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THE BUSINESS MODEL ONTOLOGY
A PROPOSITION IN A DESIGN SCIENCE APPROACH

THESE

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To all those people out there fighting poverty in the world

1 INTRODUCTION

1.1 BACKGROUND AND RESEARCH CONTEXT

1.1.1 Economic Context

The ideas for this research on business models emerged when e-business, e-commerce and the so-called new economy where blooming and booming. At that time many people in business and academe used to believe that the Internet would make existing business rules or even economic theories and laws obsolete (e.g. Merrifield 2000; Wood 2000). One could often hear that traditional business models were dead and that new business models were emerging. The term became a buzzword and was used by managers, academics and journalists for everything and nothing related to the "new economy", an economy driven by ICTs. However, I started this research at the end of October 2000 when the so-called dotcom bubble just burst and technology stocks where in full decline (see Figure 1). This was a little bit disturbing because the expression business model, the core of my research, was largely associated to the "new economy" (e.g. Boulton and Libert 2000). Furthermore, many and particular the press decided in the year 2000 that the idea of business models was dead. Was I supposed to drop my research?

I decided to stick to the expression and to the research on business models and see what the future would bring, because my conceptual perception of business models has little to do with the press' and mainstream publics' perception of business models. Though the excessive dotcom hype negatively earmarked the expression I believed the concept of business models would reemerge as a helpful instrument in management. This proved to be the right decision, as the appearance of a decent research stream on business models in management and information systems has shown.

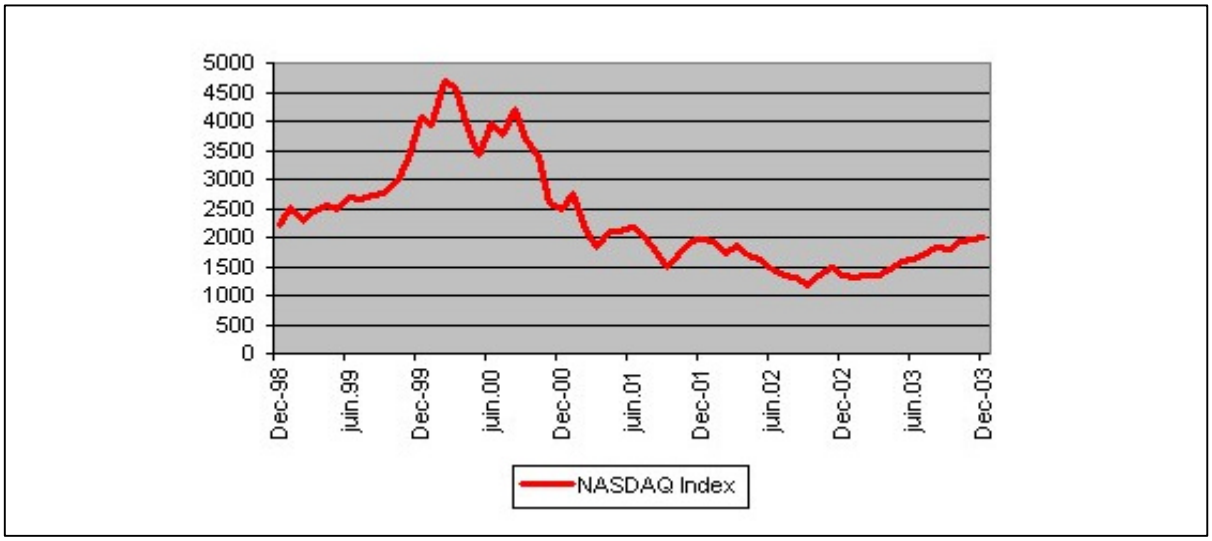

Figure 1: NASDAQ Chart 1998-2003

1.1.2 Academic Background and Context

After achieving a degree in political science and then business information systems of the University of Lausanne, Switzerland I decided to stay at my alma mater as a doctoral candidate. I started to work as a research assistant under Professor Yves Pigneur at the Information Systems Department, where I taught and conducted research on business models. In the course of time I also started to rediscover my interest in developing countries, which I had developed during my studies in political science. Thus, besides setting up an interfaculty seminar on Information Technology (ICT) and development, I tried to combine my core research with the subject of the seminar and the reader will notice that some of the examples in this dissertation are ICT-based business models from the "South". Furthermore, I was partially involved in a research project called MICS: Mobile Information and Communication Systems of the National Centers of Competence in Research (NCCR) and managed by the Swiss

National Science Foundation on behalf of the Federal Authorities. Hence, you will also find some illustrations and cases from the mobile industry in this thesis.

1.2 RELEVANCE AND RESEARCH GOALS

Although the dotcom bubble has burst it is clear that the Internet and other ICTs are here to stay and companies have to cope with them. Beyond the Internet hyperbole of the late 90s, few experts deny that the Internet, the WWW, e-commerce and e-business have had and will continue to have an enormous impact on businesses. This is best illustrated by the so-called Hype Cycle of Gartner (Linden and Fenn 2003), a technology research and advisory firm. Gartner's Hype Cycle, introduced as early as 1995, characterizes the typical progression of an emerging technology from over-enthusiasm through a period of disillusionment to an eventual understanding of the technology's relevance and role in a market. Today it is clear that ICTs and particularly the Internet have changed the business landscape and that they are relevant for conducting business. The impact has been huge, even if traditional business rules have not been abrogated, as some authors have suggested during the hype (e.g. Merrifield 2000).

In my opinion one of the major impacts of ICTs has been an increase in the possible business configurations a company can adopt because of the reduced coordination and transaction costs (see Coase 1937; Williamson 1975). In other words, they can increasingly work in partnerships, offer joint value propositions, build-up multi-channel and multi-owned distribution networks and profit from diversified and shared revenue streams. This, however, means that a company's business has more stakeholders, becomes more complex and is harder to understand and communicate (for more details see section 2.1). If this assumption is true one can argue that the existing management concepts and tools may not be sufficient enough anymore and that new ones have to be found. For example, Rentmeister and Klein (2003) call for new modeling methods in the domain of business models. Effectively, a whole range of authors propose using the relatively new concept of business models for managing companies in the Internet era (Chesbrough and Rosenbloom 2000; Afuah and Tucci 2001; Applegate 2001; Pateli and Giaglis 2003). This dissertation is part of this new research stream on business models and focuses on a specific area not so well covered until now: specifying and conceptualizing business models. Whereas most business model research stays at a non-conceptual, broad and sometimes even vague level, this work tries to dig into the details and define a generic model to describe business models. Such an approach is indispensable if one does not only want to provide rather simple management concepts, but effective software-based business model tools to improve managing in a rapidly moving, complex and uncertain business environment.

The research question of this dissertation is:

How can business models be described and represented in order to build the foundation for subsequent concepts and tools, possibly computer based?

To tackle this question I design and propose a rigorous conceptual model of business models, which I subsequently call an ontology. Gruber (1993) defines an ontology as an explicit specification of a conceptualization. It can be understood as a description (like a formal specification of a program) of the concepts and relationships in a specific domain. In the domain of IS ontologies were originally used in artificial intelligence and knowledge engineering. Now its importance is being recognized in research fields as diverse as knowledge representation, qualitative modelling, language engineering, database design, information modelling, information integration, object-oriented analysis, information retrieval and extraction, knowledge management and organization, and agent-based systems design. Current application areas of ontologies are also disparate, including enterprise integration, natural language translation, medicine, mechanical engineering, standardization of product knowledge, electronic commerce, geographic information systems, legal information systems[2], biological information systems (Guarino 1998).

What I call an ontology can also be understood as a reference model. Duce and Hopgood (1990) refer to a reference model as follows: "*The two words "reference" and 'model' establish the overall intent [..] A 'reference' is something which can be referred to as an authority. A 'model' is a standard or example for imitation or comparison. It provides a pattern on which to base an artifact.* Duce,

Giorgetti et al. (1998) see reference models as "*a basis for a new type of system which exhibits significant advantages over previous approaches; a basis for explaining deficiencies in existing systems and showing ways of overcoming these; as a framework within which systems may be compared and new systems designed*". Reference models exist in many different domains, for instance in supply chain management (SCC 2003), networking (ISO 2003) or visualization systems (Wood 1998). However, because the term ontology is gaining increasing weight and acceptance in the information systems and computer science community and besides other things stands for the definition of semantics and syntax in a domain I will subsequently refer to my modeling approach as a domain ontology. This seems to suit the business model ontology quite well, as it aims at defining the concepts and their relationships in the business model domain. Yet, it must be said that there are different degrees of rigor and formalness in an ontological approach. The business model ontology and its business model modeling language BM^2L can be understood as semi-formal in the sense of Ushold and Gruninger (1996) and are "*expressed in an artificial formally defined language*".

Based on the above, my research goal is to tackle the concept of business models with an ontological approach in order to provide the basis for new management tools. In the general terms of Ushold and King (1995) this means:

- Identification of the key concepts and relationships in the domain of interest (i.e. scoping the domain of business models)
- Production of precise unambiguous text definitions for such concepts and relationships
- Identification of terms to refer to such concepts and relationships
- Agreeing on all of the above

The outcome of this research is a generic business model ontology that shall ideally represent the foundation for new management tools in strategy and information systems, possibly software based. One simple prototype tool that shall be provided in this dissertation aims at facilitating the description of a business model.

Subsequent tools based on the business model concept (but not researched in this dissertation) are necessary for the following reasons:

- Today's business landscape is characterized by complexity and uncertainty, based among other things on the dominant influence of ICTs and the resulting large range of possible business models. Yet, the concepts and tools to cope with this are still missing
- Increasingly, today's business models demand the coordination of a large number of stakeholders, such as partners, strategists, business process designers and information systems staff. But so far few management tools exist to understand, map and share the business logic of today's firms.
- After an initial hype of over-funded, megalomaniac business models, rigorous business planning for profitability has become indispensable again considering today's fierce global competition. This means that all parts of a business have to be optimized and reinforcing and that details in a business model make the difference. Yet, few approaches and concepts exist that give an overall view of a business.

As I will explain in the next section on the dissertation's methodology (see section 1.3) the research goals can be summarized as the delivery of a business model ontology (see section 4), its validation (see section 17) and the demonstration of some possible applications (see section 6).

1.3 METHODOLOGY

Finding an adequate founding in methodology was not easy, given that the goals of this research do not necessarily follow mainstream management or IS research directions. Traditional research in these areas often focus on theory building and theory testing. At first glance, working on a generic business model framework might also seem like theory work. But if business model research is certainly theoretical it does not mean that it is a theoretical contribution to science as commonly understood. In

a special issue of the Academy of Management Review dedicated to theory, David A. Whetten (1989) nicely defines a framework of what constitutes a theoretical contribution. Central to his framework and to theory building is the notion of understanding the WHY of a phenomenon in question. Theory helps discerning how things come to be as they are and how they function. This is the case for theory building on natural as well as on social phenomena. Simply put, theory helps explaining patterns found in our world.

The nature of business model research, however, is quite different. The reasoning behind business model research is not the understanding of a phenomenon, rather it is a problem-solution finding approach. It is about finding the concepts and relationships that allow expressing the business logic of a firm in order to be able to formally seize this business logic. It means designing and building a model that makes it possible to represent the business model of a firm. The question that must immediately follow is, if this is valid and viable research or if it is mere consultancy work, meaning finding a solution to a problem. This question is significant because the research in this dissertation neither contributes to theory building as defined above nor to theory falsification and testing, which is the second major scientific preoccupation. So can a problem-solution finding approach as applied in this business model research qualify as a scientific method, specifically in IS? If we consider science in the light of Kuhn's scientific paradigms (Kuhn 1970) this depends on the scientific context of the moment. Paradigms are a collection of beliefs shared by scientists, a set of agreements about how problems are to be understood. Thus, the next step in finding out if business model research qualifies as scientific is looking for an accepted problem-solution finding method that can be applied to this dissertation. As a matter of fact, there exists a scientific research method applied to IS baptised design science (March and Smith 1995; Au 2001; Ball 2001) that can – with some modifications – be used in developing a business model framework. The essence of design science was nicely expressed by Buckminster Fuller (1992), an architect, engineer, mathematician, poet, cosmologist and forerunner of design science. *"The function of what I call design science is to solve problems by introducing into the environment new artifacts, the availability of which will induce their spontaneous employment by humans and thus, coincidentally, cause humans to abandon their previous problem-producing behaviours and devices. For example, when humans have a vital need to cross the roaring rapids of a river, as a design scientist I would design them a bridge, causing them, I am sure, to abandon spontaneously and forever the risking of their lives by trying to swim to the other shore".*

Translated to this dissertation, design science means designing a business model framework that helps managers and IS specialist express the business logic of a firm in a new way, abandoning the former informal business logic descriptions. This is in line with Nunamaker, Chen et al. (1990) who classify design science in IS as applied research that applies knowledge to solve practical problems.

1.3.1 Design Science

A good starting point to design science in IS is provided by March and Smith (1995). They define it as an attempt to create things that serve human purposes, as opposed to natural and social sciences, which try to understand reality (Au 2001). March and Smith outline a design science framework with two axes, namely research activities and research outputs (see Figure 2). Research outputs cover constructs, models, methods and instantiations. Research activities comprise building, evaluating, theorizing on and justifying artifacts.

RESEARCH ACTIVITIES

RESEARCH OUTPUT	Build	Evaluate	Theorize	Justify
Constructs				
Model				
Method				
Instantiation				

Figure 2: Design Science Research Framework (March and Smith 1995)

Constructs or concepts form the vocabulary of a domain. They constitute a conceptualization used to describe problems within a domain. A *model* is a set of propositions or statements expressing relationships among constructs. In design activities, models represent situations as problem and solution statements. A *method* is a set of steps (an algorithm or guideline) used to perform a task. Methods are based on a set of underlying constructs (language) and a representation (model) of the solution space. An *instantiation* is the realization of an artifact in its environment. Instantiations operationalize constructs, models and methods.

Concerning research activities, March and Smith (1995) identify *build* and *evaluate* as the two main issues in design science. Build refers to the construction of constructs, models, methods and artifacts demonstrating that they can be constructed. Evaluate refers to the development of criteria and the assessment of the output's performance against those criteria. Parallel to these two research activities in design science March and Smith add the natural and social science couple, which are theorize and justify. This refers to the construction of theories that explain how or why something happens. In the case of IT and IS research this is often an explanation of how or why an artifact works within its environment. Justify refers to theory proving and requires the gathering of scientific evidence that supports or refutes the theory (March and Smith 1995).

Summarized, constructs, models, methods and artifacts are *built* to perform a specific task. These outputs then become the object of study, which must be evaluated scientifically. They have to be *evaluated* in order to conclude if any progress has been made. In order to do this, we have to develop metrics and measure the outputs according to those metrics. For instance, when an artifact has been applied in a specific environment, it is important to determine why and how the artifact worked or did not work. Such research applies natural science methods to artifacts (*theorize*). Then, given a generalization or theory we must *justify* that explanation. Evidence has to be gathered to test the theory in question. Justification for artefacts generally follows the natural science methodologies governing data collection and analysis.

1.3.2 Research Outline of the Dissertation

The business model research in this dissertation is based on the design science framework detailed above and essentially covers the *build* and some *evaluate* research activities and has a research output of *constructs*, *models* and *instantiations*. As stated earlier (see section 1.2), the first research goal of this dissertation is to find an ontology (i.e. artifact or model) that makes it possible to conceptually express the business logic of a firm in a structured form. The second research goal consists in applying this model to one of its possible uses (i.e. instantiation), from which we chose two. Firstly, the instantiation of the ontology in an IT tool that allows to capture business models in a structured way

and secondly, IS & strategy alignment. In terms of March and Smith's research frameworks this means we will aim at finding the basic constructs of a business model and build and ontology that expresses the relationships among them. Subsequently, we have to evaluate the constructs and the model based on an adequate measurement system. The same two steps of building and evaluating apply to the two instantiations that are based on the ontology (IS & strategy alignment and IT prototype).

As illustrated in Figure 2, March and Smith (1995) propose a four by four framework that produces sixteen cells describing viable research efforts. The different cells have different objectives with different appropriate research methods. A research project can cover multiple cells, but does not necessarily have to cover them all.

Concerning the importance of a specific design science research its relevance and contribution in the build activity are judged on the basis of novelty of the artifact and its persuasiveness of achieving the goals it claims. Research in the evaluate activity is based on the development of metrics that allow to compare the performance of constructs, models, methods and instantiations for specific tasks. Evaluation of constructs tend to involve completeness, simplicity, elegance, understandability and ease of use.

In Figure 3 we illustrate which cells at the intersection of research activities and research outputs of March and Smith's framework (1995) are covered by this thesis. Each cell/intersection contains a specific research objective of the overall business model research and is addressed and explained in a specific chapter of the dissertation. The *build* column covers the quest for the basic concepts in business models (construct), the definition of a business model ontology (model) and the prototyping of an IT tool that assesses business models, as well as a proposition for IS and strategy alignment (instantiation). The *evaluate* column includes evaluating the completeness of the concepts (construct), the appropriateness of the ontology (model) and the application of the prototype and the IS and strategy alignment proposition to a specific case (instantiation). The *theorize* and *justify* columns and the according cells are not covered in this research, nevertheless they are addressed in the evaluation and conclusion (see sections 7, 9).

RESEARCH ACTIVITIES

RESEARCH OUTPUT

	Build	**Evaluate**	**Theorize**	**Justify**
Constructs	Find basic concepts for business models (i.e. building blocks) (sections 4)	Investigate completeness and understandability (section 4, 17)		
Model	Define an ontology that expresses the business logic of a firm. (section 4)	Investigate fidelity with real world phenomena (sections 7)		
Method				
Instantiation	IT Prototype to capture business models (e.g. XML) IS & Strategy alignment (section 6, 8.1)	Apply Prototype to cases Apply alignment proposition to case (section 5)		

Figure 3: Research outline based on March and Smith (1995)

1.3.3 Method Mix Applied to the Cells of the Design Science Framework

In the previous section we explained the research objectives in the different cells of March and Smith's framework (1995) covered by this dissertation. But as March and Smith explain, every cell and research objective may call for a different methodology. This makes it necessary to identify an adequate method for each specific research objective, resulting in an overall method mix. To achieve this I analyzed a study on the methodologies applied in and accepted by seven leading MIS journals during a recent five year period (Palvia, Mao et al. 2003). The study outlines thirteen different methodologies that they also rank by their popularity. From the thirteen I retain seven that fit well with the research objectives (respectively cells) I have defined previously. These methods are speculation/commentary, frameworks & conceptual models, library research, literature analysis, case study, interview and secondary data (see Table 1).

Methodology	**Definition**
Speculation/commentary	Research that derives from thinly supported arguments or opinions with little or no empirical evidence.
Frameworks and Conceptual Models	Research that intends to develop a framework or a conceptual model.
Library Research	Research that is based mainly on the review of existing literature.
Literature Analysis	Research that critiques, analyzes, and extends existing literature and attempts to build new groundwork, e.g., it includes meta analysis.
Case Study	Study of a single phenomenon (e.g., an application, a technology, a decision) in an organization over a logical time frame.
Interview	Research in which information is obtained by asking respondents questions directly. The questions may be loosely defined, and the responses may be open-ended.
Secondary Data	A study that utilizes existing organizational and business data, e.g., financial and accounting reports, archival data, published statistics, etc.

Table 1: MIS Methodologies retained for this research (based on Palvia et al. (2003))

Figure 4 illustrates which one of the retained methodologies I have applied to which cell and accordingly to which research objective. In the following lines I explain why I have chosen these methodologies and how they contribute to this research on business models.

The category *speculation/commentary* refers to articles and research that are not really based on any hard evidence. They largely reflect the knowledge and experience of the authors. By definition, they tend to be somewhat visionary in nature. Typically, they signal the arrival of new trends and directions in the technology, its management or application (Palvia, Mao et al. 2003). In this dissertation *speculation/commentary* has triggered the initial research on business models as a method for formally representing the business logic of a firm. It is somewhat visionary wanting to formalize business models in order to improve business and IS management and results will only occur after building and evaluating a model. Thus I use *speculation/commentary* as one of the contributors to build constructs and models.

Library research (which is also part of most of the other methodologies) summarizes and synthesizes past research, and highlights some of the important conclusions. *Literature analysis* goes a step further and examines many (perhaps all) past studies in a particular area and conducts a scientific meta analysis of the cumulative knowledge, in effect treating each study as one data point (Palvia, Mao et al. 2003). These two methodologies embody the basis for the design of the business model ontology. In order to build the ontology we rely on an extensive library and literature research on business model, managerial and to some extent ontology research.

Palvia et al. define *frameworks & conceptual models* as especially useful for a discipline that generally lacks and defies attempts to develop theory. They note that in lieu of theory, frameworks helped guide the work of many MIS researchers over the years. In this dissertation conceptual research in the form of the business model framework (i.e. business model ontology) is the heart of the research and follows March and Smith's (1995) design science principles of building and evaluating an artifact. In the case of this research the artifact takes the from of a conceptual model, a managerial application (IS and strategy alignment) and an IT prototype (an IT tool to seize business models).

Lee (1989) has been one of the first to argue that *case study research* in MIS can have as much rigor as quantitative research. A case study generally refers to the in depth study of a single phenomenon (e.g., one application, one technology) over time in a single organization (Palvia, Mao et al. 2003). In the case of this dissertation I use a case study that has a somewhat different function. It serves as a method to test and evaluate the validity of the constructs and the designed ontology, which is essentially based on interviews. Furthermore, the case study is applied to evaluate the instantiations of the ontology.

Although interviews are typically part of other methodologies, such as case studies and qualitative research, Palvia et al. (2003) list them as a separate category. The reason is that in their study they found this method repeatedly mentioned – either by itself or in combination with other methodologies – as the primary method of data collection. In this dissertation interviews are essentially used to evaluate the ontology by people that would use such a construct, like managers, consultants and academics.

IS research based on secondary data is not in widespread practice, as in other business disciplines (e.g., in Finance where company financial performance data and stock market data are analyzed frequently) (Palvia, Mao et al. 2003). However, this dissertation uses secondary data, drawing from company websites, financial databases and publicized case studies, in order to illustrate parts of the ontology or to evaluate some of its constructs.

RESEARCH ACTIVITIES

RESEARCH OUTPUT	Build	Evaluate	Theorize	Justify
Constructs	Speculation Library research Literature analysis Conceptual research	Case study Secondary data Interviews Literature analysis		
Model	Speculation Library research Literature analysis Conceptual research	Case studies Secondary data Interviews Literature analysis		
Method				
Instantiation	Conceptual research	Case study Secondary data		

Figure 4: Method Mix (based on March and Smith (1995) and Pavlia et al. (2003))

1.4 CONTRIBUTIONS OF THIS DISSERTATION

The goal of this dissertation is to bring business model research a step further. This is achieved by four different major and minor contributions:

1. Update of the knowledge in the business model domain provided by Stähler (2001), Gordijn (2002) and Pateli and Giaglis (2003) (i.e. revised literature review).
2. Consolidation of the research in the domain of business models into a specification of a conceptualization resulting in the proposition of a business model ontology defining the

semantics and relationships of nine main elements.

3. Demonstration that an ontology can be the fundament for software tools in the domain of business models by providing a prototype (BM^2L).
4. Outlook on what business models can be good for.
5. Proposition on business and IS alignment as ICT in general and e-business in particular are increaslingly underpinning today's business models.

The dissertation does NOT aim at the following:

- Modeling the whole enterprise. The dissertation focuses on the business model, i.e. the logic of how an enterprise earns money - it does not aim at describing the entire enterprise.
- Modeling and explaining business model success. The success of a business model relates not only to its design but to its implementation which is not part of this dissertation.
- Re-write strategy research. By providing a business model ontology that can help to describe how a company makes money this dissertation deals with a new concept that yet has to be integrated into strategy research as proposed by Rentmeister and Klein (2003).

1.5 STRUCTURE OF THIS THESIS

The dissertation is structured in nine parts:

Chapter 1 presents the motivations of this research, the research methodology with which the goals shall be achieved and why this dissertation present a contribution to research.

Chapter 2 investigates the origins, the term and the concept of business models. It defines what is meant by business models in this dissertation and how they are situated in the context of the firm. In addition this chapter outlines the possible uses of the business model concept.

Chapter 3 gives an overview of the research done in the field of business models and enterprise ontologies.

Chapter 4 introduces the major contribution of this dissertation: the business model ontology. In this part of the thesis the elements, attributes and relationships of the ontology are explained and described in detail.

