

THE E-BUSINESS MODEL HANDBOOK

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Abstract

“Business model” is becoming the latest buzzword in the Internet and electronic commerce world. This research in progress has the ambition to give a more rigorous content to this term and its objective is threefold.

The first one is to propose a theoretical framework for defining, assessing, and building business models. The second objective corresponds to a field study for observing, analyzing, and cataloguing typical business models in a knowledge base. The final objective is to computerize this base and to specify a decision support system for helping business model creators to design, evaluate, and simulate new business models.

Keywords: business applications, critical success factors, measurement, benchmarking, model management systems, simulation and modeling IS, computer-aided analysis and design

1. INTRODUCTION

Nowadays new business models are constantly emerging in electronic commerce and can become a major stake in the e-business game (Bloch *et al.* 1996; Kalakota, 1999; Maître and Aladjidi, 1999). It is even possible to patent them in some countries (Pavento, 1999). Understanding the new business models and helping to design them are important research issues, not so well covered until now.

The first objective of this on-going research is to propose a *theoretical framework* for defining, classifying, assessing, measuring and modeling business models. The second issue aims at deploying an *empirical phase* for describing, cataloging, and analyzing case studies illustrating typical business models. The third goal is to develop a *computer-aided design tool* for supporting the design, the assessment, the benchmarking, the critics, and the simulation of new business models (see Figure 1 for a general overview of this research).

This project shares with the *Process Handbook* project of the MIT (Malone *et al.*, 1999) the key idea that a repository and the associated computerized tool can significantly enhance the creativity and the efficiency of *business model* designers (and not the *process model* designers in our case).

The next section proposes a definition of a business model covering the product innovation, the customer relationship, the infrastructure management and the financial aspects; it also deals with the categorization and the cataloguing of e-business models in a knowledge base or repository. Then, section 3 tackles the assessment of business models for emphasizing their critical success factors, their performance measures and their benchmarks. Finally, section 4 proposes to use a system dynamics approach for modeling and simulating business models, useful for scenario planning and strategy building under uncertainty.

