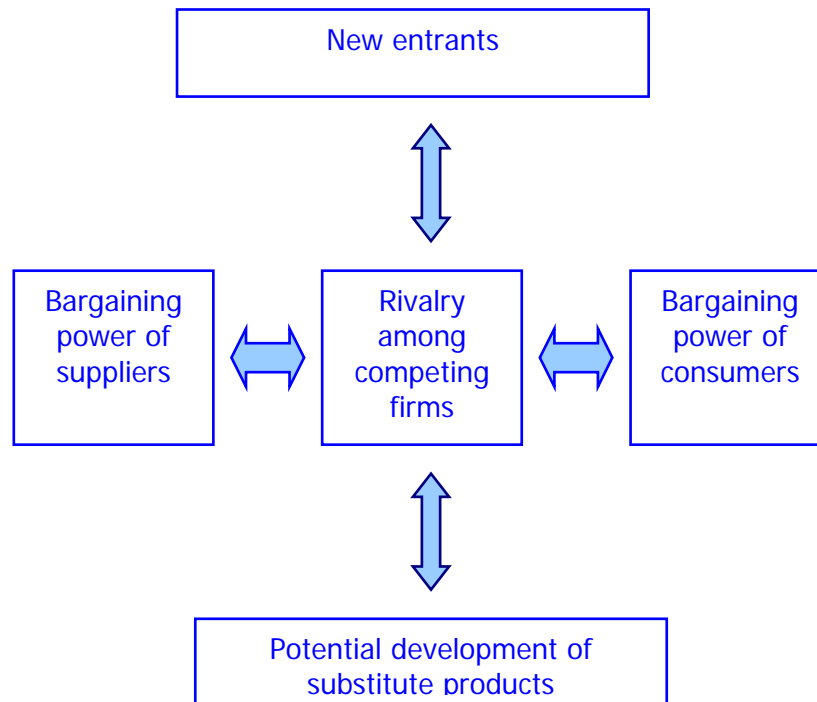


Figure 6: Porter's five forces

Finally, the relations among the value chain actors are designed by using the e^3 - value methodology and its extensions (Gordjin, 2002, Gordjin et al, 2003, Kartseva et al, 2004)). This model provides a more detailed approach for the contractual obligations, the value objects exchanged among actors, the control mechanisms and the possible violations.

The basic version of this methodology allows the formal representation of value creation through cooperation of several actors who exchange objects of economic value (e.g. products, services, money, etc.), based on a number of basic concepts, such as: actor, value object, value exchange, value interface, dependency path, etc. (see also Figure 4); in this way it supports the design and communication of the rights and obligations of each involved party. Its extension (e^3 - value+) allows also the formal representation of 'sub-ideal situations', in which one of the involved parties violates its obligations (i.e. does not deliver one or more of the value objects it was contractually obliged to deliver to another party), in this way supporting the design of clauses for possible violations of obligations.

5. Design economic model

In this stage, the economic model is designed, taking into account the "Price Corridor Model" (Chan Kim et al, 2000) and the different pricing models. In order to find the right price for the new product/service /application, it is necessary to identify the price corridor of the mass; the price bandwidth that captures the largest groups of customers. It is well-known that a bad pricing strategy cannot only leave money on the table, but also kill a product or service. A step further, the definition of the pricing model(s) for the specific service is of great importance; e.g Flat-rate, commission-based, advertising-based, mark-up based,

production-based, subscription-based, fee-for-service based models (Lumpkin et al., 2004) or direct selling, leasing, time-share, equity payment (Kim, 2000) etc. One simple but very enlightening relation, for considering the pricing strategy for digital services with high fixed costs and low variable costs, as innovative technological services usually are knowledge-based, is the following (A. Afuah et al., 2003):

$$\text{Profits} = (P - V_C)Q - F_C$$

Where P is the price per unit of the product or service

V_c is the per unit of the product or service variable cost

Q is the total number of units or services sold

F_c is the up-front or fixed costs

4 Conclusion

Business model is a concept fundamental to business performance, particularly for the numerous telecommunication and business application services of the new digital economy. For this reason, the concept of 'business model' has become quite popular, especially today, in the dawn of the new networked economy. However, despite the extensive use of the business model concept, only limited scientific research has been conducted in this area. In this paper we present a literature review on the definitions, the components and the theoretical foundations of business model. Then we propose a new framework for 'digital' business model design. So far, the new framework of the design methodology has been applied in several cases of innovative services providing a useful tool for researchers and managers.

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