Chapter 5 presents a case study of the Montreux Jazz Festival which's business model was captured by applying the structure and concepts of the ontology. In fact, it gives an impression of how a business model description based on the ontology looks like.

Chapter 6 shows an instantiation of the ontology into a prototype tool: the Business Model Modelling Language BM^2L. This is an XML-based description language that allows to capture and describe the business model of a firm and has a large potential for further applications.

Chapter 7 is about the evaluation of the business model ontology. The evaluation builds on literature review, a set of interviews with practitioners and case studies.

Chapter 8 gives an outlook on possible future research and applications of the business model ontology. The main areas of interest are alignment of business and information technology IT/information systems IS and business model comparison. Finally, chapter 9 presents some conclusions.

1.6 ACKNOWLEDGEMENTS

This is probably the nicest moment of my dissertation because I have the chance to thank all the people that have supported me and had to bear me during difficult moments. Though not essential to science this personal note is very important to me. I would like to name all, taking the risk of forgetting some and having to regroup others, but I am sure they will forgive me as they know that my heart is with them when my memory sometimes lets me down.

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2 ORIGIN, DEFINITION, PLACE AND ROLE OF BUSINESS MODELS IN THE FIRM

We live in a competitive, rapidly changing and increasingly uncertain economic environment that makes business decisions complex and difficult. Companies are confronted with new information and communication technologies, shorter product life cycles, global markets and tougher competition. In this hostile business environment firms should be able to manage multiple distribution channels, complicated supply chains, expensive IT implementations, strategic partnerships and still stay flexible enough to react to market changes. Astonishingly, the concepts and software tools that help managers facilitate strategic business decisions in this difficult environment are still scarce. Where are the tools that help managers easily explain what their business is and how exactly they should execute it, except maybe for simple text editors or simple charting tools? Where are the really useful tools that allow them to assess, understand, measure, change, communicate or even simulate their business models? Of course every manager and entrepreneur does have an intuitive understanding of how his business works and how value is created. In other words he does have an intuitive understanding of the company's business model, but even though this business model influences all important decisions, in many cases she or he is rarely able to communicate it in a clear and simple way (Linder and Cantrell 2000). And how can one decide on a particular business issue or change it, if it is not clearly understood by the parties involved? Therefore it would be interesting to think of a set of tools that would allow business people to understand what their business model is and of what essential elements it is composed of, tools that would let them easily communicate this model to others and that would let them change and play around with it in order to learn about business opportunities.

In the following three subsections I first try to show that the business model concept has become popular because of a business environment shaped by ICT and globalization and characterized by an increasing complexity and uncertainty that leaves managers with difficult decisions to make. Then I explain what business models actually are and how they can be situated in the company. Finally, in the last subsection I outline what they can be used for.

2.1 TECHNOLOGY, E-BUSINESS, COMPLEXITY AND UNCERTAINTY

I argue that the business model concept has become popular because today's managers are spoilt for choice when it comes to defining their value proposition, configuring their value network, choosing their partners, looking for ways to reach the customer and many other similar decisions. This has not always been the case and is essentially the outcome of the interaction between increasingly rapid technological change and globalization (Archibugi and Iammarino 2002). However, new technologies, globalization and the abundant reservoir of choices to configure a business makes managing an ever harder task (Zahra and O'Neill 1998). Today's business landscape is characterized by the intense use of ICT (e.g. for e-business), fierce global competition, rapid change and results in increasing complexity, high risk and greater uncertainty than ever before. Responding to these challenges described below I will later address how the business model concept can improve manageability of some of these issues in the sections 2.3 and 2.4.

2.1.1 Technological Change, e-Business and New Business Models

In the last decades science and technology have experienced an impressive advance. According to Hodgson (2003) this is inherent to capitalism. Competition pressures firms to pursue profits through two main means. Firstly, the conquest of new markets by geographical expansion and/or the introduction of new products, such as new technologies or skills. Secondly, by cutting costs through the adoption of new technologies and new skills (see Figure 5). Hodgson explains that "in this quest for innovation, the frontiers of science and technology are advanced, leading to new fields of knowledge and enquiry" (Hodgson 2003, p.471). Furthermore, he argues that because "services are generally more diverse than manufactured goods, diversity also increases with the increasing relative size of the service sector". And there is certainly no doubt that the contribution of the service sector to GDP and employment has become more and more important (OECD 2001).

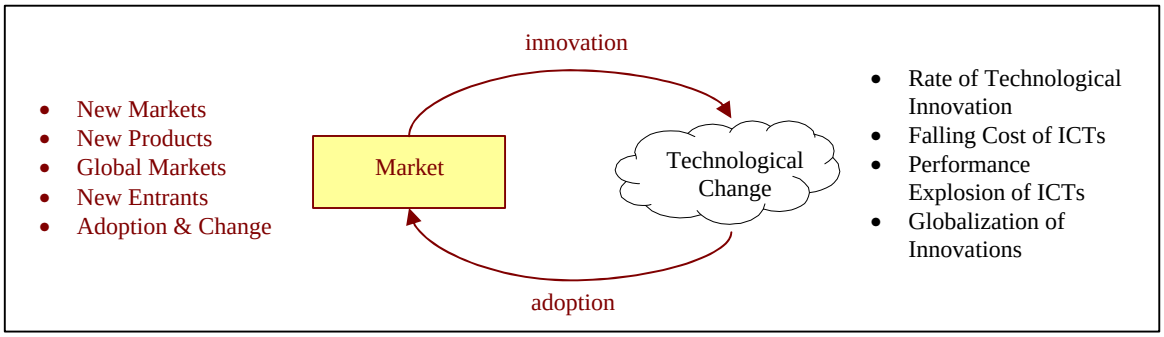


Figure 5: Competition and Technological Change

As a glance at the statistics shows, investment in ICT equipment and software has steadily grown over the last decades (OECD 2002). At the same time the cost of ICT hardware, software and services have fallen drastically, while their performance has exploded. Of course this has had an important impact on companies of every size, as they increasingly adopt and rely on ICT. Particularly the rise of the Internet in the 1990s and the adoption of e-business and e-commerce has drastically changed the way companies do business. As to definitions, e-commerce, or more properly electronic commerce, stands for the buying and selling of goods and services on the Internet, especially the World Wide Web. The more wider term e-business, or more properly electronic business, simply stands for the conduct of business on the Internet. In contrast to e-commerce this is not only buying and selling but also servicing customers and collaborating with business partners. E-business can be understood as a powerful extension of the more traditional EDI that predates today's Internet and stands for the exchange of business data using an understood data format.

As regards the effects of new ICTs, e-commerce and e-business, their impact has been the multiplication of possible business configurations and thus choices to make for managers. In contrast to the traditional organization of an industry where business models looked alike, the range of possible new business models in the ICT era have grown strongly. I argue that this increase in variety of business models is closely related to the adoption of ICTs in business.

ICT's impact has been fourfold. Firstly, affordable ICTs have reduced transaction and coordination costs as defined in transaction cost economics (Coase 1937; Williamson 1975). In other words, the costs of collaborating with partners (e.g. outsourcing) and integrating customers in the company's processes (e.g. customization, customer services) are not prohibitive anymore. This means that the traditionally isolated firm is shifting to new forms of network organizations. Based on a literature review Andriani (2001, p.261) explains that "this transition reflects the widely acknowledged phenomenon of disintegration of traditionally integrated structures of business into more complex networks of independent parts". The consequences for management are a much larger choice of possible business configurations. Secondly, ICT, e-commerce and e-business have made it possible to offer completely new products and services of which many have an important information component and which are frequently provided in collaboration by multiple companies (Evans and Wurster 1997). Thirdly, ICTs have made it possible to reach customers in new and innovative ways and through a multitude of channels. Also, the Internet has made it easier to conduct business on a global basis and theoretically reach and service customers at the remotest places of the planet. Finally, with the Internet and the Web a range of new pricing and revenue mechanisms have found the way into business practice (Verma and Varma 2003).

The list of ICT's impacts on business could probably be extended, but the main thing to be retained from the above is that these evolutions bring an important increase in choices and decisions that managers face in terms of business models. This explains the growing research in business models in general and business models with a strong ICT component (e.g. e-business).

2.1.2 Industry Clockspeed

Charles Fine (1998) has coined the term industry clockspeed. He shows that different industries and segments of them have their own pace of change in the life cycles of their products, production

processes, structural makeup and CEO tenure. These "clockspeeds" are essentially driven by technological change and competition. The consequence is that positions of competitive advantage last only for a certain time and leading companies sometimes lose this position because they do not or cannot adapt to change. Therefore, when change was slower, competitive advantage was longer-lasting. But in today's world of rapid change managers have to find new ways of keeping up with faster industry clockspeed.

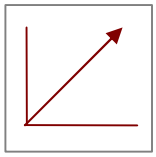
A research on the electronics industry has shown that clockspeed is a driver of organizational change (Mendelson and Pillai 1999). The authors of the research indicate how other industries are also experiencing increasing levels of business dynamics and they recommend learning from the electronics industry which leads the way. The question is of course what management tools to use in order to cope with this increasing clockspeed. Maybe the business model concept could help companies better adapt to change (see section 2.4.3). Though not focus of this dissertation, the question of rapid adaptation may be easier to answer on the basis of the contributions of this research.

2.1.3 Complexity

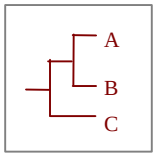
Another characteristic of today's business landscape is its complexity. According to Hodgson (2003) capitalism naturally leads to more complexity driven by powerful economic forces. Under this he understands a growing diversity of interactions between human beings and between people and their technology (Hodgson 2003). He also mentions "new and varied organizational forms devised to increase productivity and to manage an exponentially expanding number of products and processes" as drivers of complexity (Hodgson 2003, p.471). Indeed, the decomposition of the integrated company and the formation of business networks as described above has contributed to complexity because it is a mechanism that generates diversity (Andriani 2001). The business model concept may be one of the tools that helps tackling at least some aspects of complexity by highlighting important issues and pointing out the relationships between them (see section 2.4.1 and 2.4.4). Like every conceptualization and model the business model concept aims at representing reality in a structured, simplified and understandable way.

2.1.4 Uncertainty

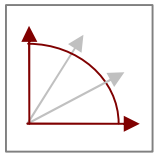
It is widely accepted that one of the effects of the communication technology revolution of the 1990s, coupled with the forces of globalisation and liberalisation, has been the increase in environmental risk and uncertainty that organisations have to face (Andriani 2001). As Wytenburg states "the greater the degree of complexity in an environment, the more various, dynamic, and unpredictable are those situations" (2001, p.118). The problem with uncertainty is that it increases the environmental risk that a company faces because the future becomes unpredictable. Referring to this Courtney, Kirkland et al. (1997) speak of four levels of uncertainty that managers face (see Theory Box 1). At the first level there is a single view of the future, at the second level one of several futures will occur, at the third level there is a range of possible futures and at the fourth level true ambiguity rules in regard to future. Managing uncertainty is probably one of the most important challenges that managers face today. Providing a specification of the conceptualization of business models could eventually improve scenario approcaches and one day lead to simulation. This would help managers to be better prepared for the future (see section 2.4.4).



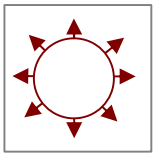
Level 1: clear enough future
Single view of the future



Level 2: alternative futures
Limited set of possible future outcomes, one of which will occur



Level 3: range of futures
Range of possible future outcomes



Level 4: true ambiguity
Not even a range of possible future outcomes

Theory Box 1: Four Levels of Uncertainty (Courtney, Kirkland et al. 1997)

2.2 WHAT ACTUALLY IS A BUSINESS MODEL

In this section I outline my understanding of the expression and concept of business models. This understanding is based on a careful literature review (see section 3.1), but may not be shared in detail by all the authors in business model research.

As the term business model intuitively suggests it has something to do with business and it has something to do with models. A quick lookup in the online version of the Cambridge Learner's Dictionary (Cambridge 2003) returns no result for the full combined term but the following definitions for the two separate terms:

- *business*: the activity of buying and selling goods and services, or a particular company that does this, or work you do to earn money.
- *model*: a representation of something, either as a physical object which is usually smaller than the real object, or as a simple description of the object which might be used in calculations.

Related to the first definition it can be said that the term *business* in the expression business model relates to "the activity of buying and selling goods and services" and "earning money". Related to the second definition it can be said that the term model relates to "a representation of something as a simple description of the object which might be used in calculations". By combining the two we get a first simple understanding which is that a business model is a representation of how a company buys and sells goods and services and earns money.

In general the purpose of creating a model is to help understand, describe, or predict how things work in the real world by exploring a simplified representation of a particular entity or phenomenon. Thus, in the case of a business model the model (i.e. representation) shall help understand, describe and predict the "activity of buying and selling goods and services" and "earning money" of a particular company. But as the notion buying and selling seems too narrow, I try to extend it. So differently put, the business model is an abstract representation of the business logic of a company. And under business logic I understand an abstract comprehension of the way a company makes money, in other words, what it offers, to whom it offers this and how it can accomplish this.

At this point it must be mentioned that some confusions exist concerning business models. The conceptual business model approach outlined in this dissertation is very abstract and quite different from so-called "business modeling", which is process related and with which it is often confused. This confusion comes from research and industry where the term business model is sometimes used for business process models (Gordijn, Akkermans et al. 2000). However, in the domain of process models a multitude of tools and concepts already exist, such as UML activity diagrams or Petri nets. In contrast, little concepts and tools exist that help companies and their managers specify their more conceptual business model (i.e. their business logic) on a higher level of abstraction.

It must also be mentioned that there is an ongoing discussion on the difference between strategy and business models (Stähler 2002; Seddon and Lewis 2003). Currently, there are different points of view that differ widely. In this dissertation I will not address this discussion and simply look at a business model as the translation of a company's strategy into a blueprint of the company's logic of earning money. Putting strategy, business models and process models together one can say that they address similar problems (e.g. the one of earning money in a sustainable way) on different business layers (see Figure 6). In general, such a multi-layer approach is quite common in IS.

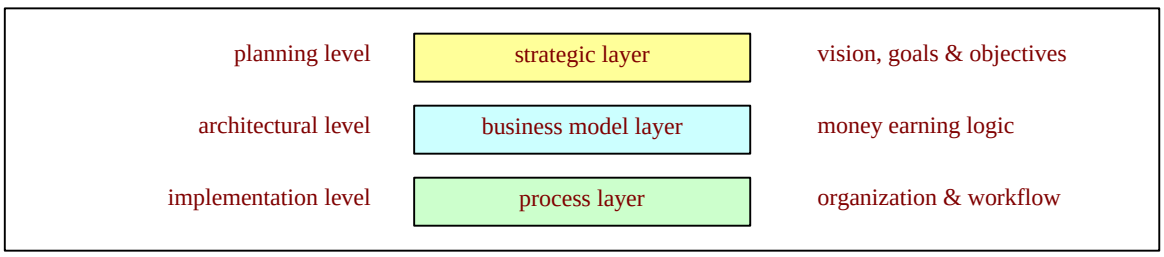


Figure 6: Business layers

For example Chandler (Chandler 1962; 1990) already themasized strategy and structure which would be typically located in the strategic layer. The business model layer would then translate these issues into the elements and relationships of the money earning logic of a company's business model.

Furthermore, there is a business model process going from design to implementation illustrated in Figure 7. The business model design translates a strategy into a business model blueprint. Then the business model has to be financed through internal or external funding (e.g. venture capital, cash flow, etc.). And finally it has to be implemented into an actual business enterprise.

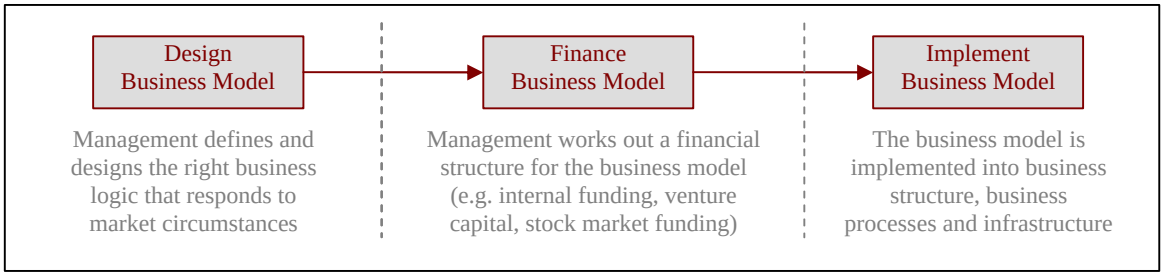


Figure 7: Business Model steps

A last common but important confusion related to the concept of business models is that many people speak about business models when they really only mean parts of a business model (Linder and Cantrell 2000). An online auction, for example, is not a business model, but a pricing mechanism, and, as such, part of a business model (admittedly sometimes a dominant part of the business model). Similarly, an online community is not a business model in itself, but part of the customer relationship. Or take revenue sharing. This is not a business model in itself either, but a way of exploiting partnerships to address the customer and distribute the resulting revenues. In my opinion a business model has to be understood as a much more holistic concept that embraces all such elements as pricing mechanisms, customer relationships, partnering and revenue sharing.

In a nutshell I describe a business model...:

- as an abstract conceptual model that represents the business and money earning logic of a company.
- as a business layer (acting as a sort of glue) between business strategy and processes.

But, the business model...:

- is not a guarantee for success as it has to be implemented and managed.
- is something else than the company's business process model (Gordijn, Akkermans et al. 2000).

After having defined what a business model is in this dissertation and what it isn't, it is of course of interest to define what belongs into a business model. This can be equated with the quest of defining a generic business model with all its elements and relationships. This will be subject of section 4 of this dissertation. Obviously, and as this domain of research is still quite young, there are differing opinions among business practitioners and academicians on what these elements and relationships are. For the moment, until providing more details in section 4, let me use the following working definition for business models:

A business model is a conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams.

A last thing that must be considered when talking about business models is their type. Similar to Linder and Cantrell (2000) I distinguish between three different types. First, there is the abstract business model concept, which is a generic model of elements, components and relationships. Second

there are the operating business models that are the implemented and existing business models of different companies. In other words, they represent an instance of the generic business model. Finally, there are the scenario business models that are only virtual, not existing as such in the real world. They can serve different ends like fostering innovation, simulating opportunities or acting as a guideline in change management. They represent a virtual instance of the generic business model.

2.3 THE BUSINESS MODEL'S PLACE IN THE COMPANY

In order to get a better understanding of the business model and its role, it is important to explain how it is situated in the company. As mentioned in the previous section the business model is a conceptualization of the money earning logic of a firm. As such it can function as a conceptual link, forming a triangle between strategy, business organization and ICT (see Figure 8). Because there is often quite a substantial understanding gap between these three "worlds", the business model concept could serve as a federator or glue.

As illustrated in Figure 8, business strategy, business organization and ICT look at the firm from different angles and on different business layers. These categories also often regroup different groups of employees with different preoccupations and worldviews. Business people position the company in the market define the direction and formulate objectives and goals, whereas business process and ICT designers have to understand and implement these visions into something more concrete. In order to guarantee a smooth implementation of business visions and alignment between the different groups, firms require a very clear communication of concepts and understandings between the implicated parties. This is where conceptually defined business models come into play. By using an ontological approach to business modeling, one can create a shared and common understanding of what a company does to earn money and facilitate communication between people and heterogeneous and widely spread application systems (Fensel 2001).

The triangle and the business model are subject to continuous external forces (Figure 8). Among others these forces include competition, legal, social or technological change and changes in customer demand. It is the manager's role to design or adapt a company's business model by responding to these external forces.

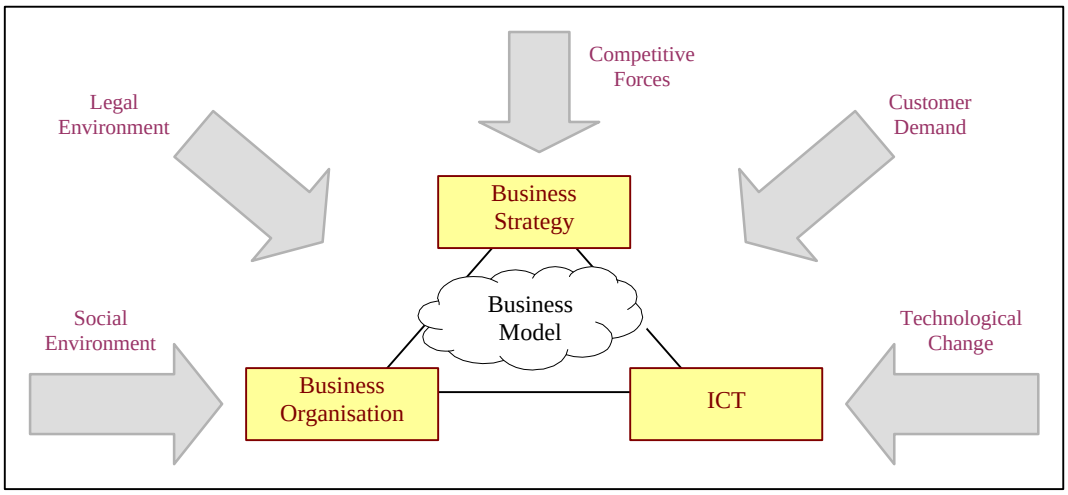


Figure 8: Environment, Business Models, Strategy, Process and Information Systems

2.3.1 Strategy and Business Models

The first element in the triangle described above is business strategy. Mintzberg and Lampel (1999) describe strategy as an elephant of which we can only grab hold of some part or other. This is a nice metaphor for the fact that business strategy is an enormous domain in which little consensus exists and a variety of schools reign. Different views include that strategy is about providing a company vision, designing an organization that achieves a fit between internal strengths and weaknesses and external threats and opportunities (Learned, Christensen et al. 1965), positioning the company in the market (Porter 1985), defining a set of goals and objectives (Drucker 1954; Kaplan and Norton 1992), the

steps to achieve them and the way to measure them (Kaplan and Norton 1992).

In this dissertation I argue that the business model and strategy talk about similar issues but on a different business layer. I understand the business model as the strategy's implementation into a conceptual blueprint of the company's money earning logic. In other words the vision of the company and its strategy are translated into value propositions, customer relations and value networks (see Figure 9).

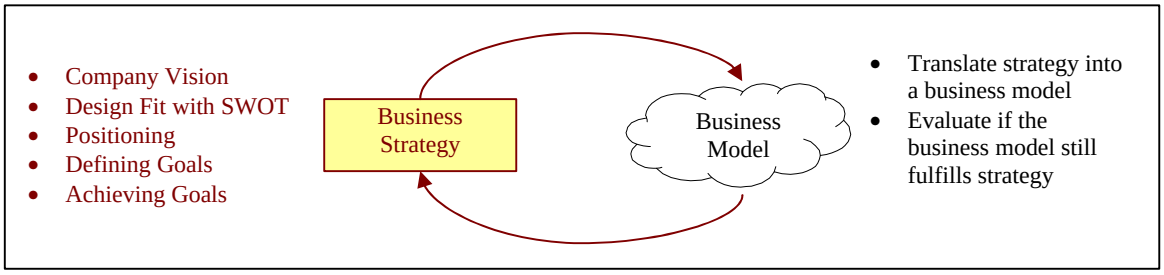


Figure 9: Business Strategy and Business Model

2.3.2 Business Organization and Business Models

The second element of the triangle surrounding business models is the organizational side. Similarly to strategy and business model layer the business organization layer talks about similar issues (e.g. structure) but addresses them from a different angle. The business organization is about the "material" form the conceptual business model takes in the world, such as departments, units and workflows (see Figure 10). This is not to be confused with the business model, which illustrates a company's money earning logic as a set of concepts. Yet, the business organization and business model are closely interrelated (see Illustration Box 1).

Compaq vs. Dell

The then dominating computer manufacturer Compaq (now HP) came under pressure by Dell in the 90s, when this competitor was extremely successful with its direct-to-customer approach that heavily relies on the Internet. Compaq was forced to rethink its strategy because it was constantly losing ground in the PC market. As an apparently logic consequence Compaq introduced its own direct Internet distribution channel on the Internet into its business model. However, the company forgot to align this new business model with its business organization. The outcome was a hostile reaction from its resellers, who said that Compaq was competing with them.