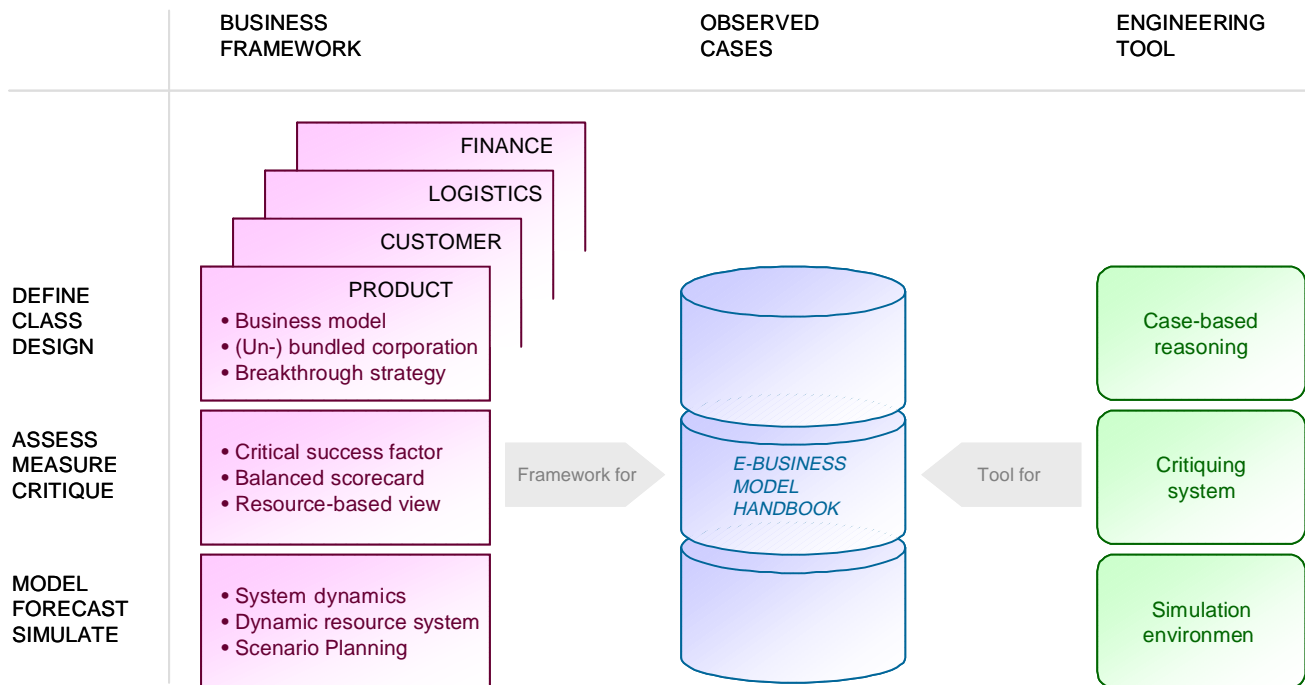


Figure 1: General overview of the research

2. DEFINING, CLASSIFYING AND DESIGNING BUSINESS MODELS

The term of “business model” in the so-called new economy (Maître and Aladjidi, 1999) has different meanings. However most agree that a business model represents a way of doing business under uncertainty. Therefore we suggest to adopt a definition, adapted from Hagel and Singer (1999), and Markides (1999), which emphasizes that a business model has to address the following issues:

- [Product innovation] What are the business, the product innovation and the value proposition offered on the market?
- [Customer relationship] Who are the customers targeted, how to deliver them the products, and how to build strong relationships with them
- [Infrastructure management] How will the infrastructure or logistics be efficiently performed, with whom, and which kind of virtual enterprise?

and finally,

- [Financial aspects] What are the revenue model (transaction, subscription/membership, advertising, commission, licensing) and the cost model (cost of goods sold, operating expenses for R&D, sales and marketing, general and administrative).

Another problem is to categorize the business models and to define a limited number of generic business models. Several classifications have been proposed in the literature. Most authors suggest two dimensions in order to classify the business models: functional integration and degree of innovation (Timmers, 1998), economic control (both hierarchical and self-organizing) and value integration (Tapscott *et al.*, (1999), type of relationships and degree of externality (Amami and Thévenot, 1999), power of sellers and buyers (Pigneur, 1999). Based on their classification, they propose to keep a limited number of basic types of business models: from 5 for Tapscott *et al.* (1999) to about 30 for Rappa (1999). This diversity shows the inadequacy of a unique classification scheme.

Therefore, unlike the hierarchical “decomposition and specialization” structure adopted by the *Process Handbook* (Malone *et al.*, 1999), we suggest to use a multiple-category approach and to consider the idea that a business model could be described with several dimensions, in a web of many classification schemes. The business models of *PriceLine* could be considered for example as an “Agora” in the classification of Tapscott *et al.* (1999), high (self-organizing) on the control axe, low on the value integration; as an “e-auction” in the classification of Timmers (1998), medium on the functional integration and medium (to high) on the degree of innovation; as a “Reverse auction e-market” in the classification of Pigneur (1999), balanced power between buyers and sellers.

As mentioned in the introduction, one of the main ideas of this research is to define such a theoretical framework for specifying a knowledge base and a computer-based tool that could support the design process of business models.

From an engineering tool point of view, the idea of a business model handbook or computer-aided design is similar to the case-based reasoning or *CBR* (Leake, 1996) where reasoning is based on recalling: new solutions, business models in this research, are generated by retrieving the most relevant cases in the memory and adapting them to fit new conditions. The knowledge of a business model designer is ever changing as new business models are emerging and are being stored in the knowledge base for future use. Leake (1996) writes that a case-based reasoner learns from previous experience in order to take advantage of prior successes and avoid known causes of failures. He also mentions that the case-based reasoning approach is well adapted when principles of a domain are not well understood; which is the case of e-business. Therefore, case study approach may be a better solution than the building of a theory or a set of rules, as cases reflect what really happens in a specific environment.