Illustration Box 1: Business Organization and Business Model at Compaq

Changes in the business model bring up organizational questions, which is illustrated by the fact that companies didn't really know how to structurally cope with their new online outlets in the 90s. When a large number of companies started selling over the Internet they used different organizational approaches regarding their new online channels. Some created entirely new departments, others put their existing IT department in charge and yet others created completely new companies in which they had a majority stake.

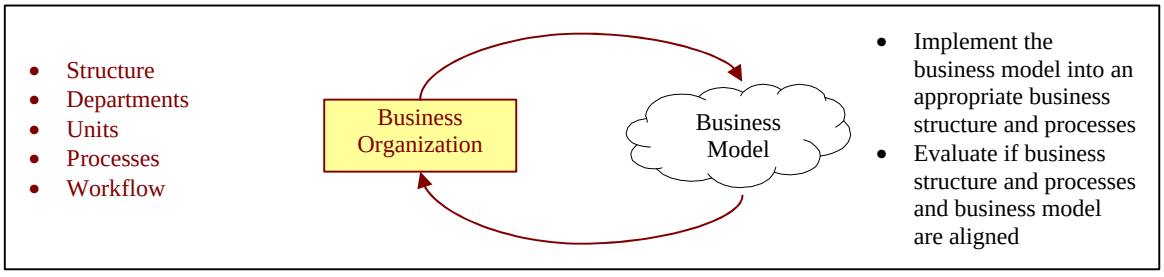


Figure 10: Business Organization and Business Model

Furthermore, a good understanding of the infrastructure side of a business model leads to an optimized business organization. By precisely defining infrastructural aspects of a business models, such as the supply chain and the various partnerships and links a company maintains it becomes much easier to address questions related to processes or, for example, business process outsourcing (BPO).

2.3.3 ICT and Business Models

The last element in the triangle is technology, or more precisely ICT. Under ICT I understand all the information and communication technology used in the company. This includes hardware, such as PCs, servers, PDAs and mobile phone as well as software and tools, such as Websites, customer relationship management applications, management information systems and so on. The link between ICT and business models is particularly strong, since ICT has been a strong enabler for a variety of innovative business models (cf. section 2.1).

Relying on ICT: Amazon.com and eBay

The most extreme examples of the relationship between ICT and business model are web-based companies like Amazon.com or eBay. They have business models that rely to a great deal on ICT and specifically the Internet. Besides the most evident dependencies on websites and servers they also improve their business model through a number of customer related applications, like personalized recommendations or rankings.

Illustration Box 2: Relying on ICT

Sometimes the link between ICT and business model is evident as in the case of online companies such as Amazon.com or eBay (see Illustration Box 2). However, the link between technology and business model does not have to be so obvious. When communication and coordination costs dramatically decreased because of shrinking ICT costs, this had an enormous indirect impact on business models. It became much easier for companies to work in networks and offer joint or complementary value propositions. Also, companies increasingly included informational aspects or even ICT enriched components into their products and services.

In general, technology people should ask themselves how ICT can contribute to improving a company's business model. And the other way around, business people should ask themselves what technological consequences a change in the business model could have (see Figure 11).

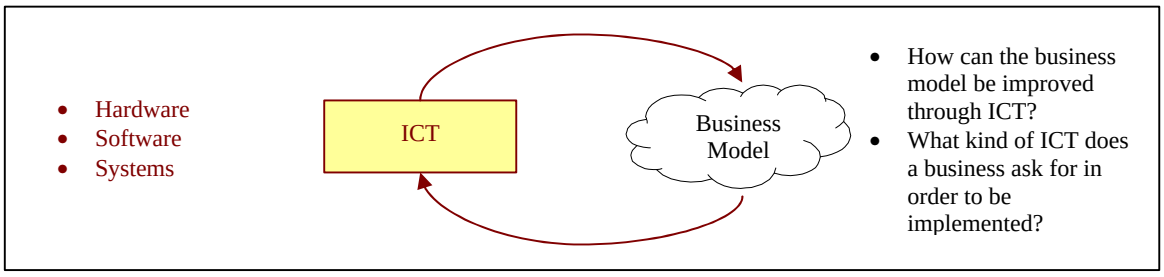


Figure 11: ICT and Business Model

2.3.4 Environment and Business Model

Besides relating to the elements in the triangle a company's business model is continuously subject to external pressures that oblige a company to constantly adapt their business model to a changing environment. In this section I list some of these pressures that directly or indirectly influence a business model. Namely, these are technological change, competitive forces, change in customer demand and change in the social or legal environment.

Technological change. As shown in section 2.1 on technology and change, technology (e.g. ICT) and its application in business is rapidly changing. And since technology is increasingly applied to every aspect of business, technological change pressures managers to reflect on how technology can be adopted to improve the business logic of the firm. With the rise of the Internet companies started

adopting new web-based channels. Some even tried to figure out how their products could be entirely digitized or at least "digitally enhanced". Also, falling communication and coordination costs due to cheaper technology have forced companies to become more efficient. They started to outsource all non-essential business and progressively rely on partnerships. I think it is no understatement to say that technological change is a major force of business model change. In some cases technological change may even challenge the mere existence of a particular business model.

Competitive forces. A second-major pressure on a company's business model comes from its competitors. I have already discussed the example of Compaq and Dell that competed for customers with two different business models in the PC-industry. For traditional industry players adapting to changes in the competitive environment is especially crucial when new dynamic competitors rapidly dispute their market position as an incumbent (cf. Christensen 1997; Christensen 2003).

Customer demand. Pressure to adapt a company's business model may also come from the customer demand side. Changes in consumption patterns, revenue increases and "fashion changes" are just some of the possibilities I want to mention. The shift from fixed-line to mobile telephony is a nice example of change in customer demand.

Social environment. Sometimes the social environment and social mood can influence the business model of a firm. This kind of pressure is particularly studied in stakeholder theory (Friedman and Miles 2002). For instance, if a company's business model is centered around low cost production in developing countries it might draw the attention of militant non-governmental organizations that could mobilize public opinion against the firm. This happened to Nike regarding the ethics of its operations in Vietnam (Kahle, Boush et al. 2000). Besides ethics, changes in the social environment will also have an indirect influence on customer demand. This is the case for technology adoption, where the use and social acceptance of a specific technology by a broad majority opens up completely new markets and customer demands (Moore 1999).

Legal environment. Often changes in the legal environment also make it necessary to adapt business models. The introduction of new privacy laws can make the use of some business models illegal, if a company has extensively relied on customer information without the customer's explicit accordance. Anti-spamming laws may (hopefully) wipe-out business models based on sending out large trunks of unsolicited mails. Regulating advertisement over mobile phones may limit the range of possible business models in m-commerce. New taxes may make a company's value proposition too costly and thus uninteresting for the customer. In general it can be said that the legal environment has a large influence on business models.

2.4 USE OF BUSINESS MODELS

Business model research is a rather young research domain and still has to prove its relevance. But as addressed above, yet relatively little concepts and tools exist to help managers capture, understand, communicate, design, analyze and change the business logic of their firm. In my opinion and the opinion of many other researchers in this domain the business model concept can fill some of this gap and can eventually gain an important position in managing under uncertainty.

In the following sections I will outline some of the roles the business model concept (i.e. the use of a specification of a conceptualization of business models) can play in business management, and, particularly in regard to e-business issues. I have identified five categories of functions, which are understanding & sharing, analyzing, managing, prospects and patenting of business models. Furthermore, an ontological approach to business models is indispensable for building software based tools that help fulfill these five functions.

I describe these categories to give an outlook on what could be done with the help of the business model concept, particularly on the base of the business model ontology. The scope of this dissertation, however, is the design of a business model ontology. The possible roles of the business model concept will not be further specified beyond this outlook except for the propositions on further research in section 8.

2.4.1 Understand and Share

The first area in which business models can contribute is in understanding and sharing the business logic of a firm. Concretely, business models help to capture, visualize, understand, communicate and share the business logic.

Capture. As explained earlier, the business model of a company is a simplified representation of its business logic. However, as such business models exist only as abstract concepts or mental models in the head of people reasoning on them. Yet, experience shows that in many cases these people are not always capable of communicating this business model in a clear way (Linder and Cantrell 2000). Furthermore, because people have different mental models they will not automatically understand the same thing under a business model. Thus, a generic framework (i.e. an ontology) for describing business models becomes necessary. Such a framework can be understood as a common language between stakeholders to get the ideas out of their heads in order to formulate them in a way that everybody understands.

Visualize. Human's ability to successfully process complex information is quite limited. As can be shown theoretically and empirically, processing information through the visual system can substantially increase the degree to which complexity can be handled successfully (Rode 2000). Using an ontology to capture business models, means that with little additional effort they can be presented graphically (Gordijn and Akkermans 2003).

Understand. Nowadays business models are increasingly complex, particularly those with a strong ICT and e-business component. The relationship between the different elements of a business model and the decisive success factors are not always immediately observable. Therefore the process of modeling social systems and in this case business models help identifying and understanding the relevant elements in a specific domain and the relationships between them (Morecroft 1994; Ushold and King 1995). In addition, the visual representation of a business model can dramatically enhance understanding.

Communicate and share. I have already made a point that the business model concept helps capturing, understanding and visualizing the business logic of company. Being able to communicate and share this understanding with other stakeholders is simply a logical consequence of the foregoing. Formalizing business models and expressing them in a more tangible way clearly help managers to communicate and share their understanding of a business among other stakeholders (Fensel 2001).

2.4.2 Analyze

The second area in which the business model concept can contribute is in analyzing the business logic of a company. Concretely, they can improve measuring, observing and comparing the business logic of a company.

Measure. Having captured the business model in a first step it may become easier to identify the relevant measures to follow in order to improve management. Similar to the Balanced Scorecard Approach (Kaplan and Norton 1992) a business model shows which areas to monitor in a particular business. This is all the more relevant since in e-business the indicators to follow are still an issue of debate.

Observe. The business logic of a company constantly changes due to inside and outside pressures, as shown in section 2.3.4. Therefore a structured approach to business models is important in order to understand which particular issues have changed over time.

Compare. Similar to observing a company's business model over time, a structured approach allows companies to compare their business model to the ones of their competitors. This is based on the reasoning that things are only comparable if they are seized and understood in the same way. Also, comparing one's business model to the one of a company in a completely different industry may help gaining new insights and foster business model innovation. Related to e-business and to dynamic industries this can help incumbents understand how aggressive new competitors and startups work.

2.4.3 Manage

The third area of contribution of business models is in improving the management of the business logic of the firm. The business model concept helps ameliorating the design, planning, changing and implementation of business models. Additionally, with a business model approach companies can react faster to changes in the business environment. Finally, the business model concept improves the alignment of strategy, business organization and technology.

Design. Designing a coherent business model where all the elements are mutually reinforcing or at least optimized is not an easy task. Nowadays business models are quite complex and their success is often based on the interaction of a number of apparently minor elements. This is even more the case since e-business increases the range of imaginable business models. Having a business model ontology at hand that describes the essential building blocks and their relationships will make it easier for managers to design a sustainable business model.

Plan, Change & Implement. When a company decides to adopt a new business model or to change an existing one, capturing and visualizing this model will improve planning, change and implementation (see Figure 12). It is much easier to go from one point to an other, when one can exactly understand, say and show what elements will change. In this regard, Linder and Cantrell (Linder and Cantrell 2000) speak of so-called change models that are the core logic for how a firm will change over time to remain profitable in a dynamic environment.

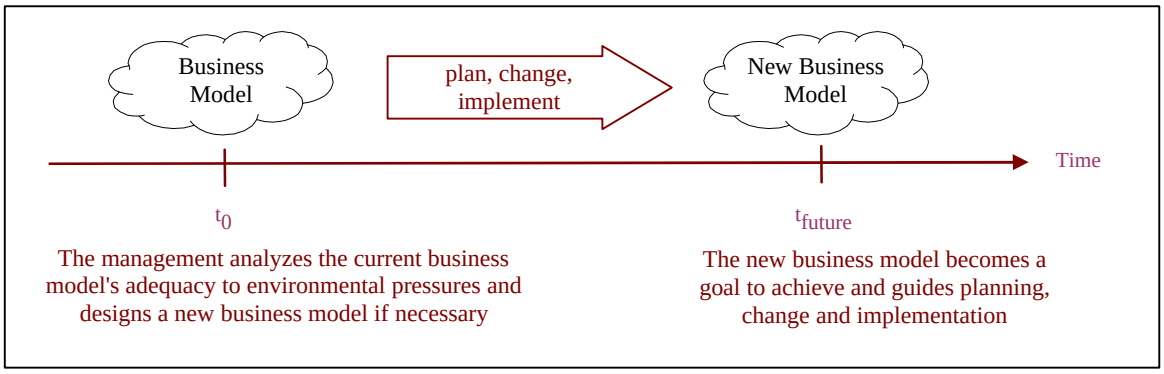


Figure 12: Planning, Changing and Implementing Business Models

React. Once a business model has been captured, mapped and understood by managers the foundations for improving speed and appropriateness of reaction to external pressures have been created. According to Petrovic and Kittl (2001), business model designers can easily modify certain elements of an existing business model. This is without doubt essential in an uncertain and rapidly changing competitive landscape.

Align. I have already argued earlier that the business model concept can serve as a federator between the triangle of business strategy, business organization and technology. In other words, the business model forms a sort of conceptual bridge that makes it easier to align these three. Chesbrough and Rosenbloom (2000), for example, see business models as a mediating construct between technology and economic value.

Improve decision-making. Having claimed that the business model concept enhances understanding and communicating the business logic of the firm I deduce that decision makers make more informed, and hence, better decisions. Asides from this, business models are a new unit of analysis (Stähler 2002) that can be observed and compared, help defining measures and should therefore also improve decisions.

2.4.4 Prospect

A fourth area of contribution of business models refers to the possible futures of a company. I believe that the business model concept can help foster innovation and increase readiness for the future through business model portfolios and simulation.

Innovate. Similar to the argument of improving change and increasing reaction capacities in the firm, I believe that a conceptual and modular business model approach can foster innovation. In fact, specifying a set of business model elements and building blocks, as well as their relationships to each other, is like giving a business model designer a box of Lego stones. He can play around with these stones and create completely new business models, limited only be his imagination and the pieces supplied. Amit and Zott (2001) explicitly perceive the business model as a locus of innovation.

Business model portfolio. Based on Allen's law of excess of diversity in evolutionary theory (Allen 2001) one may argue that it could be interesting for a company to maintain a portfolio of business models in order to be ready for the future. The idea behind Allen's law is that a sustainable and successful evolutionary strategy requires an amount of internal diversity superior to that of the environment. Allen suggests that agents need to have a stock of potential strategies to be set off in the face of unpredictability in environmental change (Andriani 2001). In the case of a company this would mean having a stock of business models in order to cope with change.

Simulate and test. Simulating and testing business models is obviously the dream of every manager. Though simulation will never be able to predict the future, it is a way of doing risk free experiments, without endangering an organization (Sterman 2000). By simulating and testing possible business models, managers will be better prepared for the future. Similarly, in the domain of e-business Richards and Morrison (2001) compare this kind of simulation tool to a sort of flight simulator that allows building better e-business strategies.

2.4.5 Patenting

Increasingly entrepreneurs and companies in e-business seek to patent e-business processes and even entire aspects of their business model. Therefore business modeling may potentially have an important role to play in this legal domain. For example, Priceline based much of its business strategy on a patent whose technology matches bids from buyers with interested sellers on the Net (Angwin 2000). Consequently, patenting of e-business methods has also started to create a number of legal battles. A famous one is the case between the online retailer Amazon.com and the online arm of the bookseller Barnes & Noble (B&N). Amazon.com, who received a patent for its "one-click" ordering system attacked B&N for patent infringement, supposedly caused by its "express lane" checkout system on the B&N website (Lesavich 2001). It remains to be seen in what direction patenting business models and business processes moves.

2.5 BUSINESS MODEL ONTOLOGY AND BUSINESS MODEL TOOLS

A last but fundamental area of contribution of business models is in building the foundation for a set of new computer-assisted management tools. Management literature is famous for producing concepts and models. Yet, little of these concepts have been translated into software-based tools, although, in my opinion this could bring enormous value to management. For instance, some of the business model functions mentioned above principally make sense in a digitized version. Visualizing, designing and comparing business models can be done quickly, once software-based tools have been developed. More complex tasks, such as simulation are simply impossible without the help of computers.

But in order to be able to use computer assistance as outlined above, an ontology of the business model domain has to be provided. And this is exactly one of the aims of this dissertation (see section 1.2). Once the elements and relationships of the business model concept have been defined one can start building a set of software-based tools to simplify the life of managers.

3 KNOWLEDGE OF THE PROBLEM DOMAIN

The two main domains that serve as a foundation for this thesis are management theory and Information Systems. More precisely, the first part of the dissertation treating of the business model ontology (section 4) is built on inputs from business model literature in management theory and enterprise ontologies in IS. The part of the dissertation treating of business strategy, IS alignment and e-business essentially draws from alignment theory in IS (section 8.1).

3.1 BUSINESS MODEL LITERATURE

In this section I explore the existing business model literature. The material treating of business models ranges from business model definitions, components, taxonomies, design tools, change methodologies to evaluation measures.

Surprisingly, the mainstream appearance of the term business model is a relatively young phenomenon that has found its first peak during the Internet hype at the beginning of this millennium. A query in Business Source Premier, a leading electronic database for business magazines and scholarly business journals, shows that the term appeared in 1960 in the title and the abstract of a paper in the Accounting Review (Jones 1960). But as Figure 13 shows, the boom of the expression business model has taken place in the 1990s with 144 occurrences in abstracts and 29 appearances in the title of peer-reviewed articles in the year 2003 in the Business Source Premier database of scholarly business journals (see also (Stähler 2002)). The term is found in numerous variations, such as “new business models”, “e-business models” or “internet business models”. However, it can be said that the expression was inflated through journalists, business people and academics that used it in relationship with e-commerce, start-up companies and high tech companies. It seems that the executives, reporters, and analysts who used the term “business model” never really had a clear idea of what it meant. They sprinkled it into their rhetoric to describe everything from how a company earns revenue to how it structures its organization (Linder and Cantrell 2000). An interview with the CEO of a small Internet startup confirmed this impression: “*I’m happy that somebody is trying to define the term business model. It was one of the most violated terms. Everything was a business model. Everybody asked me what a business model is. I could never really define it. It is good that somebody is looking at this*” (cf. section 7.2).

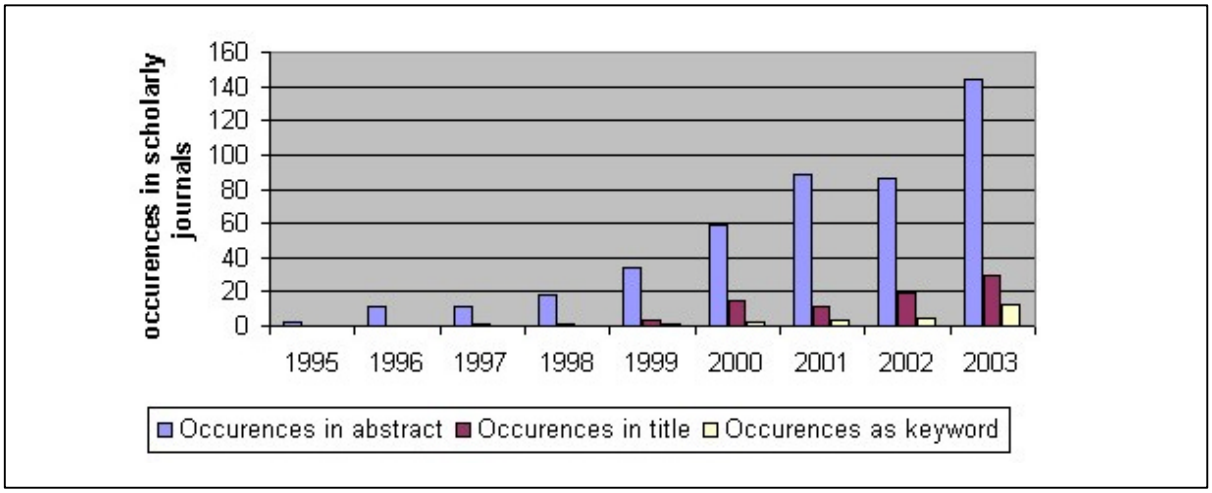


Figure 13: Occurrences of the term business model

So the first step to this dissertation was a thorough review of the existing literature on business models. Therefore, in the following sections I analyze how the concept of business models has been defined in literature, how business models have been classified, what components they are composed of and what modelling efforts have been put into business modelling. Further, I analyze the literature that mentions business models as a business design tool, as a change methodology and as a means to evaluate and measure. For facilitation I use the term business model interchangeably with the different expressions used by the different authors. I assume that the "e" in e-business model is a temporary

phenomenon that will disappear in time because most business models will have some ICT component.

Authors	Definition	Taxonomy	Components	Representation Tool	Ontological Modeling	Change Methodology	Evaluation Measures
(Afuah and Tucci 2001; 2003)	X		X				X
(Alt and Zimmermann 2001)		X	X				
(Amit and Zott 2001)	X						
(Applegate 2001)	X	X					
(Bagchi and Tulskie 2000)							
(Chesbrough and Rosenbloom 2000)			X				
(Gordijn 2002)				X	X	X	X
(Hamel 2000)			X				X
(Hawkins 2001)	X						
(Linder and Cantrell 2000)	X	X	X			X	
(Magretta 2002)	X		X				
(Mahadevan 2000)			X				
(Maitland and Van de Kar 2002)			X				
(Papakiriakopoulos and Poulymenakou 2001)						X	
(Peterovic, Kittl et al. 2001)	X		X			X	
(Rappa 2001)	X	X					
(Stähler 2002)			X				
(Tapscott, Ticoll et al. 2000)	X	X		X		X	
(Timmers 1998)	X	X					
(Weill and Vitale 2001)	X	X	X	X			

Table 2: Business model authors list (partially based on (Pateli 2002))

Table 2 summarizes the contributions of the most important business model authors. The first two columns of the table name author and year of contribution and the following columns reveal the major business model areas covered and whether a specific author has contributed to this area. The first "definition" column shows if an author provides a short comprehensible definition of what a business model is. The "taxonomy" column indicates which authors propose a classification of business models. The "components" column points out authors that go beyond a simple definition and classification of business models by presenting a conceptual approach to business models, proposing a set of business model components. Simply put, they specify of what a business model is composed of. The "representation tool" column specifies authors that offer a set of tools or graphical representations to design business models. The "ontological modelling" column indicates authors that use a rigorous modelling approach to business models. Authors present in this category provide an ontology that carefully defines business model concepts, components and relationships among components. The "change methodology" column points to authors including a time and change component in their business model concepts. Finally, the "evaluation measures" column indicates authors that try to define indicators to measure the success of business models.

3.1.1 Business Model Definitions

The first column of Table 2 covers business model definitions. Paul Timmers, then working for the European Commission, was one of the first to explicitly define and classify business models (Timmers 1998). He understands a business model as the architecture for the product, service and information flows, including a description of the various business actors and their roles and a description of the potential benefits for the various business actors and a description of the sources of revenues. In order to understand how a company realizes its business mission he adds a marketing model that is the combination of the business model and the marketing strategy of the business actor under consideration. Like Timmers, Weill and Vitale (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 and it identifies the major flows of product, information, and money, as well as the major benefits to participants.

In their business model definition Linder and Cantrell (2000) from the Accenture Institute for Strategic Change differentiate between three different types of models: the components of a business model, real operating business models and change models. They define a business model as an organization's core logic for creating value. Similarly, Petrovic, Kittl et al. (2001) perceive business models as the logic of a business system for creating value. They specify that this is in opposition to a description of a complex social system itself with all its actors, relations and processes. Referring to this Gordijn, Akkermans et al. (2000) mention that in research as well as in industry practice, often business models are wrongly understood as business process models, and so can be specified using UML activity diagrams or Petri nets. They explain that this is a misunderstanding and that a business model is not about processes but about value exchanged between actors. In their opinion the failure to make this separation leads to poor business decision-making and inadequate business requirements.

Like Petrovic, Kittl et al. (2001) Applegate (2001) perceives a business model as a description of a complex business that enables the study of its structure, of the relationships among structural elements, and of how it will respond to the real world. In this regard Stähler (2002) reminds that a model is always a simplification of the complex reality. It helps to understand the fundamentals of a business or to plan how a future business should look like. Magretta (2002) adds that a business model is like a story that explains how an enterprise works. And like Stähler she distinguishes the concept of business models from the concept of strategy. She explains that business models describe, as a system, how the pieces of a business fit together, but as opposed to strategy do not include performance and competition.

Tapscott, Ticoll et al. (2000) do not directly define business models, but what they call b-webs (business webs). A b-web is a business on the internet and represents a distinct system of suppliers, distributors, commerce service providers, infrastructure providers, and customers that use the Internet for their primary business communication and transactions. Similarly, another highly network-centered approach is provided by Amit and Zott (2001). They describe a business model as the architectural configuration of the components of transactions designed to exploit business opportunities. Their framework depicts the ways in which transactions are enabled by a network of firms, suppliers, complementors and customers.

A series of authors introduce a financial element into their definitions. Afuah and Tucci (2003) state that each firm that exploits the Internet should have an Internet business model. They understand it as a set of Internet- and non-Internet-related activities that allow a firm to make money in a sustainable way. Hawkins (2001) describes a business model as the commercial relationship between a business enterprise and the products and/or services it provides in the market. He explains that it is a way of structuring various cost and revenue streams such that a business becomes viable, usually in the sense of being able to sustain itself on the basis of income it generates. Rappa (2001) defines a business model as the method of doing business by which a company can sustain itself -- that is, generate revenue. For him the business model spells-out how a company makes money by specifying where it is positioned in the value chain.

3.1.2 Business Model Taxonomies

Apart from definitions a number of authors provide us with business model taxonomies. This means that they classify business models with a certain number of common characteristics in a set of different categories. The probably best known classification scheme and definition of electronic business models is the one of Timmers (1998). He distinguishes between eleven generic e-business models and classifies them according to their degree of innovation and their functional integration (see Figure 14). The models are e-shops, e-procurement, e-malls, e-auctions, virtual communities, collaboration platforms, third-party marketplaces, value chain integrators, value-chain service providers, information brokerage and trust and other third-party services (see Table 3).

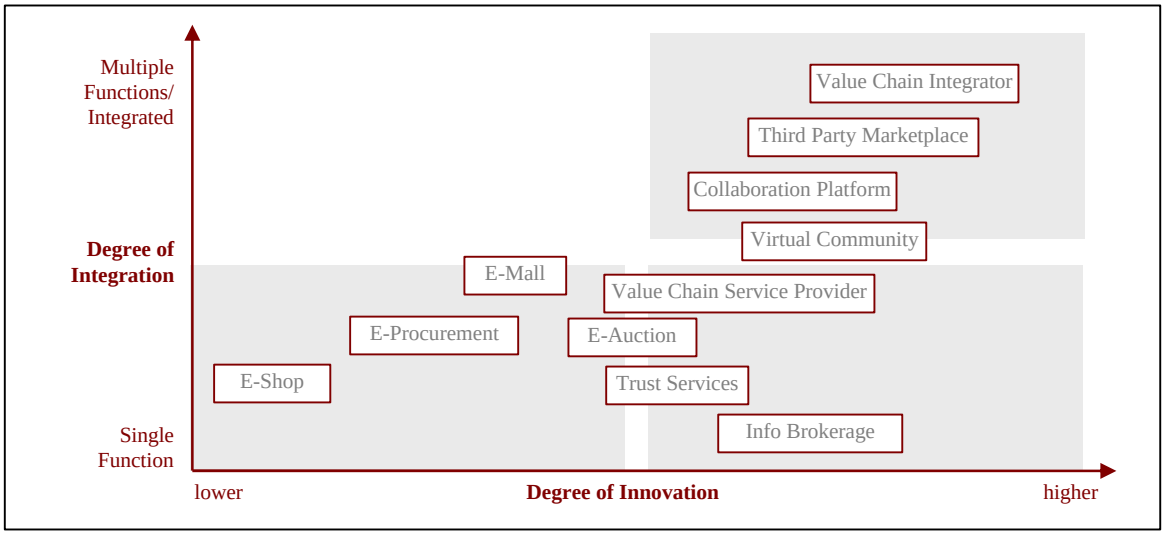


Figure 14: Figure: Timmer's (1998) classification scheme

Category	Description
e-Shops	Stands for the Web marketing and promotion of a company or a shop and increasingly includes the possibility to order and to pay.
e-Procurement	Describes electronic tendering and procurement of goods and services.
e-Malls	Stands for the electronic implementation of the bidding mechanism also known from traditional auctions.
e-Auctions	Consists of a collection of e-shops, usually enhanced by a common umbrella, for example a well-known brand.
Virtual communities	This model brings together virtual communities that contribute value in a basic environment provided by the virtual community operator. Membership fees and advertising generate revenues. It can also be found as an add-on to other marketing operations for customer feedback or loyalty building.
Collaboration platforms	Companies of this group provide a set of tools and information environment for collaboration between enterprises.
Third-party marketplaces	A model that is suitable when a company wishes to leave the Web marketing to a 3rd party (possibly as an add-on to their other channels). Third-party marketplaces offer a user interface to the supplier's product catalogue.
Value chain integrators	Represents the companies that focus on integrating multiple steps of the value chain, with the potential to exploit the information flow between those steps as further added value.
Value-chain service providers	Stands for companies that specialize on a specific function for the value chain, such as electronic payment or logistics.
Information brokerage	Embraces a whole range of new information services that are emerging to add value to the huge amounts of data available on the open networks or coming from integrated business operations.
Trust and other	Stands for trust services, such as certification authorities and electronic notaries

third-party services	and other trusted third parties.

Table 3: Timmer's architectures of business models (Timmers 1998)

Alt and Zimmermann (2001) point out that there are two major categories of business models, one based on the object of the business model and the other based on the purpose of the business model. The first group includes market and role models, sector and industry models and finally revenue models. The second group includes business models, reference models and simulation models.

Tapscott et al. (2000) proposes a network- and value-centered taxonomy that distinguishes between five types of value networks, which differ in their degree of economic control and value integration (see Figure 15 and Table 4). They call these types b-webs (business webs). The first one, the so-called Agora facilitates exchange between buyers and sellers, who jointly discover a price through on-the-spot negotiations (e.g. eBay). In the second type, the Aggregation b-web, one company leads in hierarchical fashion, positioning itself as a value-adding intermediary between producers and customers (e.g. Amazon.com). In the third b-web, the Value Chain, a context provider structures and directs the network to produce highly integrated value propositions (e.g. Dell). The fourth network, the Alliance, strives for high value integration without hierarchical control (e.g. Linux). The last type, Distributive Networks, keeps the economy alive and mobile (e.g. FedEx).

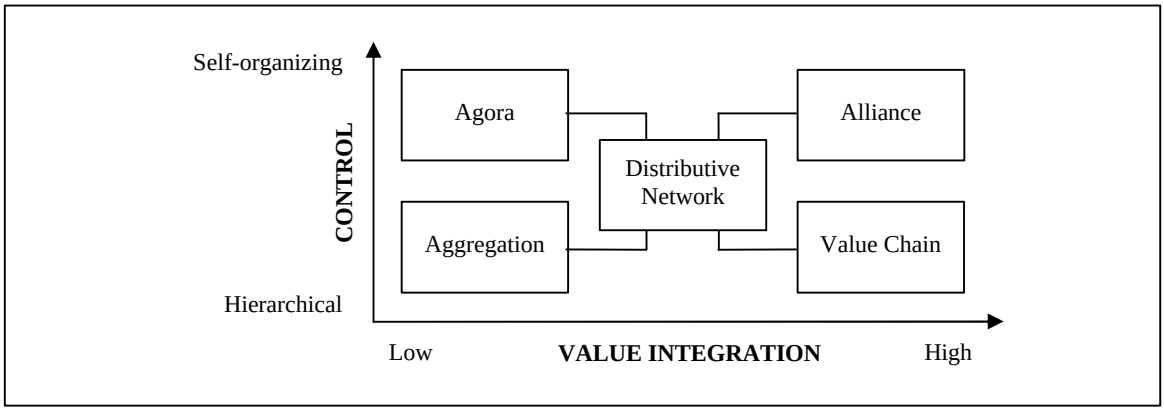


Figure 15: b-webs (Tapscott, Ticoll et al. 2000)

Type of b-web	Description
Agora	Applies to markets where buyers and sellers meet to freely negotiate and assign value to goods. An Agora facilitates exchange between buyers and sellers, who jointly "discover" a price. Because sellers may offer a wide and often unpredictable variety or quantity of goods, value integration is low.
Aggregation	In Aggregation b-webs there is a leader that takes responsibility for selecting products and services, targeting market segments, setting prices, and ensuring fulfillment. This leader typically sets prices in advance and offers a diverse variety of products and services, with zero to limited value integration.
Value Chain	In a Value Chain, the so-called context provider structures and directs a b-web network to produce a highly integrated value proposition. The seller has the final say in pricing.
Alliance	An Alliance strives for high value integration without hierarchical control. Its participants design goods or services, create knowledge, or simply produces dynamic, shared experiences. Alliances typically depend on rules and standards that govern interaction, acceptable participant behavior, and the determination of value.
Distributive Network	Distributive Networks are b-webs that keep the economy alive and mobile. They play a vital role in ensuring the healthy balance of the systems that they support. Distributive Networks service the other types of b-webs by allocating and delivering goods.

Table 4: Taxonomy of b-webs (Tapscott, Ticoll et al. 2000)

Linder and Cantrell (2000) propose categorizing business models focusing on two main dimensions, which are a model's core, profit-making activity, and its relative position on the price/value continuum (see Table 5).

Business Model Category	Business Models
Price Models	Buying Club, One-stop, low-price shopping Fee for advertising, Razor and blade
Convenience Models	One-stop, convenient shopping, Comprehensive offering, Instant gratification
Commodity-Plus Models	Low-price reliable commodity, Mass customised commodity, Service-wrapped commodity
Experience Models	Experience selling, Cool brands
Channel Models	Channel maximisation, Quality selling, Value-added reseller
Intermediary Models	Market aggregation, Open market-making, Multi-party market aggregation
Trust Models	Trusted operations, Trusted product leadership, Trusted service leadership
Innovation Models	Incomparable products, Incomparable services, Breakthrough markets

Table 5: Linder and Cantrell's (2000) categorization of business models

Weill and Vitale (2001) describe eight so-called atomic business models. Each model describes a different way of conducting business electronically. They describe these atomic e-business models as the basic building blocks of an e-business initiative (see Table 6).

Atomic Business Model	Description
Content Provider	Content providers are firms that create and provide content (information, products, or services) in digital form to customers via third parties.
Direct to Customer	In this model, the buyer and seller interact directly often bypassing traditional channel members.
Full-Service Provider	Firms in this category provide total coverage of customer needs in a particular domain, consolidated via a single point of contact. Domains cover any area where customer needs cover multiple products and services, such as financial services or health care.
Intermediary	The intermediary links multiple buyers and sellers. Usually the sellers pay the intermediary listing fees and selling commissions and it is possible that the buyer may also pay a purchase or membership fee. Advertisers also provide revenue for intermediaries. There are six major classes of intermediaries, namely electronic mall, shopping agents, specialty auctions, portals, electronic auctions and electronic markets.
Shared Infrastructure	In this atomic business model a firm provides infrastructure shared by its owners. The shared infrastructure generally offers a service that is not already available in the marketplace, and it may also be a defensive move to thwart potential domination by another major player.
Value net Integrator	The value net integrator coordinates product flows from suppliers to allies and customers. He strives to own the customer relationship with the other participants in the model, thus knowing more about their operations than any other player. His main role is coordinating the value chain.
Virtual Community	In this model the firm is in the center, positioned between members of the community and suppliers. Fundamental to the success of this model is that members are able to communicate with each other directly.
Whole-of-Enterprise/Government	The single point of contact for the e-business customer is the essence of the whole-of-enterprise atomic business model. This model plays an important

	role in public-sector organizations but also applies to the private sector.

Table 6: Weill and Vitale's (2001) atomic business models

For Rappa (2001) a business model spells-out how a company makes money by specifying where it is positioned in the value chain. His classification scheme consists of nine generic forms of e-business models, which are Brokerage, Advertising, Infomediary, Merchant, Manufacturer, Affiliate, Community, Subscription and Utility (see Table 7). These generic models essentially classify companies among the nature of their value proposition or their mode of generating revenues (e.g. advertising, subscription or utility model).

Type of Model	Subcategories	Description
Brokerage Model	Marketplace Exchange, Business Trading Community, Buy/ Sell Fulfilment, Demand Collection System, Auction Broker, Transaction Broker, Bounty Broker, Distributor, Search Agent, Virtual Mall	They bring buyers and sellers together and facilitate transactions. Usually, a broker charges a fee or commission for each transaction it enables.
Advertising Model	Portal, Personalised Portal, Niche Portal, Classifieds, Registered Users, Query-based Paid Placement, Contextual Advertising	The broadcaster, in this case a web site, provides content (usually for free) and services (like email, chat, forums) mixed with advertising messages in the form of banner ads. The banner ads may be the major or sole source of revenue for the broadcaster. The broadcaster may be a content creator or a distributor of content created elsewhere.
Infomediary Model	Advertising Networks, Audience Measurement Services, Incentive Marketing, Metamediary	Some firms function as infomediaries (information intermediaries) by either collecting data about consumers or collecting data about producers and their products.
Merchant Model	Virtual Merchant, Catalog Merchant, Click and Mortar, Bit Vendor	Wholesalers and retailers of goods and services.
Manufacturer Model	Brand Integrated Content	Manufacturers can reach buyers directly and thereby compress the distribution channel.
Affiliate Model		The affiliate model provides purchase opportunities wherever people may be surfing. It does this by offering financial incentives (in the form of a percentage of revenue) to affiliated partner sites. The affiliates provide purchase-point click-through to the merchant via their web sites.
Community Model	Voluntary Contributor Model, Knowledge Networks	The community model is based on user loyalty. Users have a high investment in time and emotion in the site. In some cases, users are regular contributors of content and/or money.
Subscription Model	Content Services, Person-to-Person Networking Services, Trust Services, Internet Service Providers	Users are charged a periodic – daily, monthly or annual – fee to subscribe to a service.
Utility Model		The utility model is based on metering usage, or a pay as you go approach. Unlike subscriber services, metered services are based on actual usage rates

Table 7: Rappa's (Rappa 2001) classification scheme

Applegate (Applegate 2001) identifies four categories for digital business models, for which she gives a number of examples (see Table 8).

Business Model Category	Business Models
Focused Distributor Models	Retailer, Marketplace, Aggregator, Infomediary, Exchange
Portal Models	Horizontal Portals, Vertical Portals, Affinity Portals
Producer Models	Manufacturer, Service Provider, Educator, Advisor, Information and news services, Custom Supplier
Infrastructure Provider Models	Infrastructure portals

Table 8: Applegate's taxonomy of business models

3.1.3 Business Model Components

While defining what business models actually are has brought some order into the confusion, many authors have gone further to define of what elements business models are composed of. This is the first step to making business models a tool for business planning that help managers understand and describe the business logic of their firm. In this section I outline these attempts to define the business components, also referred to as "elements", "building blocks", "functions" or "attributes" of business models. I classify this literature among two main aspects, which are, on the one hand product, business actor- and network-centric literature and on the other hand marketing-centric literature. The authors of the second category most often cover both aspects mentioned above.

However, it must be said that the different approaches and business model component descriptions vary greatly regarding their depth and rigor, ranging from simple enumerations to detailed descriptions. Some of these concepts are highly abstract and very precise and some are merely lists of relatively low conceptual contribution. In this section I simply list and describe the business model elements of the authors that mention business model components. It is only in section 3.1.5 that I will dig deeper into some of the more formal modeling approaches.

3.1.3.1 Product-, Actor- and Network-Centric Business Model Frameworks

Mahadevan (2000) indicates that a business model consists of a configuration of three streams that are critical to the business. Firstly, the value stream, which identifies the value proposition for the business partners and the buyers. Secondly, the revenue stream, which is a plan for assuring revenue generation for the business. Thirdly, the logistical stream, which addresses various issues related to the design of the supply chain for the business.

Afuah and Tucci (2003) in contrast explain that a business model should include answers to a number of questions: What value to offer customers, which customers to provide the value to, how to price the value, who to charge for it, what strategies to undertake in providing the value, how to provide that value, and how to sustain any advantage from providing the value. The business model approach they outline is value-centered and takes in account the creation of value through several actors. In their conception of a business model one can find a list of business model components presented in Table 9.

Component	Questions for all business models
Customer Value	The firm must ask itself if it is offering its customers something distinctive or at a lower cost than its competitors
Scope	A company must define to what customers it is offering value and what range of products and services embody this value
Pricing	Pricing is about how a firm prices the value it offers
Revenue Source	A firm must ask itself where the income comes from and who will pay for what value and when. It must also define margins in each market and find out what drives them.
Connected Activities	The connected activities lay out what set of activities the firm has to perform to offer its value and when. It explains how activities are connected.

Implementation	A company has to ask itself what organizational structure, systems, people, and environment suit the connected activities best. It must define the fit between them.
Capabilities	A firm has to find out what its capabilities are and which capability gaps it has to fill. It should ask itself if there is something distinctive about these capabilities that allow the firm to offer the value better than other firms and that makes them difficult to imitate.
Sustainability	A company should understand what it is about the firm that makes it difficult for other firms to imitate. It must define how it can keep making money and sustain a competitive advantage.

Table 9: Afuah and Tucci's elements of a business model (2003)

In line with Timmers' business mode description above (1998), Stähler (2001; 2002) has a network-centric approach to business models and also excludes the marketing model from his business model framework. For him a business model consists of four components as summarized in Table 10. Firstly, a business model contains a description of what value a customer or partner (e.g. a supplier) receives from the business. Stähler calls this the value proposition. It answers the question of what value the business creates for its stakeholders. Secondly, he introduces a link between the firm and the customer, which is the product. Thus, a business model contains a description of the product or services the firm is providing the market. It answers the question of what the firm sells. Thirdly, a business model contains the description of the architecture of value creation. The value architecture delineates the value chain, the economic agents that participate in the value creation and their roles. The value architecture answers the question of how the value is created and in what configuration. Finally, a business model describes the basis and the sources of income for the firm. The value and the sustainability of the business are being determined by its revenue model. This component answers the question of how a company earns money.

BM component	Questions to ask
Value Proposition	What value does the company create for customers and partners?
Product/Services	What does the firm sell?
Architecture	How and through what configuration is value created?
Revenue Model	How does the company earn money?

Table 10: Stähler's business model components (based on (Stähler 2001; Stähler 2002)

Similar to Stähler (2001) and also based on Timmers (1998), Papakiriakopoulos and Poulymenakou (2001) propose a network-centric business model framework that focuses on actors and relationships. Their model consists of four main components, namely coordination issues, collective competition, customer value and core competences. The first component aims at defining the management of dependencies among activities. For example the sharing of an information resource among several actors requires coordination mechanisms that affect the structure of the organization. The second component, collective competition, describes the relationship to other companies, which can be competitive, co-operator, or both at the same time. This construct resembles the concept of co-opetition described by Brandenburger and Nalebuff (1996). The third component, customer value, aligns the business model with the market and customer needs. Finally, the core competencies define how a firm exploits its resources facing the opportunities of the market.

Maitland and Van de Kar (2002) apply a business model concept to a number of case studies in the mobile information and entertainment services. They describe the value proposition, the market segment, the companies involved and the revenue model of different innovative companies in the mobile telecommunications service industry.

Chesbrough and Rosenbloom (2000) simply list six main functions of a business model. These are the

articulation of the value proposition, the identification of the market segment, the definition of the structure of the value chain within the firm, the definition of the cost structure and profit potential, the description of the position of the firm within the value network, including identification of complementors and competitors and finally the formulation of the competitive strategy.

Unlike most other authors on business model components Alt and Zimmermann (2001) include elements such as mission, processes, legal issues and technology into their framework. The six generic elements they mention are outlined in Table 11.

BM element	description
Mission	A critical part of the business model is developing a high-level understanding of the overall vision, strategic goals and the value proposition including the basic product or service features.
Structure	Structure determines the roles of the different agents involved and the focus on industry, customers and products.
Processes	Processes provide a more detailed view on the mission and the structure of the business model. It shows the elements of the value creation process.
Revenues	Revenues are the "bottom line" of a business model.
Legal issues	Legal issues influence all aspects of the business model and the general vision
Technology	Technology is an enabler and a constraint for IT-based business models. Also, technological change has an impact on the business model design.

Table 11: Alt and Zimmermann's (2001) business model elements

3.1.3.2 Marketing-Specific Frameworks

Authors presented in this section include marketing specific issues into their business model frameworks. A very interesting business model proposition has been developed by Hamel (2000). For him a business model is simply a business concept that has been put into practice, but for which he develops a number of elements. He identifies four main business model components that range from core strategy, strategic resources over value network to customer interface. These components are related to each other through three “bridges” and are decomposed into different sub-elements. The main contribution of this concept illustrated in Figure 16 and Table 12 is a view of the overall picture of a firm.

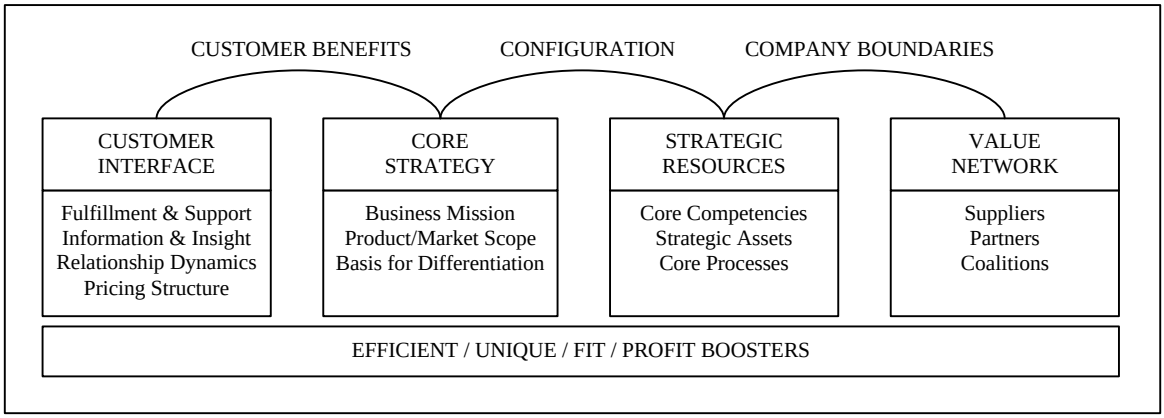


Figure 16: Hamel’s (2000) business model concept

	Name	Description
Elements	Core Strategy	This element defines the overall business mission, which captures what the business model is designed to accomplish. Further, it defines the product and market scope and specifies in what segments the company competes. Finally, it outlines how the firm competes differently than its competitors.
	Strategic Resources	This element contains the core competencies of a firm. In other words, what a firm knows, its skills and unique capabilities. Then it specifies the strategic assets, such as infrastructure, brands and patents. Last, this element outlines the core processes of the firm; it explains what people actually do.
	Customer Interface	This element is composed of fulfillment and support, which refers to the way the firm goes to market and reaches its customers (e.g. channels). Second, information and insight defines all the knowledge that is collected from and used on behalf of the customer. Third, the relationship dynamics refer to the nature of the interaction between the producer and the customer. Finally, the pricing structure explains what you charge the customer for and how you do this.
	Value Network	The value network outlines the network that surrounds the firm and complements and amplifies the firm's resources. It is composed of suppliers, partners and coalitions. Partners typically supply critical complements to a final product or solution, whereas coalitions represent alliances with like-minded competitors.
Connections	Configuration	This connection refers to the unique way in which competencies, assets, and processes are combined and interrelated in support of a particular strategy.
	Customer Benefits	This link intermediates between the core strategy and the customer interface. It defines the particular bundle of benefits that is actually being offered to the customer.
	Company Boundaries	This bridge refers to the decisions that have been made about what the firm does and what it contracts out the value network.

Table 12: Hamel's (2000) business model components

Like Hamel (2000), Linder and Cantrell (2000) propose a comprehensive approach to business models. Further, they stress the fact that many people speak of business models when they actually only mean a specific component of a business model. They list the following components: the pricing model, the revenue model, the channel model, the commerce process model, the Internet-enabled commerce relationship, the organizational form and the value proposition (see Figure 17).