Research propositions

Based on the ideas developed in this section, the first set of hypotheses of this research is the following:

- [theory] It is useful to refine the framework suggested above (based on the Product, Customer, Infrastructure and Finance aspects) in order to define business models, by using many classification schemes,
- [observation] It is possible to use the previous framework for describing, categorizing and cataloguing in a knowledge base the business models of prominent case studies, and
- [tool] It is interesting to specify, search, and browse the business models of the knowledge base using a computer-aided design tool, using *CBR* approach (Leake, 1996), drawing out new solutions, from scratch or by (un-)bundling, taking over and customizing existing business models; assessing alternative designs in the decision-making process.

By now, the throughput of the project consists of a first version of the framework to be defined and a first exploration of well-known case studies (with quotation and public files). Some interviews are in progress for more original cases.

3. ASSESSING, MEASURING AND CRITICIZING BUSINESS MODELS

Designing a business model requires a measurement system which points out the variables and the key indicators allowing the estimation of the success of the business models.

To assess a business model and elicit the requirements of a measurement system, it is necessary to determine the Critical Success Factors (CSF), popularized by Rockart (1979). In our research, we are considering these factors according to the four components of the adopted framework: Product innovation, Customer relationship, Infrastructure management and Financial aspects.

A unified theory for understanding adding value strategy in a e-business context does not exist. However useful insights can be drawn from different theories such as market-power theory (Porter and Millar, 1985), transaction cost economics (Williamson, 1975), agency theory (Jensen and Meckling, 1976), game theory (Zagare, 1984), organizational learning (Senge, 1990) and, specially, the resource-based view (Conner and Prahalad, 1996). This theory expands the traditional competitive advantage approach by stressing that a competitive advantage results from efficiently deploying a set of rare and valuable resources. This theory could be more deeply investigated in order to extract the critical success factors for the different components of the framework: human talents for the Product innovation, brand name for Customer relationship, quality of partners for Infrastructure management, trust of the venture capitalists for Financial aspects, just for mentioning short examples.

For the measurement system, the idea of this project is to link each business model with measures based on the balanced scorecard approach. Kaplan and Norton (1996) introduced the idea that a measurement system has to reflect a balanced view of the organization's objectives in four areas, which precisely correspond with the four components of our framework:

- [Product innovation] indicators that assess the originality of the value proposition and identify what the organization has to build for learning, long term growth, and innovation (creativity, employee capabilities, motivation, turnover, stock options, ...). According to Hagel and Singer (1999), in e-business, measuring human talents and speed to the market seems key for this aspect of the framework,
- [Customer relationship] indicators that assess the relationships between the organization and its customers (retention, acquisition, satisfaction, profitability, ...) and the customer perception of the value proposition (functionality, quality, price, timeliness, brand image, availability, shopping experience, ...). According to Hagel and Singer (1999), assessing economy of scope and customer satisfaction seems key for the customer aspect of the framework,
- [Infrastructure management] indicators that identify the internal activities (of the value chain) and processes with the greatest impact on customer satisfaction and financial objectives. According to Hagel and Singer (1999), evaluating economies of scale and efficiency seems key from a logistics point of view,

and finally,

- [Financial aspects] measures that serve as the focus for the objectives and the measures of all the other perspectives. They concern revenue growth, cost management, asset utilization and market capitalization.