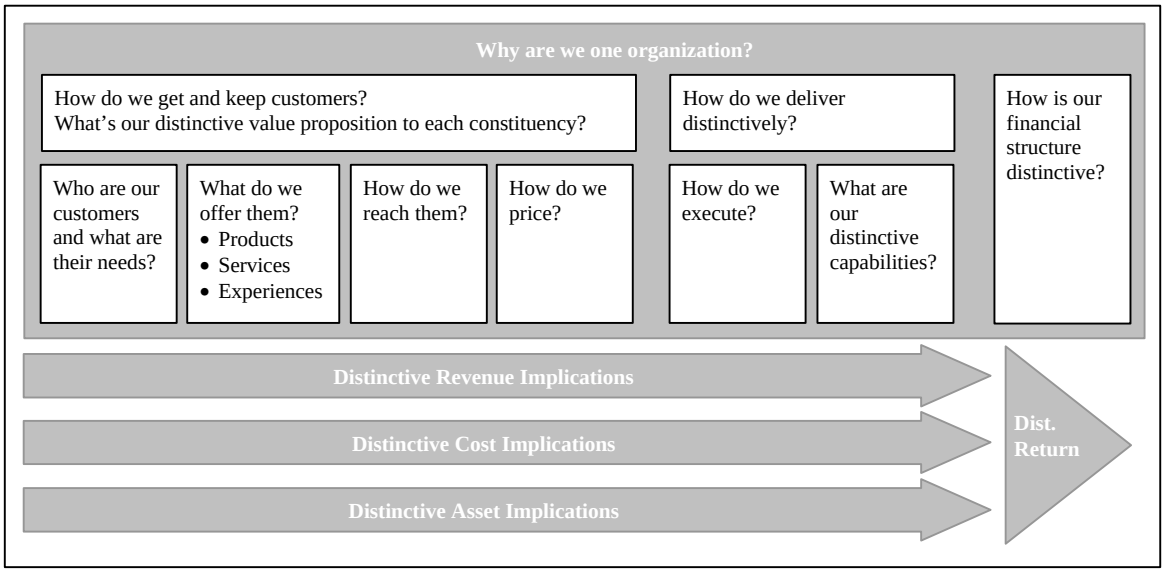


Figure 17: Linder and Cantrell's (2000) business model concept

Weill and Vitale (2001) have a slightly different approach, they give a systematic and practical analysis of eight so called atomic e-business models as describe in Table 6. These atomic business models can be combined to form an e-business initiative. Every one of these atomic e-business models is analyzed according to its strategic objectives and value proposition, its sources of revenue, its critical success factors and its core competencies. In addition the authors also outline the elements to analyze an e-business initiative which are a business model's channels, customer segments and IT-Infrastructure.

BM Element		Description
Business model summary	Strategic Objective and Value Proposition	Gives an overall view of the target customer, the product and service offering and the unique and valuable position targeted by the firm. It defines what choices and trad-offs the firm will make.
	Sources of Revenue	A realistic view of the sources of revenue is a fundamental question for e-business models.
	Critical Success Factors	These are things a firm must do well to flourish. There are a set of general critical success factors for every atomic business model.
	Core Competencies	These are the competencies necessary that should be created, nurtured, and developed in-house and contribute to the power of a business model.
Elements of an e-business initiative	Customer Segments	According to Weill and Vitale an e-business initiative should always start with the customer. This means understanding which customer segments are targeted and what the value proposition is for each segment.
	Channels	A channel is the conduit by which a firm's products or services are offered or distributed to the customer. Reaching target customer segments requires careful channel selection and management. Interestingly the authors add that in e-business the channel should be considered a feature of the product offer and thus part of the value proposition.
	IT Infrastructre	The IT infrastructure is used in to connect the different parts of the firm and link to suppliers, customers, and allies.

Table 13: Weill and Vitale's business model and e-business initiative elements (2001)

The business model approach by Petrovic, Kittl et al. (Petrovic, Kittl et al. 2001) suggests that a business model can be divided into seven sub-models, which are the value model, the resource model, the production model, the customer relations model, the revenue model, the capital model and the

market model. These sub-models and their interrelation shall describe the logic of a business system for creating value that lies behind the actual processes. The value model describes the logic of what core products, services and experiences are delivered to the customer and other value-added services derived from the core competence. The revenue model describes the logic of how elements are necessary for the transformation process, and how to identify and procure the required quantities. The production model describes the logic of how elements are combined in the transformation process from the source to the output. The customer relations model scribes the logic of how to reach, serve, and maintain customers. It consists of the following sub-models: a distribution model – the logic behind the delivery processes, a marketing model – the logic behind reaching and maintaining customers and a service model – the logic behind serving the customer. The revenue model describes the logic of what, when, why, and how the company receives compensation in return for the products. The capital model describes the logic of how financial sourcing occurs to create a debt and equity structure, and how that money is utilised with respect to assets and liabilities over time. The market model describes the logic of choosing a relevant environment in which the business operates.

Compared to the previous authors Magretta (2002) has a very simple and pragmatic view on business models. She distinguishes between two elementary parts of a business model. On the one hand the business activities associated with making something (e.g. design, procurement, and manufacturing) and on the other hand the business activities associated with selling something (e.g. customer identification, selling, transaction handling, distribution and delivery).

3.1.4 Representation Tools

In addition to outlining the components of a business model, some authors offer a set of business model representation tools. Weill and Vitale (2001) have developed a formalism to assist analyzing e-business initiatives, which they call e-business model schematic. The schematic is a pictorial representation, aiming to high-light a business model's important elements. This includes the firm of interest, its suppliers and allies, the major flows of product, information and money and finally the revenues and other benefits each participant receives. By using such a representation the authors intend to uncover major contradictions of a business model, highlight the core competencies to implement the model, show the position of each player in the industry value chain, deduce the organizational form and IT infrastructure for implementation and reveal which entity owns the customer relationship, data, and transaction.

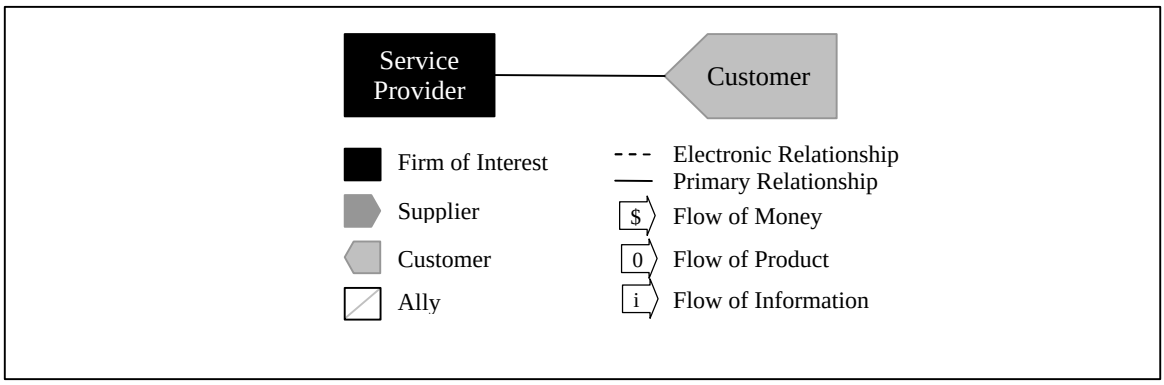


Figure 18: business model schematic of the direct to customer model and (Weill and Vitale 2001)

The design approach of Gordijn (2002), which among other things aims at visualizing business models is outlined in the following section.

3.1.5 Ontological Modelling

Whereas the business model frameworks presented until here stay relatively informal and descriptive this section treats of ontology-style models. Under ontological modelling I understand a rigorous approach to defining business models. In other terms this means carefully and precisely defining business model terms, concepts, components and their relationships. From the authors analyzed in this literature review Gordijn (2002) provides the most rigorous conceptual modeling approach, which he

calls e3-value™. This methodology is based on a generic value-oriented ontology specifying what's in an e-business model. On the one hand it has the goal of improving communication and decision making related to e-business and on the other hand it aims at enhancing and sharpening the understanding of e-business operations and requirements through scenario analysis and quantification (cf. 3.1.5). e3-value consists of a number of generic concepts and relationships illustrated in Figure 19. Gordijn specifies actors that produce, distribute or consume objects of value by performing value activities. The objects of value are exchanged via value interfaces of actors or activities. Value interfaces have value ports offering or requesting objects of value. The trade of value objects is represented by value exchanges, which interconnect value ports of actors or value interfaces.

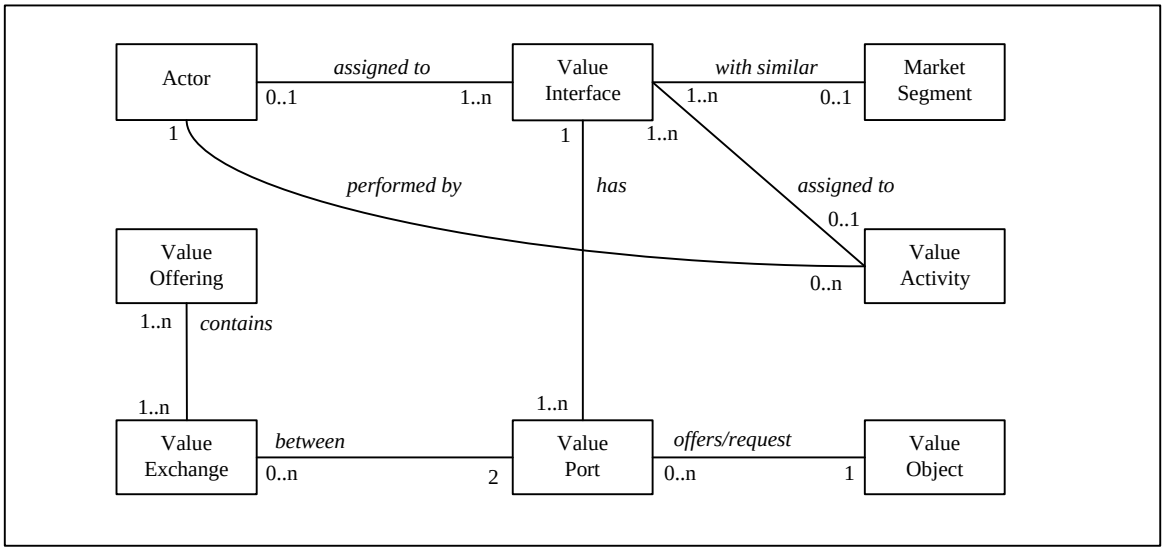


Figure 19: e3-value ontology for e-business (Gordijn, Akkermans et al. 2001)

The e3-value methodology has been applied to a real world business case and evaluated one-year-and-a-half later (Gordijn and Akkermans 2003). Lessons learned include that the method is lacking a marketing perspective, that business units should be included in the analysis and that it would be helpful to work with evolutionary scenarios. However, Gordijn and Akkermans are positive about their methodology enhancing the common understanding of business ideas, which was not possible by traditional e.g. verbal ways. Furthermore, they believe that a model-based approach to business problems can help asses the consequences of changes in business models.

3.1.6 Business Models and Change

Because models are static by nature and simply take a snapshot of a current situation, a number of authors add a time trajectory to business models and introduce the concept of change. This allows them to go from a current state or business model to a desired state or new business model. Linder and Cantrell (2000), for example, mention that business models are a picture at a point in time, but that most firm's business models are under constant pressure to change because of numerous pressures in the firm's environment (e.g. technology, law and competition)(cf. also 2.3). Therefore and in order to coordinate and channel change inside a company they introduce so-called change models. They distinguish four basic types according to their degree to which they change the core logic of a company, namely realization models, renewal models, extension models and journey models (see Figure 20). The realization model focuses on small changes in the existing business model of a firm in order to maximize its potential. It often involves preoccupations, such as brand maintenance, product line extensions, geographic expansions or additional sales channels. Renewal models are characterized by consistent revitalization of product and service platforms, brands, cost structures and technology bases. According to Linder and Cantrell a renewing firm leverages its core skills to create new positions on the price/value curve. This kind of change model also often involves attacking untouched markets and introducing new retailing formats. Extension models expand businesses to cover new ground. An extending company stretches its operating model to include new markets, value chain functions, and product and service lines. This kind of model often involves forward, backward and

horizontal integration in the value chain. Finally, journey models provoke most change and take a company to a complete new business model.

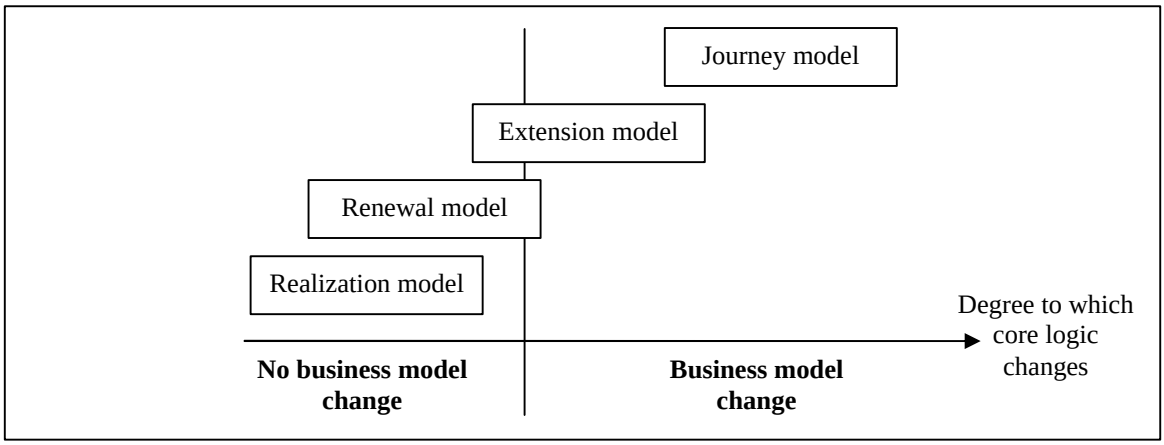


Figure 20: Change Models (Linder and Cantrell 2000)

Tapscott, Ticoll et al. (2000) propose a change methodology in six steps towards creating a b-web company (cf. Figure 15 and Table 4). The first step consists of describing the current value proposition by defining end-customers, offerings, customer value and the value proposition's strengths and weaknesses from a customer's perspective. The second step consists of disaggregating and identifying the entities that contribute to the total value-creation system. The following step envisions b-web enable value. In other words, planners must step outside their day-to-day mental models to develop creative and discontinuous views of doing business. This means asking what new business models – ways of creating, setting, and delivering value and facilitating relationships with customers, suppliers, and partners – could be envisaged. In the fourth step the company must reaggregate. This step entails repopulating the categories of value contributors and assigning contributions to the various classes of participants. The fifth step consists of preparing a value map, which is a graphical depiction of how a b-web operates. It identifies the participants, such as strategic partners, suppliers and customers and their exchanges of value. The last step consists of doing the b-web mix, which means considering how each type and subtype might enhance customer value, provide competitive differentiation and advantage and reduce costs for the participants.

In his e^3-value methodology Gordijn (2002) outlines a change methodology based on value model deconstruction and reconstruction, which is mainly inspired by Tapscott, Ticoll et al. (2000) Evans and Wurster (2000) and Timmers (1999). He splits the process into two questions, namely, which value adding activities exist, and which actors are willing to perform these activities.

Petrovic, Kittl et al. (2001) specify that the improvement and change of a real world business model is related to the ability to change a manager's mental model. According to them, people often talk about reducing time and costs via automating or redesigning processes when really they want to improve their business model. To change this Petrovic, Kittl et al. introduce double-loop learning to explicit mental models through a systemic business model concept in order to provide a holistic, broad, long-term and dynamic view to help redesign business models.

Papakiriakopoulos and Poulymenakou (2001) propose a transformation method for constructing e-business models based on their analytical framework outlined in section 3.1.3.1. The method includes 4 steps, ranging from the identification of players, over highlighting the value flows and identifying key competitive drivers to constructing a feedback chain. Thus, the first step consists of defining the context and the scope of the business model. This means identifying the list of stakeholders and describing their strategy. The second step consists of drawing the relationships and flows between the actors in order to capture the value chain concepts. Papakiriakopoulos and Poulymenakou recognize two main flows, which are the financial flows and the communication flows. The next step of this methodology is about identifying the nature of competition in the marketplace. The fourth and final step of the method aims at constructing a so called "feedback chain". The objective of the feedback chain is to examine and collect all the information resources that could help and empower some

processes that are placed on the value chain. The authors have applied this method to a case in the media industry that broadcasts advertisements in the form of video and/or interactive content and wants to measure efficiency in order to offer personalized information through a TV set-top box in the consumer's household. Papakiriakopoulos and Poulymenakou found that the framework and methodology helped highlighting several issues corresponding to the four elements of their model, namely coordination, customer value, competition and core competencies.

3.1.7 Business Model Evaluation and Indicators

A last, but nevertheless very important and challenging field of business model research concerns the definition of indicators, business model measurement and evaluation. A number of authors have written on this question, attacking the problem from different angels (Hamel 2000; Gordijn 2002; Afuah and Tucci 2003).

Hamel (2000), for example, talks of the wealth potential of a business model that covers four factors. Firstly, it questions to which extent the business concept is an efficient way of delivering customer benefits. Secondly, it covers the extent to which the business concept is unique. Differentiation is of immense importance because the more similar business models, the less probable are chances for above-average profits. Thirdly, it analyzes the degree of fit among the elements of the business concept. Finally, it questions the extent to which the business concept exploits profit boosters that have the potential to generate above-average returns. Under profit boosters Hamel understands increasing returns, competitor lock-out, strategic economies and strategic flexibility.

Afuah and Tucci (2003) appraise business models on three levels. Namely profitability measures, profitability predictor measures and business model component attribute measures. The first level embraces earnings and cash flows, two frequently used indicators by analysts. If a firm's earnings or cash flows are better than those of competitors, this would mean that it has a competitive advantage. The second level comprises profit margins, revenue market share and revenue growth. Again, a firm has a competitive advantage if these measures indicate a better performance than competitors. The third and capital level provides benchmark questions for each of Afuah and Tucci's business model components (cf. section 3.1.3.1. and see Table 14).

Component of Business Model	Benchmark Questions
Customer Value	Is customer value distinct from that competitors? If not, ist the firm's level of value higher than that of competitors? Is the firm's rate of increase in customer value high relative to that of competitors?
Scope	Is the growth rate of market segments high? Is the firm's market share in each segment high relative to that of competitors'? Is potential erosion of products high? If so, in what segments?
Pricing	Is the quality-adjusted price low?
Revenue Source	Are margins and market share in each revenue source high? Are margins and market share in each revenue source increasing? Is the firm's value in each source of revenue distinctive? If not, is the level of value higher than that of competitors?
Connected Activities	What is the extent to which activities: Are consistent with customer value and scope? Reinforce each other? Take advantage of industry success drivers? Are consistent with the firm's distinctive capabilities? Make the industry more attractive for the firm?

Implementation	Is the quality of the team high?
Capabilities	To what extent are the firm's capabilities: Distinctive? Inimitable? Extendable to other product markets?
Sustainability	Has the firm been able to maintain or extend its lead in its industry?

Table 14: Appraising a Business Model: Component Measures (Afuah and Tucci 2003)

The probably most advanced proposition for evaluating business models is outlined by Gordijn (2002) and is part of their e^3-value method. They propose studying the economic feasibility of an e-business idea in quantitative terms by creating a profit sheet and assessing the value of objects for all actors involved. This is possible because their method is highly actor-, network- and value-centered and focuses and the value exchanges among business model participants (cf. 3.1.5). The authors admit that this evaluation serves for building confidence in an e-business idea rather than calculating precise profit estimations, which would be unrealistic. Further, Gordijn introduces an additional confidence-building step through the elaboration of “whati-if” scenarios. This helps stakeholders understand the sensitivity of e-business models with respect to its parameters, such as financials, future trends or customer behavior.

3.2 ONTOLOGIES

The second field of research that has influenced this dissertation is ontologies, particularly in IS. I outline some of the existing work in the following lines.

The term Ontology (with a capital "O") has its origin in philosophy and denotes the philosophical discipline that deals with the nature and the organization of reality, contrary to Epistemology, which deals with the nature and sources of our knowledge (Guarino and Giaretta 1995). In this thesis I use the term ontology (with the lowercase "o") to which I refer to with Gruber's (1993) definition as an explicit specification of a conceptualization. And I refer to a conceptualization as an intentional semantic structure which encodes the implicit rules constraining the structure of a piece of reality (Guarino and Giaretta 1995).

In order to clarify what an ontology is Ushold and Gruninger (1996) refer to a quote from the SRKB (Shared Re-usable Knowledge Bases) electronic mailing list that nicely summarizes its signification and the various forms and contexts it arises in.

> "Ontologies are agreements about shared conceptualizations. Shared conceptualizations include conceptual frameworks for modeling domain knowledge; content-specific protocols for communication among inter-operating agents; and agreements about the representation of particular domain theories. In the knowledge sharing context, ontologies are specified in the form of definitions of representational vocabulary. A very simple case would be a type hierarchy, specifying classes and their subsumption relationships. Relational database schemata also serve as ontologies by specifying the relations that can exist in some shared database and the integrity constraints that must hold for them."

After emerging in the artificial intelligence community and being applied to knowledge engineering ontologies are increasingly used in IS and IT. The main goal of applying ontologies in IS is the development and implementation of an explicit account of a shared understanding in a given subject area in order to solve a problem (Ushold and Gruninger 1996). Furthermore, Moschella (2002, p.25) describes IT ontologies as "logical supersets that combine metadata, taxonomies and semantics into formal systems that can be encoded in software, enabling diverse Web applications to truly understand one another". He also indicates that after the IT industry standardization efforts have focused on hardware, software and communication technologies the frontier is constantly shifting towards information itself. Moschella (2002, p.25) believes this will "require the systematic management of business terms and their usage". The main set of problems this shift addresses can be found in a text by

Ushold and Gruninger (1996):

- poor communication within and between people and their organization.
- difficulties in identifying the requirements and the specification of IT systems.
- poor inter-operability.
- poor use of potential re-use and sharing.
- as a consequence of the above much effort is wasted in re-inventing the wheel.

Concretely, the effort to define ontologies in business has taken two different forms. Firstly, there are those ontologies that belong in the category of the so-called enterprise ontologies that describe the concepts related to the nature and structure of the business enterprise. Secondly, there are the transaction related ontologies, essentially used in e-business and aimed at specifying information in electronic business transactions in order to improve and automate these transactions (Fensel 2001). For the purpose of this thesis we will shortly survey the efforts in the former category. These are enterprise models with the goal of being a computational representation of the structure, activities, processes, information, resources, people, behavior, goals and constraints of a business, government, or other enterprise (Fox and Grüninger 1997).

3.2.1 Business Engineering Model (BEM)

This model represents a set of formalisms to specify the core metadata found in the operational and data warehousing environment of enterprises, in order to support interoperability among them (Bertolazzi, Krusich et al. 2001). The concepts are described in UML. The model captures information on business goals, the organization, the business processes and business rules.

3.2.2 The Edinburgh Enterprise Ontology

The work of the Edinburgh Group is aimed at proposing an enterprise ontology (Ushold, King et al. 1997), i.e. a set of carefully defined concepts that are widely used for describing enterprises in general and that can serve as a stable basis for specifying software requirements (Bertolazzi, Krusich et al. 2001). The group has developed tools for modeling enterprises and processes. The Enterprise Ontology is proposed as a way to communicate, integrate and represent in a unique way the various aspects of an enterprise. The Enterprise Ontology is represented in an informal way (text version) and in a semi-formal way (Ontolingua). The ontology first presents natural language definitions for all the terms, starting with the foundational concepts, such as entity, relationship and actors (i.e. the meta-ontology). These are then used to define the main body of terms, which are divided into four subject areas (Ushold, King et al. 1997), namely:

- Activities
- Organization
- Strategy
- Marketing

3.2.3 The Toronto Virtual Enterprise (TOVE)

The Toronto Virtual Enterprise aims at delivering a model that supports model-driven enterprise design, analysis and operation (Fox and Gruninger 1998). This project has formally defined a set of concepts that are general enough to allow their use in different applications. The concepts, similarly to the Enterprise Ontology, are grouped into thematic sections. For each concept, properties and relations are defined. However, unlike the semi-formal Enterprise Ontology, the Toronto Virtual Enterprise is rigorously formal. In other words, it has meticulously defined terms with formal semantics, theorems and proofs of such properties as soundness and completeness (Ushold and Gruninger 1996). Basically, the generic, reusable enterprise data model has the following characteristics (TOVE 2002). It:

- provides a shared terminology for the enterprise that each agent can jointly understand and use,

- defines the meaning of each term (i.e. semantics) in a precise and as unambiguous manner as possible,
- implements the semantics in a set of axioms that will enable Toronto Virtual Enterprise to automatically deduce the answer to many "common sense" questions about the enterprise, and
- defines a symbology for depicting a term or the concept constructed thereof in a graphical context.

3.2.4 Enterprise Ontologies versus Business Model Ontology

In this dissertation I pick up the idea of building a business ontology aiming at improving understanding, communication and flexibility just as do the Enterprise Ontology and the Toronto Virtual Enterprise. But while these overall objectives might seem quite similar, the domain and content of the ontology delivered in the following chapters of this dissertation is substantially different. While the Enterprise Ontology and the Toronto Virtual Enterprise focus essentially on structural aspects of business I aim at formalizing business concepts in the business model domain. My goal is to provide a semi-formal ontology for business models by following Ushold and Gruninger's (1996) guidelines for building an ontology:

- Capturing & coding the ontology: Identify the key concepts and relationships in the domain of interest and produce unambiguous text definitions of them.
- Evaluating the ontology: Test the internal and external consistency of the ontology.
- Documenting the ontology: Meticulously document the provided ontology.

4 THE BUSINESS MODEL ONTOLOGY

4.1 INTRODUCING THE ONTOLOGY

4.1.1 The Nine Building Blocks

As explained in several previous sections of this dissertation the main goal of this research is to provide an ontology that allows to accurately describe the business model of a firm. In order to achieve this I have, in a first step, identified four main areas that constitute the essential business model issues of a company. In a second step I have broken these areas down into a set of nine interrelated building blocks that allow to conceive a business model.

Influenced by the Balanced Scorecard approach (Kaplan and Norton 1992) and more generally business management literature (Markides 1999) I suggest adopting a framework which emphasizes on the following four areas that a business model has to address:

- PRODUCT: What business the company is in, the products and the value propositions offered to the market.
- CUSTOMER INTERFACE: Who the company's target customers are, how it delivers them products and services, and how it builds a strong relationships with them.
- INFRASTRUCTURE MANAGEMENT: How the company efficiently performs infrastructural or logistical issues, with whom, and as what kind of network enterprise.
- FINANCIAL ASPECTS: What is the revenue model, the cost structure and the business model’s sustainability.

These four areas can be compared to the four perspectives of Norton and Kaplan's Balanced Scorecard approach (Kaplan and Norton 1992). The Balanced Scorecard is a management concept developed in the early 90s that helps managers measure and monitor indicators other than purely financial ones. The authors compare their now quite well known tool to an airplane cockpit where the pilot flies the plane by reacting to the information they get from their board tools. Evidently this information has to cover all relevant aspects of flying a plane. The same applies to companies where managers have to monitor the essential areas of a business in order to lead it. Norton and Kaplan identify four perspectives of the firm on which executives must keep an eye to conduct successful business. In the customer perspective the company asks itself how it is seen by its customers. In the Internal perspective the company reflects on what it must excel at. In the innovation and learning perspective the company analyzes how it can continue to improve and create value. Finally, in the financial perspective a company asks itself how it looks to shareholders. These perspectives seem quite adequate as a starting point for a business model ontology, all the more since Norton and Kaplan propose that they can serve for mapping strategy in some of their later work (Kaplan and Norton 2000).

Markides (Markides 1999) follows a similar path by providing a very simple recipe to business strategy. He recommends looking at the "who" the "what" and the "how" of a business. This means the first question executives must ask themselves is who they should target as customers. The second question is about what products or services a company should offer. The last question is about how these services can be delivered best to customers. These three intuitive trajectories are comparable to the perspectives mentioned above if one adds the financial aspect to Markides' recipe. In Table 15 I show how the pillars of the ontology compare to Kaplan and Norton (2000) and to Markides (1999).

Business Model Ontology	Balanced Scorecard (Kaplan and Norton 1992)	Markides (Markides 1999)
Product	Innovation and Learning Perspective	What?
Customer Interface	Customer Perspective	Who?
Infrastructure Management	Internal Business Perspective	How?
Financial Aspects	Financial Perspective	

Table 15: The four business model pillars

But as I do not want to stay at this level of low granularity and description and want to move towards something more detailed and formal I split the four pillars of the business model ontology into nine interrelated business model building blocks, or simply business model elements. While the four areas are a rough categorization the nine elements are the core of the ontology. These elements, presented in Table 16, are a synthesis of the business model literature review described in section 3.1 and consist of value proposition, target customer, distribution channel, relationship, value configuration, capability, partnership, cost structure and revenue model.

Pillar	Building Block of Business Model	Description
Product	**Value Proposition**	A Value Proposition is an overall view of a company's bundle of products and services that are of value to the customer.
Customer Interface	**Target Customer**	The Target Customer is a segment of customers a company wants to offer value to.
	Distribution Channel	A Distribution Channel is a means of getting in touch with the customer.
	Relationship	The Relationship describes the kind of link a company establishes between itself and the customer.
Infrastructure Management	**Value Configuration**	The Value Configuration describes the arrangement of activities and resources that are necessary to create value for the customer.
	Capability	A capability is the ability to execute a repeatable pattern of actions that is necessary in order to create value for the customer.
	Partnership	A Partnership is a voluntarily initiated cooperative agreement between two or more companies in order to create value for the customer.
Financial Aspects	**Cost Structure**	The Cost Structure is the representation in money of all the means employed in the business model.
	Revenue Model	The Revenue Model describes the way a company makes money through a variety of revenue flows.

Table 16: The nine business model building blocks

Figure 21 gives the reader a first overview of the business model ontology and how the specific

elements relate to each other. The elements will be described in further detail in the following sections.

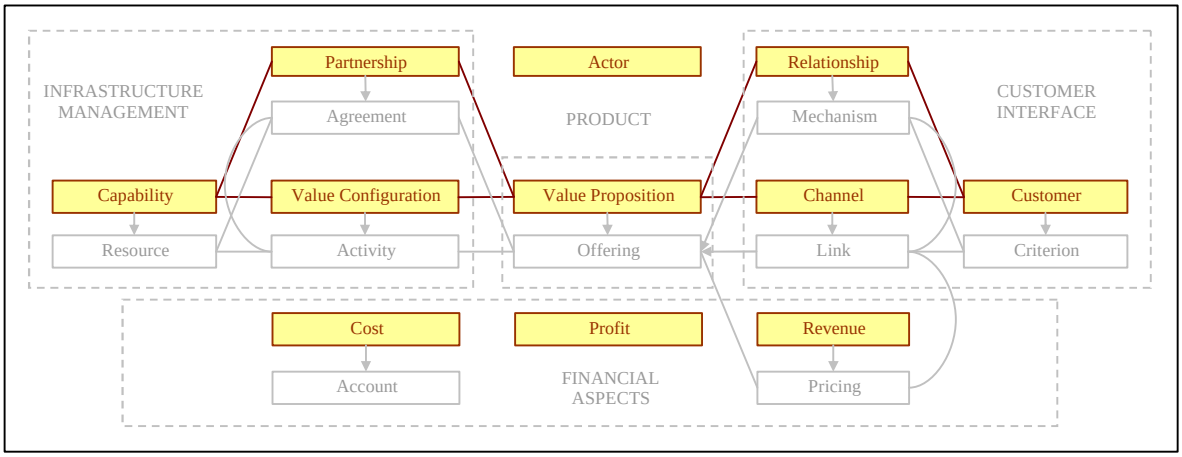


Figure 21: The Business Model Ontology

However, before coming to a detailed ontology description I show that the nine business model elements are based on a synthesis of the existing business model literature in Table 17 and Table 18. In other words, I have identified what business model building blocks have been proposed by the other authors in the field and constructed a new model taking their contributions into account. As explained in the literature review, some authors have simply mentioned their proposed elements, others have explained them and a last group has conceptualized them. The aim of this dissertation was to propose a business model integrating the existing work and going a step further by conceptualizing every singly element and then integrating them into a whole.

Basically, the nine elements of the ontology cover all the business model building blocks mentioned by at least two authors. Furthermore, I have excluded elements related to the competitive landscape and to implementation, which I understand as related to the business model but not as internal part of it. Table 17 and Table 18 name the elements proposed by the other authors and show how they relate to the ontology. Some authors have proposed elements not covered in the ontology. For example, Petrovic, Kittle et al. (2001) mention the *capital model* and the *market model* as a business model component. I believe these are, though important part of the business, exterior to the business model of the firm. Former is important to realize a business model (Chesbrough and Rosenbloom 2000) and latter is important to situate a business model in the competitive landscape (cf. section 2.3), but they are not part of the business model. Similarly, Afuah and Tucci (2003) mention the profit site, which is a company's location in a value configuration vis-à-vis its suppliers, customers, rivals, potential new entrants, complementors, and substitutes. In my approach I would rather see this element as a part of strategy, positioning the firm in the competitive landscape and designing the company's business model accordingly. Likewise, two authors mention elements related to business model implementation in their business model concept (Linder and Cantrell 2000; Afuah and Tucci 2003) that I do not conceive as internal to the business model but related to its execution.

Finally, in the evaluation section (see section 1) I will show how the ontology relates to the other authors in the domain in regard to modeling intensity of the different business model building blocks.

Business model ontology	Stähler 2001	Weill and Vitale 2001	Petrovic, Kittl et al.	Gordijn 2002	Afuah and Tucci 2003	Tapscott, Ticoll et al. 2000	Linder and Cantrell 2000
Value Proposition	Value Proposition	Value Proposition, strategic objective	Value Model	Value offering	Customer Value		value proposition
Target Customer		Customer Segments		Market Segment	Scope		
Distribution Channel		Channels	Customer relations model				channel model
Customer Interface			Customer relations model				commerce relationship
Value Configuration	Architecture		Production Model	e3-value configuration	connected activities, value configuration	b-webs	commerce process model
Capability		Core competencies, CSF	Resource Model		capabilities		
Partnership	Architecture	e-business schematics		Actors		b-webs	
Cost Structure				Value exchange	cost structure		
Revenue Model	Revenue Model	Source of revenue	Revenue Model	value exchange	pricing, revenue source		pricing model, revenue model

Table 17: Business Model Ontology compared to Literature Review (part 1)

Business model ontology	Hamel 2000	Mahadevan 2000	Chesbrough and Rosenbloom 2000	Magretta 2002	Amit and Zott 2001	Applegate and Collura 2001	Maitland and Van de Kar 2002
Value Proposition	Product/market scope	Value stream	Value proposition	What does the customer value?	Transaction component	Product and Services offered	Value proposition, assumed value
Target Customer	Market scope		Market segment	Who is the customer?		Market opportunity	Market segment
Distribution Channel	Fulfillment & support, info & insight			How can we deliver value at an appropriate cost?		Marketing/sales model	
Customer Interface	Relationship dynamics					Brand and reputation	
Value Configuration	Core processes	Logistical stream	Structure of the value chain		Architectural configuration	Operating model	
Capability	core competencies, strategic assets					(Organization and culture, management model)	
Partnership	suppliers, partners, coalitions		Position in the value chain		Transaction component	Partners	Companies involved in creating value
Cost Structure			Cost structure	What is the underlying economic vale?			
Revenue Model	pricing structure	Revenue stream		How do we make money in this business		Benefits to firm and stakeholders	Revenue Model

Table 18: Business Model Ontology compared to Literature Review (part 2)

4.1.2 Notation and Labeling of the Ontology Elements

The business model ontology is a set of elements and their relationships that aim at describing the money earning logic of a firm. As outlined above the ontology contains nine business model building blocks, so-called business model elements. The characteristics of each of them is described in the form of a table (cf. Table 19) and thereafter explained in more detail in the following pages. Every business model element can be decomposed into a set of defined sub-elements. This decomposition allows studying business models on different levels of granularity in more or less detail and according to specific needs.

Name of BM-Element	NAME
Definition	Gives a precise description of the business model element.
Part of	Defines to which pillar of the ontology the element belongs to or of which element it is a sub-element
Related to	Describes to which other elements of the ontology an element is related to.
Set of	Indicates into which sub-elements an element can be decomposed.
Cardinality	Defines the number of allowed occurrences of an element or sub-element inside the ontology.
Attributes	Lists the attributes of the element or sub-element. The allowed values of an attribute are indicated between accolades {VALUE1, VALUE2}. Their occurrences are indicated in brackets (e.g. 1-n). Each element and sub-element has two standard attributes which are NAME and DESCRIPTION that contain a chain of characters {abc}.
References	Indicates the main references related to the business model element.

Table 19: Description of a business model element

Every business model element is described precisely, textually and graphically (cf. Figure 22). In the graphical presentation the yellow boxes indicate the elements and sub-elements that are being discussed in a specific section. The grey boxes indicate the related elements.

As illustrated in the graphical descriptions and defined in the tables element and a sub-element are related to each other through a "setOf" and "isA" relationship. The former relationship indicates that an element can be decomposed into a finer level of granularity, whereas the latter indicates that there is a relationship of inheritance between element and sub-element.

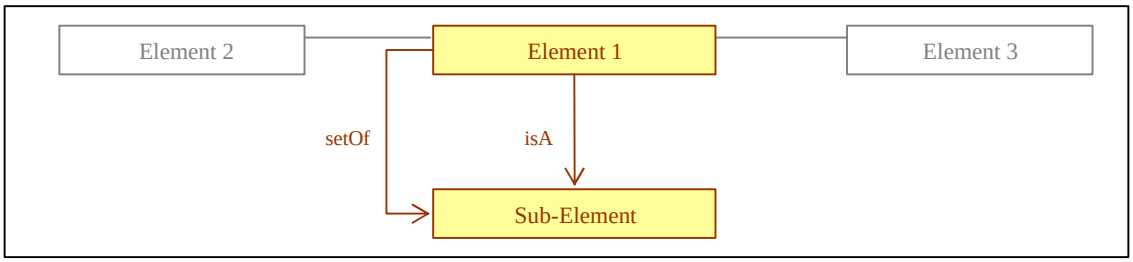


Figure 22: Graphical illustration of an element of the ontology

Furthermore, throughout the dissertation elements and sub-elements are formatted in capitals (e.g. VALUE PROPOSITION) and attributes in capitals in italic (e.g. *PRICE LEVEL*).

4.2 PRODUCT

Traditionally, companies concentrated on positioning themselves in the right place on the value chain, with the right products and market segments and the right value-added services. But through globalization, rapidly changing markets and new technologies things have become more complex and complicated. Companies increasingly organize in networks and offer bundles of products and services as a group. Today the art of creating and co-producing value with others is clearly at the centre of strategic tasks (Normann and Ramírez 1993). As shown previously this is essentially due to the falling costs of ICT and the increased connectivity of actors, which has opened up new possibilities for creating co-engineered information goods and services, new information-based value-added services or information-rich physical goods. Especially e-business value propositions tend to be complex and hard to communicate in an easy way.

The major impact of ICT on product innovation was the separation of information and physical goods (i.e. the physical carrier of information) and the resulting ease of distribution (cf. Illustration Box 3). Look at this following simple illustration. A book is made of content (which is an information good) and paper (which is its physical carrier). By separating information and carrier the book can be diffused through a variety of electronic or bricks-and-mortar channels. Imagine you were in a local book store and you were looking for something they do not have in stock. If the store had so-called print-on-demand facilities they could download the content and print out the book in a matter of minutes. A similar concept is very common in some music stores. Customers can chose song titles out of a large data base and get them burnt on a CD immediately. In fact, many people already download or buy music over the Internet directly to their homes. In more economic terms these examples meant that one is not limited to the economics of things anymore, but enters the "new economics of information" (Evans and Wurster 1997). This simply means that a company can easily reach a large number of customers and provide them with very rich information or added value in form of multimedia data, personalized information or customized products. One company that realized this very quickly was Federal Express. In 1994 it extended its value proposition by offering additional services on a newly launched Website. FedEx was the first to offer online package status tracking, which allowed each and every customers to follow their package during its delivery. While this has not profoundly changed the shipping industry, other sectors, such as the music and film industry risk to be completely transformed because their products can be entirely digitized. An example of the trembling fundaments of the music industry was the notorious fight of the major record companies against the file-trading platform called Napster (Rupp and Esthier 2003). This forced them to rethink their value proposition or even their entire business model (Durlacher 2001). In general, companies that are not able to constantly innovate risk to fall into the commoditization trap because successful products are rapidly copied by an ever more global competition. Of course innovation is no guarantee for success, but recent research shows that superior market performers are essentially companies that are able to innovate and constantly transform their value proposition (Kim and Mauborgne 1997; Chen and Kai-Ling Ho 2002). In the business model ontology this is expressed in product innovation, which is one of the main four pillars of a business model.

Digital Product Innovation at Audible

Audible is a company that sells spoken audio content, such as audio versions of books, magazines, newspapers or radio programs. As opposed to its more traditional competitors, Audible does not deliver its content in form of CDs or audio cassettes. It converts audio books and other spoken audio programs to digital files that can be delivered directly to the customer's PC over the internet and are enjoyed on the computer or on a range of hand-held electronic devices like Personal Digital Assistants (PDAs) or MP3 players. Through the unbundling of the information component and its physical carrier, Audible can offer a whole new value proposition that has redefined the industry it is competing in. Firstly, because it carries no physical inventory it can propose a browsable catalog of more than 5,800 digital audio books and more than 15,000 other audio selections on its audible.com Website. Secondly, delivery is instant and depends only on the customer's Internet bandwidth. Thirdly, because the audio content is delivered as a digital file it stays portable and can be burnt on a CD or transferred to a mobile audio player. And finally, audible.com is accessible from any PC with and Internet connection. The target customers the firm wants to address are essentially people that take their Audible programs to their workout at the gym, commute in their cars or the subway or simply want to turn their downtime into productive time. In order to deliver its value proposition the company has to have a number of capabilities at its disposal. Most importantly, it must be able to offer supreme content that its customers value. Furthermore it must excel in Information Technology (IT), in order to manage digital content, its Website and the digital delivery of audio files.

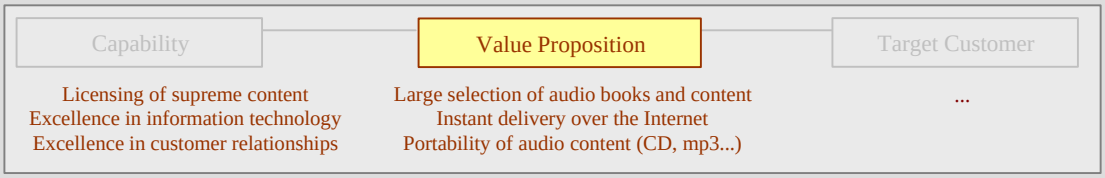


Illustration Box 3: Audible

Definition: PRODUCT covers all aspects of what a firm offers its customers. This comprises not only the company's bundles of products and services but the manner in which it differentiates itself from its competitors. PRODUCT is composed of the element VALUE PROPOSITION, which can be decomposed into its elementary OFFERING(s) (see Figure 23).

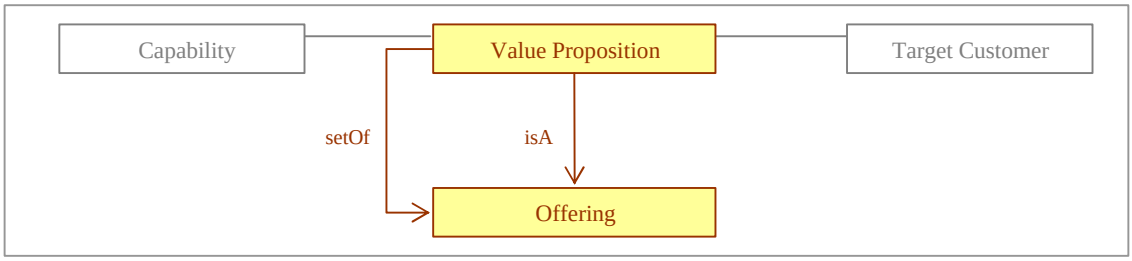


Figure 23: Product

4.2.1 Value Proposition Element

The VALUE PROPOSITION is the first of the nine elements of the business model ontology and can be understood as the statements of benefits that are delivered by the firm to its external constituencies (Bagchi and Tulskie 2000). I describe it as the definition of how items of value, such as products and services as well as complementary value-added services, are packaged and offered to fulfill customer needs (Kambil, Ginsberg et al. 1997). In order to better understand value and to construct new and innovative bundles of products and services, I propose a conceptual approach outlined in the VALUE PROPOSITION element. This allows firms to

identify and map their existing value proposition and compare it to the one of their competitors. Furthermore, such a systematic approach makes value innovation easier. The construct of the VALUE PROPOSITION explained in the following paragraphs is inspired by the works of (Kambil, Ginsberg et al. 1997) and (Kim and Mauborgne 2002), which provide the foundation for a more conceptual approach to value.

The element VALUE PROPOSITION is an overall view of one of the firm's bundles of products and services that together represent *value for* a specific CUSTOMER SEGMENT. It describes the way a firm differentiates itself from its competitors and is the reason why customers buy from a certain firm and not from another.

Name of BM-Element	**VALUE PROPOSITION**
Definition	A VALUE PROPOSITION represents *value for* one or several TARGET CUSTOMER(s) and is based on one or several CAPABILITY(ies). It can be further decomposed into its *set of* elementary OFFERING(s). A VALUE PROPOSITION is characterized by its attributes DESCRIPTION, REASONING, VALUE LEVEL and PRICE LEVEL and an optional LIFE CYCLE.
Part of	PRODUCT
Related to	*Value for* TARGET CUSTOMER (1-n) *Based on* CAPABILITY (1-n)
Set of	elementary OFFERING(s) (0-n)
Cardinality	1-n
Attributes	Inherited from elementary OFFERING (section 4.2.2)
References	(Kambil, Ginsberg et al. 1997)

Table 20: Value Proposition

4.2.2 Offering Element

While the VALUE PROPOSITION element gives an aggregated view of a value bundle that a company offers a CUSTOMER SEGMENT it can be further decomposed into a set of elementary OFFERINGs. By describing these different components of a VALUE PROPOSITION a firm can better observe how it situates itself compared to its competitors. This will potentially allow a company to innovate and differentiate to achieve a competitive position.

An elementary OFFERING describes a part of a firm's bundle of products and services. It illustrates a specific product, service, or even product or service feature and outlines its assumed value to the customer. A set of elementary OFFERINGs together represent a VALUE PROPOSITION.

Name of BM-Element	**OFFERING**
Definition	An elementary OFFERING is a part of an overall VALUE PROPOSITION. It is characterized by its attributes DESCRIPTION, REASONING, LIFE CYLCE, VALUE LEVEL and PRICE LEVEL.
Element of	VALUE PROPOSITION (1-n)
Cardinality	0-n
Attributes	*NAME* {abc} *DESCRIPTION* {abc} *REASONING* {USE, RISK, EFFORT} (0-n) *VALUE LEVEL* {ME-TOO, INNOVATIVE INNOVATION, EXCELLENCE, INNOVATION}

	PRICE LEVEL {FREE, ECONOMY, MARKET, HIGH-END} *LIFE CYCLE* {CREATION, PURCHASE, USE, RENEWAL, TRANSFER}

Table 21: Offering

REASONING: This attribute captures the reasoning on why the firm thinks its VALUE PROPOSITION or a specific elementary OFFERING could be valuable to the customer. Normally value is created either through *use* (e.g. driving a car), reduction of the customer's *risk* (e.g. car insurance) or by making his life easier through reduction of his *efforts* (e.g. home delivery of groceries).

{Use}

The bulk of value usually derives from the actual use of a bundle of products and services and is created when product attributes (e.g. features, design, value-added services, support) correspond to customer needs. In other words value is produced when assumed customer value matches perceived customer value after the consumption of a VALUE PROPOSITION or a specific elementary OFFERING.

{Risk} (based on (Kambil, Ginsberg et al. 1997)).

Value can be created by reducing the customer's several risks. This can simply be a financial fear that the price of a purchased good will go down in the future or that the price of a good purchased through a long-term contract might go up (e.g. common in commodity markets). Insurance contracts, buy-back guarantees, and financial options are some of the ways to protect neutralize price risks. Another risk is that a product will not perform as predicted or expected, now or in the future (e.g. obsolescence). This represents a substantial problem to the customer. If you look at software investments for instance, one of the biggest problems is compatibility between different programs, operating systems and sometimes even versions of the same software. There are many different ways a company can address customers' risks.