Finally, from a tool perspective, by using this measurement system, this research aims also to explore the interest and the feasibility of a more active tool in the computer-aided design environment: it would be a *critiquing system* (Fisher *et al.*, 1991), which could recognize and communicate to the designers key critics concerning a specific business model and, so doing, could enhance the designer ability to evaluate their solutions. Fisher *et al.* (1991) mention that critiquing systems are well suited for design tasks in complex domains (such as e-business!) with the following characteristics: (a) knowledge about design domain is incomplete and is evolving rapidly, (b) the problem requirements can be specified only partially, and (c) necessary design knowledge is distributed among many design participants.

In its simplest form, this critiquing system could be similar to an opportunity/threat method such as presented by Frick *et al.* (1999) or Bodart (2000) with their assessment questions to the business model designers during the design process.

Research propositions

Based on the ideas developed in this section, the second set of hypotheses of this research is the following:

- [theory] It is necessary to assess and measure a business model with specific critical success factors, balanced scorecard indicators and benchmarks, for the 4 aspects of the framework: product innovation, customer relationship, infrastructure management and financial aspects,
- [observation] It is useful to detect and make explicit critical success factors, key measures and benchmarks for the adopted illustrative case studies, and
- [tool] It is interesting to provide the business model designer with a computer-based *critiquing system* (Fisher *et al.*, 1991), which increases the designer's understanding of business models and their measures by pointing out breakdown situations early in the design process.

Until now, the achieved results consist of a first version of the critical success factors and balanced scorecard measures of the explored case studies.

4. MODELLING, FORECASTING AND SIMULATING BUSINESS MODELS

As the future in this area is so uncertain (Courtney *et al.*, 1997), a scenario-based forecasting approach could be helpful before defining a strategy of adoption, deployment, and management of a business model.

A scenario (Ringland, 1998; Clemons *et al.*, 1998) is a tool, focused on a decision issue, for ordering perceptions about a range of uncertain futures using a set of stories built around carefully designed studies. Scenario planning, popularized by *BP* in the 70's, follows a systematic, interactive, and imaginative process. The exercise finishes with a couple of scenarios presenting plausible and surprising alternative futures, instead of extrapolating current trends like traditional forecasting.

To prepare and analyze the scenarios, this project has the objective to adopt a *dynamic simulation* modeling approach (Sterman, 2000), with its causal loop diagrams, similar to the more recent *Dynamic Resource System View* (Warren, 1999), related to the already discussed *Resource-based view* theory (Conner, 1996).

Such a dynamic model creates a replica of a business model, under the form of equations, identifying resources or stocks and the ways they interrelate, via flows. The level of resources or stocks can grow or decline over time, depending on other resources in the model, and forecasting parameters. Such a model can be simulated and should help answering to the following questions, proposed by Warren (1999): Why has the historical performance of my business followed the time-path that it was? Where will the path of future performances take us if we carry on as we are? How can we alter that future for the better? Modeling and simulating a business model should improve the learning feedbacks (Senge, 1990).

The idea of this project is to build, for each business model, four *system dynamics* models, one for each component of the framework (Product innovation, Customer relationship, Infrastructure management, and Financial aspects), and then, to integrate them in a general model in order to reproduce their history and forecast their future. Normally, the design of the model would have been facilitated by the determination of the balanced scorecard measures, in the previous phase.

Research propositions

Based on the ideas developed in this section, the third set of hypotheses of this research is the following:

- [theory] It is useful to use a system dynamics approach for modeling the four components of a business model: product innovation, customer relationship, infrastructure management and financial aspects,
- [observation] It is interesting to model the influence diagrams and the equations of the adopted illustrative case studies, and

- [tool] It is adequate to provide the business model designer with a computer-based *simulation facility*, such as *iThink*, for simulating a business model over time, forecasting its results and trying it in different scenarios.

5. CONCLUSION

At the conference, we propose to present the design of a business model, in the food retail sector, covering the three different aspects shortly presented in this paper: the framework and its 4 components (product, customer, infrastructure and finance), the measurement system, and the system dynamics models. This case presentation should allow to demonstrate the theoretical, the observation and the tool perspectives of this promising research.

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