{Effort}

Companies must also think of new and innovative ways of making their customers' life as easy as possible. Reducing his efforts means creating value through lower search, evaluation and acquisition costs, but also easier and cheaper maintenance, operations and training.

VALUE LEVEL (CUSTOMER UTILITY): Measuring the utility for the customer by measuring the value level of a company's offer allows a firm to compare itself to its competitors. To do this I introduce a qualitative value scale that relates to the value offered by competitors rather than using a quantitative scale that ranges from low to high. The measure goes from *me-too* value (e.g. commodities), over *innovative imitation* (e.g. pocket pc) and *excellence* (e.g. Swiss watches) to *innovation* (e.g. Viagra in the 90's).

{Me-too}

A *me-too* value level simply means that the value of the bundle of products and services the firm offers its customers does not differentiate itself from the one of the competition's. However, differentiation may still take place through a lower price, which is captured in the PRICE LEVEL attribute of the VALUE PROPOSITION or of an elementary OFFERING.

{Innovative imitation}

Innovative imitation means that a company imitates an existing VALUE PROPOSTION or elementary OFFERING, but improves value by adding innovative elements. Dell has done this when they combined mass-market direct selling of PCs over the Internet with the possibility to personalize the configuration of your PC. Traditionally, retailers only sold pre-configured PCs

and customers had to visit speciality stores if they wanted to personalize their PCs.

{Excellence}

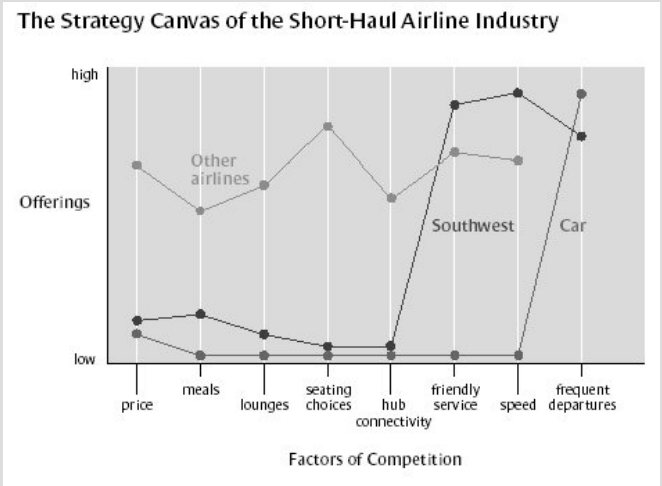
Excellence means that value is pushed to its extremes. An illustrative example of value perfection is the offer of the Switzerland based company Jet Aviation. They provide wealthy private and business customers with a private jet service. The firm claims that it can meet customers travel plans on demand within hours at any airport worldwide at any time. Of course this kind of offer comes with a hefty fee.

{Innovation}

Innovation means that a firm introduces either a completely new product or service or a revolutionary combination of products and services. Recent research has shown that consumers highly valuate innovation and would be willing to pay for new value propositions (Nunes and Johnson 2002). One of the keys to innovation is distinctiveness and impact, which often implies changing the rules of the game and bringing new players into the fold who were not initially considered to be part of the game (Chen and Kai-Ling Ho 2002). When Diners Club issued the first credit card to 200 customers in 1951, it launched a revolutionary change in payments that had a tremendous impact on the financial industry. I place innovation at the high-end of the scale because it gives a firm a temporary competitive advantage through incomparable products, incomparable services or new breakthrough markets (Linder and Cantrell 2000). Of course, at some point unique value and premium rents to the innovator will disappear, either through commoditization (e.g. automatic teller machines) or the introduction of a superior technology (e.g. the fax machine being pushed aside by e-mail) (Ruggles 2002).

Measuring the *VALUE LEVEL* can happen at the aggregate level of a VALUE PROPOSITION or at the detailed level of an elementary OFFERING. But by decomposing a VALUE PROPOSITION into its elementary OFFERINGs and by capturing each ones *VALUE LEVEL* a company can plot its offerings against the one of its competitor's. In order to achieve this, (Kim and Mauborgne 1997) have introduced the concept of the value curve (1997), which they later called strategy canvas (2002). This allowed them to capture and visualize offerings on a graph and visualize a company's competitive position (see Theory Box 2).

Strategy canvas



The strategic profile of Southwest Airlines differs dramatically from those of its competitors in the short-haul airline industry. Note how Wouthwest's profile has more in common with the car's than with the profile of other airlines.

Theory Box 2: Strategy canvas (Kim and Mauborgne 2002)

PRICE LEVEL: This attribute compares the value proposition's price level with the one's of their competitors. The scale goes from *free* (e.g. online newsticker) over *economy* (e.g. Southwest, EasyJet, RyanAir) and *market* (e.g. stocks) to *high-end* (e.g. Rolex).

{Free}

Some companies offer a VALUE PROPOSITION to the customer without asking for financial compensation. They can do this because their business model is based on other sources of income. One example are the free daily newspapers that are distributed to commuters in large agglomerations. The income of these papers are essentially based on advertising and classified ads. Similarly, so-called "free business models" have mushroomed during the summit of the Internet boom, but crashed because of unsustainable revenue streams (e.g. declining advertising revenues). Other companies offer free value and derive revenues from these activities, such as selling freely collected customer information to marketers. Another completely different example of free value in the software industry has mainly become possible because of the Internet. Meant is so-called open-source software, like the operating system Linux or the Office Suite OpenOffice, that are freely available for download over the Web.

{Economy}

This is the low-end of the price scale where a company offers a price that is more attractive than the one of the bulk of its competitors. Often, but not necessarily this goes hand in hand with a lower value level. In order to be able to offer attractive prices over a sustained period of time a firm has to streamline other elements in its business model, such as its activity configuration or its complementary revenue streams. Through attractive prices, made possible because of just-in-time production and direct selling over the Internet, the computer seller Dell was able to achieve a dominant position in computer retailing.

{Market}

Pricing at the market simply means little price demarcation from the rest of the market. Nevertheless, a market price can still seem attractive if special features or attributes of the value proposition signal additional value.

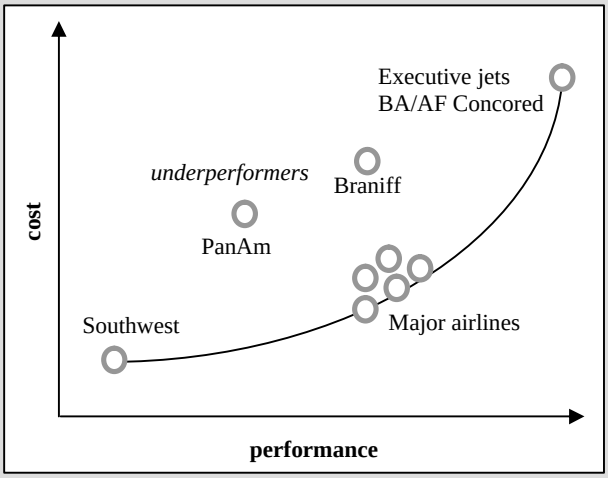
{High-end}

Represents the upper boundary of the price scale. High-end prices are usually found in luxury goods, but also for new and innovative value propositions that still allow charging a premium (Linder and Cantrell 2000).

By capturing the two elementary characteristics of an offering, the value level and the price level (Anderson and Narus 1998), a company can draw a so-called value map (Kambil, Ginsberg et al. 1997). This helps defining its relative position in an industry along the price-value axis (cf. Theory Box 3). Such a map also contains the value frontier, which defines the maximum value (performance of a value proposition) currently feasible for any given cost (minimum price of a value proposition). Market leaders will either extend and rethink their position in the value map to differentiate themselves from their competitors or radically innovate to shift the value frontier. The first strategy consists in extending the value frontier towards the low-end, as has been demonstrated in the airline industry by Southwest in America or easyJet and Ryanair in Europe. These three carriers have adopted a low-frills, low-cost service through which they have become the most successful airlines of the industry. The second strategy is to extend the value frontier towards the high end, as McKinsey, a strategy consulting company, has done during the 1980s and 1990s. By only working with the very best people and only accepting customer projects at the highest level of management, they have dominated high-level consulting for a very long time. The third strategy is to shift the value frontier. This means providing the same level of value at a

lower price, or more value at the same price or even better more value at a lower price than the rest of the industry. This can be achieved through business model innovation, most often based on technological change (e.g. e-business). Dell Computer is a widely cited example of a company that was able to shift the value frontier as it offers its customers high value at moderate prices. Through direct selling and online customer services Dell was able to rapidly achieve a dominant market position in computer and server retailing.

Value map of the airline industry (Kambil, Ginsberg et al. 1997)



In the airline industry the major airlines converged towards similar value propositions, resulting in commoditization and lower profit margins. On the other hand, the extremes of the curve show companies which provide significantly different services. Southwest Airlines is the typical low-cost, low-frills supplier, yet still provides the basic performance attributes customers expect (frequent departure, on-time arrival, good customer service). Executive jets and the Concorde on the other end of the curve, providing extremely high-quality service (flexibility, comfort, privacy) at a corresponding highprice.

Theory Box 3: Positioning in the airline industry

LIFE CYCLE: A value proposition should be studied over its entire life cycle (Anderson and Narus 1998). Therefore I introduce an attribute, which has the goal of capturing at which one of the five stages of the value life cycle an elementary OFFERING creates value. This can be at the moment of the *value creation* (e.g. customization), its *purchase* (e.g. Amazon's one-click shopping), its *use* (e.g. listening to music), its *renewal* (e.g. software updates) or its *transfer* (e.g. disposal of old computers, selling of used books).

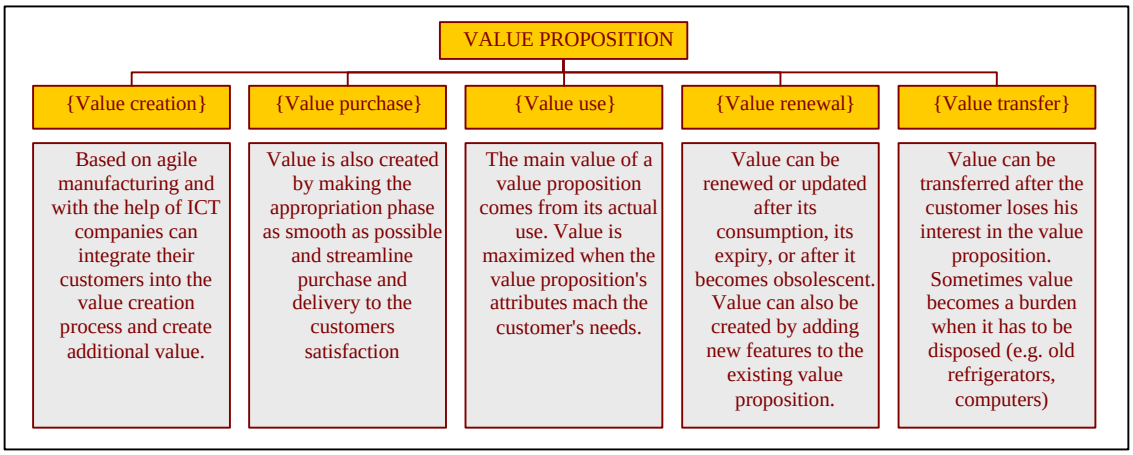


Figure 24: Value life cycle

{Value creation} (requirements)

Traditionally the customer has been more or less excluded from the *value creation* process. Products and services were designed by the R&D and marketing department, based on historical customer data and then thrown on the market. But through the help of ICT the customer can become an important part of the *value creation* process (Piller 2002). The concept of mass-customization and agile manufacturing (Maskell 2001) allow company's to integrate their customers by letting them personalize or configure their value package (cf. Illustration Box 4).

Value Creation and Customer Participation

A Dell customer can chose from a limited set of electronic components and compose his own PC or server on the company's Website. CMAX, a company founded by experienced shoe crafters who honed their skills at adidas and Nike, allow their customers to design their personal footgear over the Internet and get them delivered to their home. Customization may also allow manufacturers to charge higher prices. In the sport shoe market, *Adidas* can charge up to 50 percent higher premiums for its customized sport shoes brand “mi adidas” (Piller and Moeslein 2002). However, the concept of customer participation in the value creation process is not limited to more or less simple consumer goods. Through the help of ICT manufacturers can go as far as abandoning their attempts to understand user needs in detail and let their customers design their own products and service by giving them appropriate toolkits to do this (von Hippel 2001). The chip industry in the early 1980s, for example, has been completely transformed by an innovative company called LSI Logic (Thomke and von Hippel 2002). Through user-friendly toolkits they let their customers test chip designs, using simulation and digital prototypes. The market for such custom-integrated circuits reached about $15 billion in 2000. Another illustrative example is the one of BBA, now called International Flavors and Fragrances. The company developed an Internet-based tool containing a large data-base of flavor profiles. A customer can select and manipulate that information on a computer screen and send his new design directly to an automated machine that will manufacture a sample within minutes (Thomke and von Hippel 2002).

Illustration Box 4: Value Creation and Customer Participation

{Value purchase} (acquisition)

Value can also be created during the *purchase* phase by ameliorating and facilitating the customer's buying experience. The first step to improvement is streamlining the transaction in itself. An often cited example of convenient buying of consumer goods is Amazon.com's one-click shopping, which allows customers to purchase items through a single mouse click on their Website. For more expensive and complex industrial goods ameliorating the buying experience can include innovative price negotiation mechanisms, contract management, convenient billing and payment or attractive financing mechanisms. The next step to creating value in the *purchase* phase is improving fulfillment. As outlined above, Federal Express improved their VALUE PROPOSTION of delivering packages by offering an online tracking service. Some companies go even further and build their entire VALUE PROPOSTION on fulfillment. Online groceries, such as Peapod in the United States or LeShop in Switzerland essentially distinguish themselves from traditional competitors by offering home delivery of perishable food.

{Value use} (ownership)

Probably the most traditional and best known phase of the value life cycle is the value derived from its *use*. In other words the value that comes from the actual consumption of a products and services. The dominant part of the VALUE PROPOSITION is often found at this stage of the value life cycle. Some companies define a core bundle of value, a basket of basic products and services, around which they “build” complementary value at additional cost. ABB and Microsoft have dubbed this "naked solutions" or "naked systems" (Anderson and Narus 1995) around which they wrap other services. However, as explained above ICT has opened up a lot of new opportunities for creating information-based or information-enriched products and services

(Evans and Wurster 1997).

{Value renewal} (ownership)

In some cases it can be interesting to *renew* value after or during its consumption. This can be necessary when value is used up (e.g. an empty phone card), expires (e.g. expiry of a magazine subscription), becomes obsolescent (e.g. outdated machinery) or is disfunctional (e.g. need for a car service). Sometimes it may also be interesting to create additional value by adding new features to an existing value proposition (e.g. new titles for a game console). Finally, value *renewal* could also mean gradually updating value, as it is very common for software products where software patches, general updates or major upgrades to newer versions increase customer value.

{Value transfer} (retirement)

At this last stage of the value life cycle, the customer has the possibility to *transfers* the value he has acquired. He may want to do this because the VALUE PROPOSITION has lost value for him, but he can still gain something by transferring this value. Amazon.com, for example, lets its customers sell their used books over the same Website they sell new books from. In other cases value may become a burden after its consumption, because it has do be disposed. This is the case for refrigerators, computers and batteries, where sellers offer to take charge of disposal.

Similar to a VALUE PROPOSITION's overall price, every elementary OFFERING equally comes at a specific price. But often elementary OFFERINGs are for free because they have the sole function of complementing and making a core elementary OFFERING more attractive. The VALUE PROPOSITION of an online bookseller, for instance, is composed of a multitude of elementary OFFERINGs, such as the large range of books, personalized book recommendations, excerpts and book critics. But the only costs the customer finally has to bear is the book price and probably delivery charges. However, it makes a lot of sense to price elementary OFFERINGs because it allows a better comparison to the competitors' set of elementary OFFERINGs that may be priced differently. Also, companies increasingly start to offer so-called "naked solutions" or "naked systems" (i.e. core elementary OFFERINGs) to which customers can add further features according to their requirements (i.e. complementary elementary OFFERINGs) at an additional cost (Anderson and Narus 1995). This essentially allows firms to offer cheaper core VALUE PROPOSITIONs.

4.2.3 Analyzing Value Propositions - the Case of easyMoney.com

The main goal of conceptualizing VALUE PROPOSITIONs and decomposing them into their elementary OFFERINGs is a better understanding of the value a firm offers to its customers and the possibility to compare them to a competitor's VALUE PROPOSITION. Further, it allows a firm to understand where it could innovate and use ICT to add new information-based value components. The strategic tools we can derive from this conceptualization are the strategy canvas (Kim and Mauborgne 2002), the value map (Kambil, Ginsberg et al. 1997) and a combination of the two, by also considering the entire value life cycle. I illustrate this with a mini case in the credit card industry.

easyMoney.com is a credit card company founded by Haji-Ioannou who has also created easyJet, easyCar, easyInternetCafé, easyValue.com and easyCinema.com. Its value proposition consists of customized credit cards at attractive prices. Through transparent pricing, clear product offerings, the use of ICT and avoiding cross-subsidies between products and customers the credit card client only pays for what he gets. Table 22 and Figure 25 give an overview of the core elementary OFFERINGs of easyMoney.com. The data has been collected from the easyMoney.com website.

	Card Builder	Personalized credit card	Online account
Description	With the so-called Card Builder customers can select their own individual combination of interest rate, cashback rewards, annual fee and servicing options. They build their own personalized credit card	The easyMoney.com credit card is accepted at over 19.1 million locations worldwide displaying the MasterCard logo and is financially attractive.	Customers can handle their account online and receive their statements electronically. At every moment they have an up to date overview of their account history.
Reasoning	A customized credit card reduces the financial risk of paying for options the customer doesn't need nor use.	By configuring his own credit card the customer benefits from attractive prices because he pays for what he gets.	Clients can conveniently manage their accounts from their PC and profit from lower handling costs.
Value life cycle	{Value creation}	{Value Use}	{Value Use}
Value level	{Innovation}	{Innovation}	{Innovation}
Price level	{free}	{economy}	{free}

Table 22: The core elementary OFFERINGs of easyMoney.com

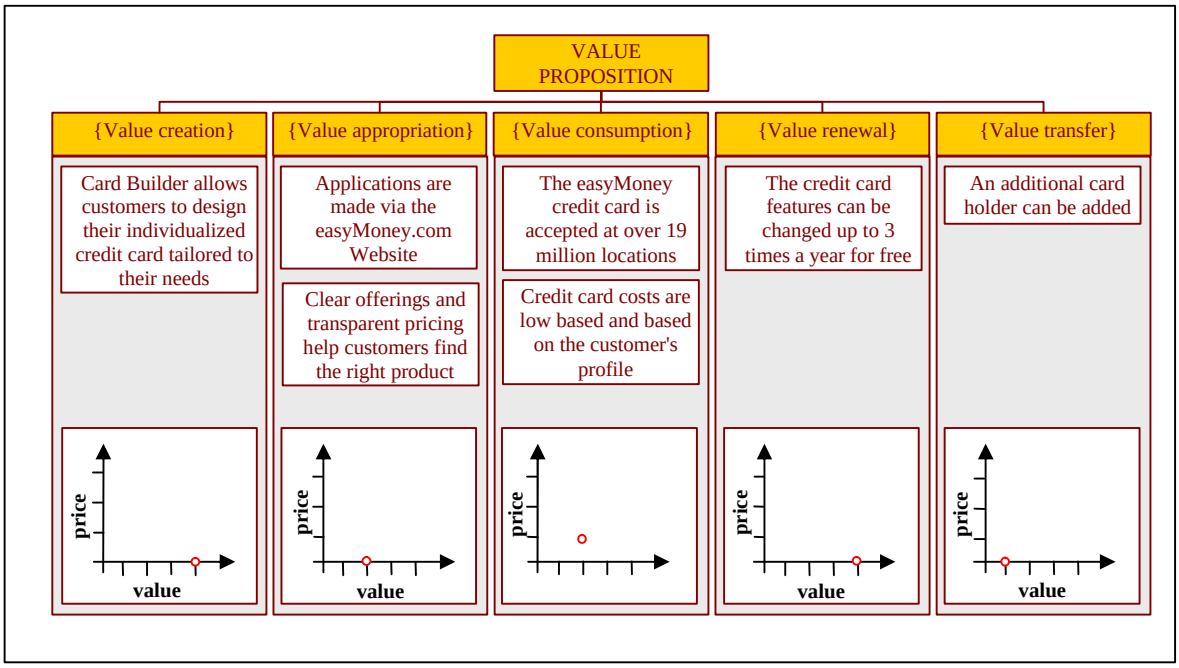


Figure 25: easyMoney.com's decomposed value proposition

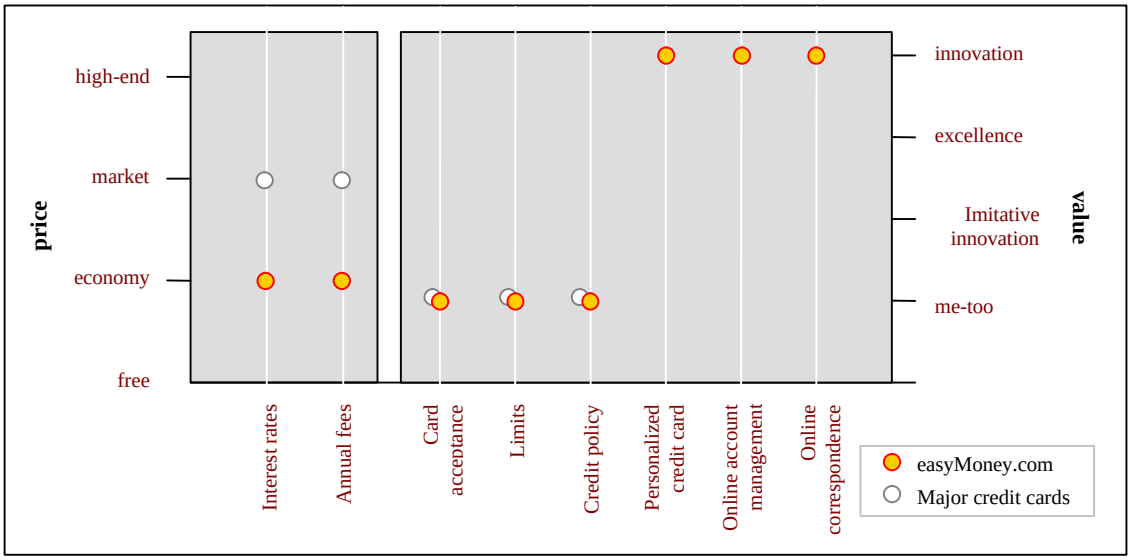


Figure 26: Strategy canvas easyMoney.com based on (Kim and Mauborgne 2002)

Figure 26 shows a simplified strategy canvas for easyMoney.com and visualizes where its main differentiation can be found. Namely these are in price advantages and new innovative features, such as the personalized credit card and the online account handling. The value map in Figure 27 shows that easyMoney.com has shifted the value frontier by offering innovative value to cheaper conditions. In other words by applying a new business model supporting its value proposition it has modified the competitive landscape.

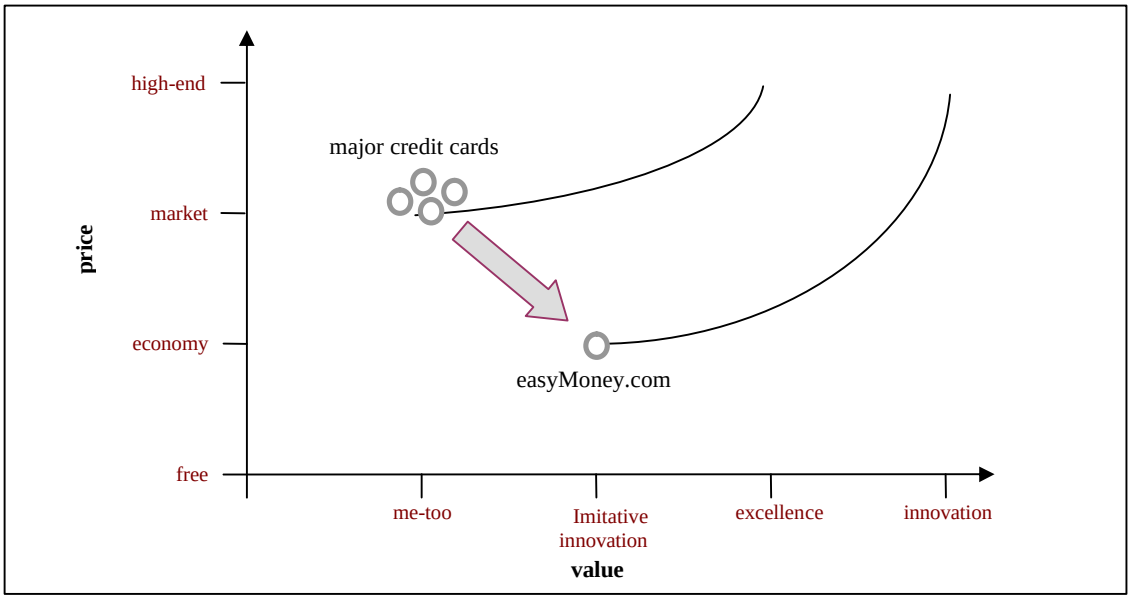


Figure 27: easyMoney.com's Value map, based on (Kambil, Ginsberg et al. 1997)

4.3 CUSTOMER INTERFACE

The second pillar of the business model ontology is Customer Relationship, though this concept and so-called Customer Relationship Management, short CRM, have somewhat acquired the temporary reputation of management and IS fads. But the relationship with customers is, no doubt,

essential for companies. The problem is that hundreds of application vendors praise the merits and miracles of their CRM software (see Figure 28 for IT use in customer relations). Consequently, CEO's and CIO's sometimes tend to reduce managing customer relationships to a problem that can be resolved by technology. Rather, they should perceive customer relationships and CRM as a conceptual management problem that can be resolved with the assistance of IT. Therefore managers should consider a conceptual approach to customer relationship as I do in the customer relationship pillar of the business model ontology. This will help understanding the essence of and the relation between a company's value proposition, target customer segments, distribution channels and the actual customer interactions. This understanding is particularly important in a time where e-business multiplies the number of channels, intermediaries and customer interactions and therefore causes more complexity.

The customer relationship element refers to the way a firm goes to market, how it actually reaches its customers and how it interacts with them. ICT has traditionally had a very strong influence on the ways companies organize their customer relationships. The use of databases for managing customer related information, the introduction of scanners in supermarkets, the offering of toll-free numbers connected to call centres or the use of new distribution and communication channels are just some of the numerous applications that have transformed customer relationship. Especially the dissemination of the Internet has further increased the range of possibilities of interacting with customers. Generally, it can be said that the falling cost and improving performance of ICT has contributed to the facilitation of customer-related information gathering and customer- and product-related information diffusion. Data warehousing, data mining and business intelligence, for example, are technologies that have allowed managers to gain insight on their customers buying behavior and improve customer relationship. These insights are used to create what Hamel (Hamel 2000) calls the positive feedback effect. A firm with a large base of users, and a way of rapidly extracting feedback and information from those users, may be able to improve its products and services faster than its competitors. In this virtuous circle products and innovation can be improved, which in return attracts new customers. Further, exploiting customer information can allow managers to discover new and profitable business opportunities and can allow them to ameliorate customer satisfaction. As shown previously ICT also helps companies to provide their customers and prospects with ever richer information (Evans and Wurster 1997) and offer them innovative ways of interaction and thus contribute to the firms value proposition. Finally, in order to serve customers better or to reach new markets companies introduce new distribution and communication channels, such as the Internet or mobile phones, but also new relationship mechanisms, such as personalization and trust.

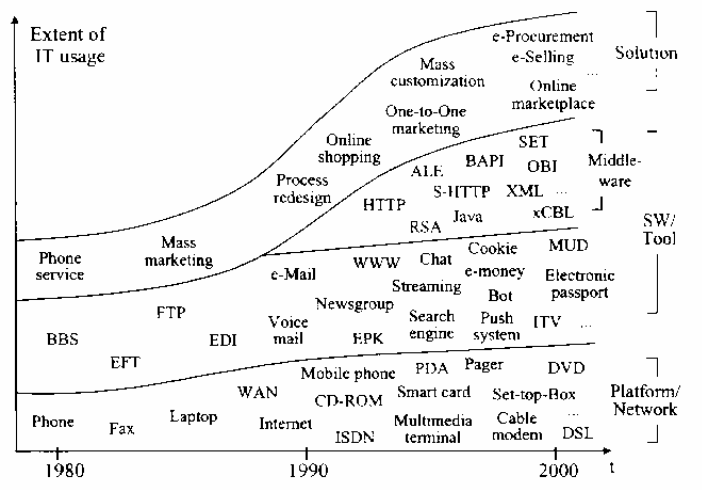


Figure 28: Increasing IT use in the customer relationship (Muther 2002)

Definition: The CUSTOMER INTERFACE covers all customer related aspects. This comprises the choice of a firm's TARGET CUSTOMERs, the CHANNELs through which it gets in touch with them and the kind of RELATIONSHIPs the company wants to establish with its customers. The CUSTOMER INTERFACE describes how and to whom it delivers its VALUE PROPOSITION, which is the firm's bundle of products and services (see Figure 29).

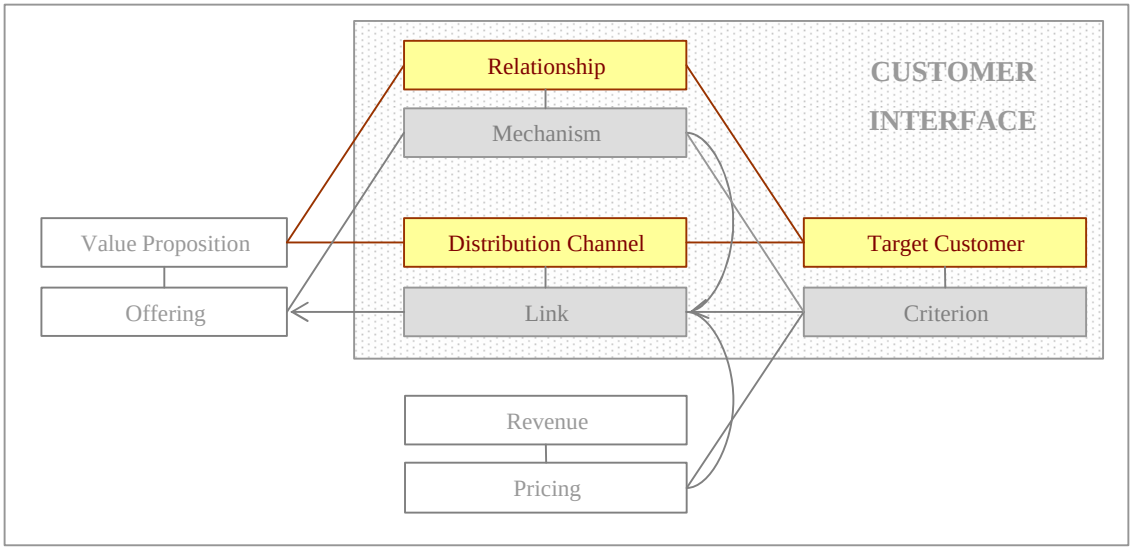


Figure 29: Customer Interface

4.3.1 Target Customer Element

The TARGET CUSTOMER is the second element of the business model ontology. Selecting a company's target customers is all about segmentation. Effective segmentation enables a company to allocate investment resources to target customers that will be most attracted by its value proposition. The most general distinction of target customers exists between business and/or individual customers, commonly referred to as business-to-business (B2B) and business-to-consumer (B2C). The TARGET CUSTOMER definition will also help a firm define through which channels it effectively wants to reach its clients.

Name of BM-Element	TARGET CUSTOMER
Definition	A TARGET CUSTOMER segment defines the type of customers a company wants to address.
Part of	CUSTOMER INTERFACE
Related to	*Receives* a VALUE PROPOSITION (1-n)
Set of	CRITERION(s) (0-n)
Cardinality	1-n
Attributes	Inherited from CRITERION (see section 4.3.2)
References	(Kotler 1999) (Hagel and Armstrong 1997)

Table 23: Target Customer

Segmentation has a long history and goes back to the 1950s (Winter, 1984). But even nowadays, in the one-to-one marketing era, where customers can potentially be addressed one by one, market segmentation keeps its value. In fact, ICT helps companies make the strategic choice to target their market at any level between "mass" and "one-to-one by balancing revenue against cost (Wedel, 2001). Especially post-hoc market segmentation techniques like data mining, multidimensional segmentation and data clustering with artificial neural networks can lead to more efficient marketing and enhance profitability (Neal and Wurst, 2001).

With the expansion of reach through ICT, such as the Internet, companies increasingly target not only groups that are geographically localisable, but also widely dispersed online communities with common characteristics. Hagel and Armstrong (1997) divide these into communities of transaction, interest, fantasy and relationship.

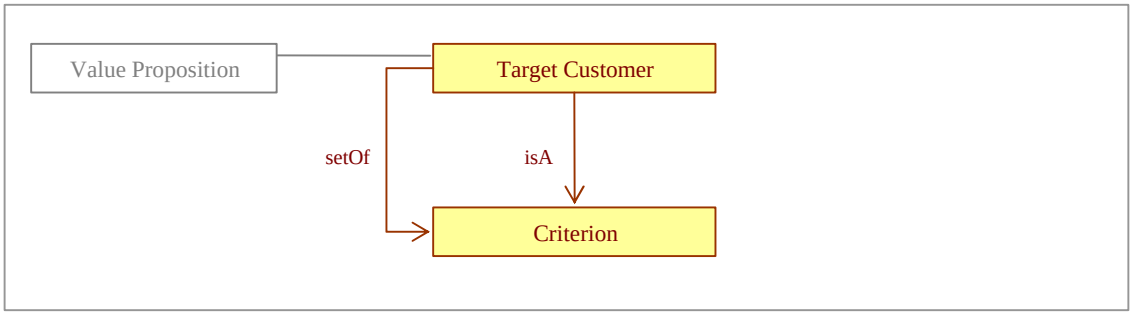


Figure 30: Target Customer

4.3.2 Criterion Element

In order to refine a customer segmentation companies usually decompose a TARGET CUSTOMER segment into a set of further characteristics I call CRITERION. These could be of geographical or socio-demographic nature.

Name of BM-Element	CRITERION
Definition	A CRITERION defines the characteristics of a TARGET CUSTOMER
Element of	TARGET CUSTOMER
Cardinality	0-n
Attributes	*NAME* {abc} *DESCRIPTION* {abc}

Table 24: Criterion

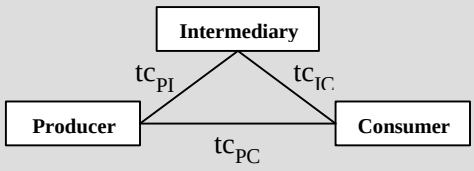
4.3.3 Reaching Customers

Before coming to the third business model element in the next section I want to outline how ICT

and particularly the Internet has had an impact on how companies reach their customers. Early predictions of e-commerce forecasted a demise for intermediaries between producers and consumers. The rationale was that lower transaction costs would enable producers to bypass intermediaries and deal directly with consumers (Malone, Yates et al. 1987), which would therefore benefit from lower prices (Benjamin and Wigand 1995). Ever since, a debate on disintermediation has raged in both practitioner and research publications (Scott 2000). While disintermediation essentially stresses process and cost issues, it pays less attention to other value-adding roles of intermediaries, such as brand management and customer "possession". Take Sunburst Farms, a flower growing and importing cooperative, as an example (Gallaugher 2002). Under the name FlowerNet they were one of the first firms to take flower orders over the Web, thus eliminating both the local floral shop and order-taking flower networks like FTD. But despite early market-entry and low prices for fresh flowers FlowerNet failed, whereas competitors FTD.com and 1800Flowers.com can present impressive results. This can be mainly explained through the negative impacts of disintermediation, which were the elimination of the strongest brands in the eyes of consumers. Beyond disintermediation, time has shown that ICT has also opened up new markets and new opportunities, for new intermediaries. These so-called cybermediaries (Sarkar, Butler et al. 1995) or Channel Extending Intermediaries (CEIs) (Gallaugher 2002) insert themselves between existing elements of the chain, aggregating buyers and suppliers into new markets and leveraging opportunities to add value that address weaknesses in traditional systems (cf. Theory Box 4). Priceline.com, for example, positioned itself as a liquidation service for the travel industry. On their website customers can name a price they want to pay for such things as an airline ticket or a hotel room and priceline.com's brand-name partners will accept this request based on their availability. In summary it can be said that ICT has threatened intermediaries in many industries, but has equally created new opportunities. Specifically, buyers, suppliers and intermediaries must reassess where value can be added through ICT and which functions become redundant.

Four outcomes model (Sarkar, Butler et al. 1995)

Based on transaction cost theory, the authors of the four outcomes model illustrate that increased intermediation is just as plausible as disintermediation. They argue that one must compare transaction costs (tc) between producers, consumers and intermediaries (P, C, I) before (tc) and after (tc') the emergence of the commercial Internet to analyze the issue.



	$tc_{PC} < tc_{PI} + tc_{IC}$ **Pre-Internet**	$tc_{PC} > tc_{PI} + tc_{IC}$
$tc'_{PC} < tc'_{PI} + tc'_{IC}$ **Post-Internet**	I. Internet Supplemented Direct market Ultra-intermediation	II. Threatened Intermediaries Dis-intermediation
$tc'_{PC} < tc'_{PI} + tc'_{IC}$	III. Cybermediaries Extra-intermediation	IV. Internet Supplemented Intermediaries Re-intermediation

Theory Box 4: Four outcomes model

4.3.4 Channel Element

The distribution CHANNEL is the third element of the business model ontology. Distribution channels are the connection between a firm's VALUE PROPOSITIONs and its TARGET CUSTOMERs. A distribution CHANNEL allows a company to deliver value to its customers, either directly, for example through a sales force or over a Website, or indirectly through intermediaries, such as resellers, brokers or cybermediaries. The topic of channels has become exciting in recent years with the proliferation of new successful channels and the promise of a stream of more new ones resulting from advances in ICT (Wyner 1995). But this magnitude of change demands a strategic perspective that views channel decisions as choices from a continually changing array of alternatives for achieving market converge and competitive advantage (Anderson, Day et al. 1997). In this part of the ontology I outline the concepts that allow firms to formulate a channel strategy, which can be defined as the organization of a set of mechanisms or a network via which a company "goes to market" .

A distribution CHANNEL describes how a company gets in touch with its customers. Its purpose is to make the right quantities of the right products or services available at the right place, at the right time to the right people (Pitt, Berthon et al. 1999) - subject of course, to the constraints of cost, investment, and flexibility (Anderson, Day et al. 1997). A distribution CHANNEL links a company's VALUE PROPOSITION to its CUSTOMER(s) and can be maintained by a firm itself or by its partners.

Name of BM-Element	**CHANNEL**
Definition	A distribution CHANNEL describes how a company *delivers* a VALUE PROPOSITION to a target CUSTOMER SEGMENT. Normally a firm disposes of one or several direct or indirect CHANNEL(s) that can be decomposed into their LINK(s).
Part of	CUSTOMER INTERFACE
Inherits from	LINK
Related to	*Delivers* VALUE PROPOSITION (1-n) *Delivers to* TARGET CUSTOMER (1-n)
Set of	LINK(s) (0-n)
Cardinality	1-n
Attributes	Inherited from the LINK element (see section 4.3.5)
References	(Moriarty and Moran 1990)

Table 25: Distribution Channel

ICT, and particularly the Internet, has a great potential to complement rather than to cannibalize a business's existing channels (Porter 2001; Steinfield, Bouwman et al. 2002). However, selling through several channels simultaneously eventually causes channel conflict when they compete to reach the same set of customers (Bucklin, Thomas-Graham et al. 1997).

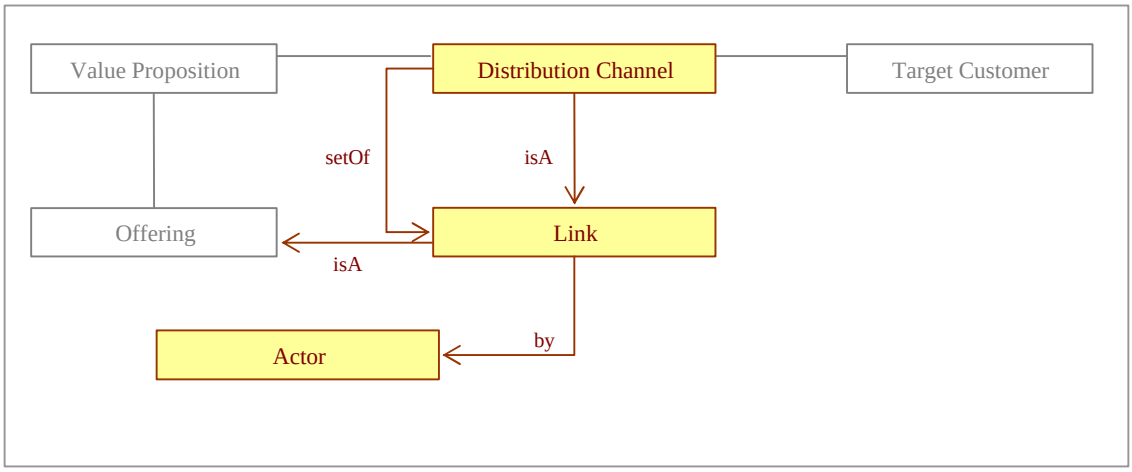


Figure 31: Distribution Channel

4.3.5 Link Element

While the CHANNEL element gives an aggregated view of how a company reaches its customers it can be further decomposed into its channel LINKs. I do this because channels are not the basic building blocks of a marketing system; the channel tasks are (Moriarty and Moran 1990). By describing these different components of a CHANNEL a firm can better observe how it gets in touch with its customers compared to its competitors.

A channel LINK describes a part of a firm's CHANNEL and illustrates specific marketing tasks. A set of channel LINKs together represent a CHANNEL. The channel LINKs of the different CHANNELs may sometimes be interrelated, in order to exploit cross-channel synergies. In addition to the traditional role of simply delivering value, modern channels and their channel LINKs increasingly have a potential for value creation and thus contribute to a firm's VALUE PROPOSTION (Wyner 1995). Therefore the channel LINK element inherits the characteristics of the element OFFERING because it can simultaneously be part of a channel and of the firm's value creating elements (i.e. the VALUE PROPOSITION).

Name of BM-Element	**LINK**
Definition	A channel LINK is part of a CHANNEL and describes a specific channel role. It may be part of the VALUE PROPOSITION and it may be related to an other LINK.
Element of	CHANNEL (1-n)
Inherits from	OFFERING
Related to	A LINK can be *connected to* an other LINK (0-n) The channel role described by a channel LINK is *delivered by* an ACTOR (0-n)
Cardinality	0-n
Attributes	Inherited from OFFERING (section 4.2.2) *CUSTOMER BUYING CYCLE* {AWARENESS, EVALUATION, PURCHASE, AFTER SALES} (overwritten by *VALUE LIFE CYCLE* if the LINK element is also an OFFERING)

Table 26: Link

REASONING (inherited from* OFFERING*): Similar to the reasoning on OFFERINGs a channel LINK can (but does not necessarily have to) contribute to value creation in three distinct ways: Either through *use*, reducing *risk* or reducing a customer's *efforts*.

{Use}

ICT has had an enormous impact on transforming simple distribution channels into value adding components of value propositions. Actually the term communication channel is more appropriate because throughout the channel tasks the exchange of information between firm and customer is gaining importance. Corporate Websites for instance are not only a place for ordering products, but also a source for product and service information, for online problem solving or specific after sales services. A LINK creates value if it matches customer needs and can be integrated into a company's VALUE PROPOSITION.

{Risk} (based on (Kambil, Ginsberg et al. 1997))

A LINK may also reduce risk. Think of the difference of a customer buying a computer on a Website and a customer buying a computer in a specialized PC store. The former may buy online because he knows exactly what he wants and does therefore not need advice, whereas the latter may prefer the recommendations of an in store vendor to chose the right PC. Although these two channel functions fulfil the same role, letting the customer buy a computer, the store and the vendor add value by reducing the customer's risk of buying a PC that does not correspond to his profile. On the other hand a firm might use a Website to provide a variety of product related information that can help customers make informed choices by themselves. A different example of reducing the customer's risk is integrating him into the value creation process through customization, as described previously in the elementary OFFERING. This often takes place through virtual channels such as the Internet.

{Effort}

One of the most recognized impacts of ICT on channels and value creation has been on the reduction of customer efforts. Numerous companies have betted on the Internet as a channel for convenient shopping, but not all of them have fully understood the consequences. If you look at the grocery industry, Websites for online shopping have mushroomed during the late 90's. And even though they provided magnificent consumer-friendly shopping sites with home delivery, practically all of them failed. This is essentially due to their biased business models. Although they created impressive customer value through reducing customer efforts, they have neglected other business model elements, like infrastructure management and the resulting costs. However, if online channels are soundly integrated into a business model they can have remarkable impacts. Many companies have improved after-sales through the use of virtual channels. They have reduced customer efforts through online troubleshooting, manuals, FAQs or direct links to product engineers.

CUSTOMER BUYING CYCLE

A channel should be studied over the customer's entire buying cycle. Therefore I introduce an attribute, which has the goal of identifying which one of the functions of the customer buying cycle a channel LINK fulfils (based on (Ives and Learmonth 1984; Ives 1999; Muther 2002)). From the customer realizing his needs, through the collection of product and price information, the sales transaction all the way to the use of the product or service, the Customer Buying Cycle reflects all possible contact points between a supplier and a customer in the context of the acquisition, possession and disposal of the product or service (Muther 2002). The cycle is divided into four phases, namely the customer's *awareness* (e.g. promotions), the *evaluation* of his needs and the matching to the company's VALUE PROPOSTION (e.g. sales force), the moment of *purchase* (i.e. the actual transaction and fulfilment), and *after sales* (e.g. maintenance). Figure 32 resumes the roles of the four stages. Its cyclical form indicates the ultimate goal of retaining the customer after the sales and re-introducing him into the first stage of the buying cycle.

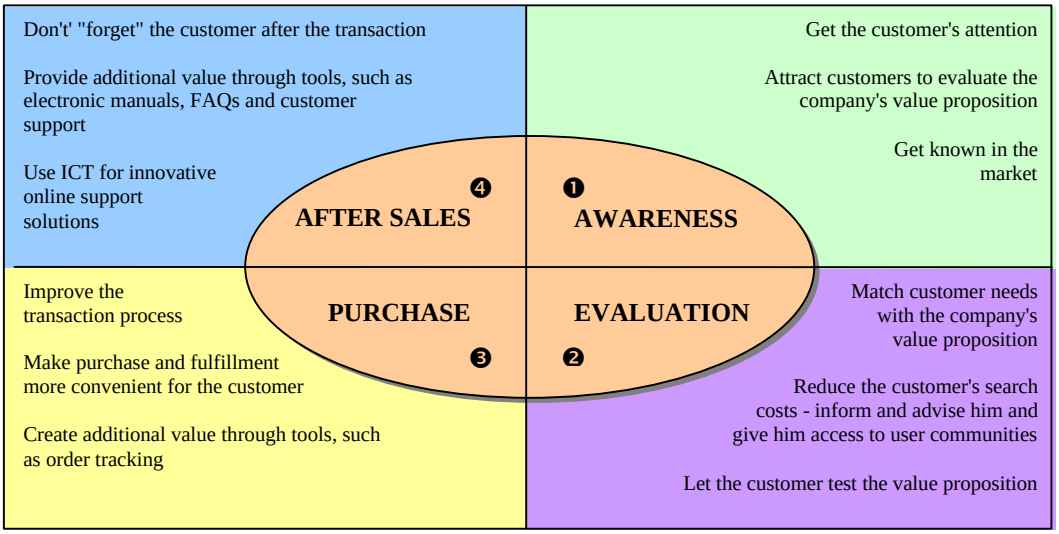


Figure 32: Customer Buying Cycle (CBC)

{Awareness}

At this stage of the Customer Buying Cycle the customer identifies a company's VALUE PROPOSITION that may match his needs. He develops the awareness that an organization exists and that it might be able to fulfill his requests. The company tries to reach as many potential customers as possible by means of advertising, promotions, public relations and partnerships. Amazon.com was highly successful in reaching and attracting new customers through exploiting the Internet media hype on the one hand and by implementing a network of affiliated Websites on the other hand. Affiliate or associate programs pay commissions to somebody who refers visitors to their products or services and who makes a purchase.

{Evaluation}

Once a customer has identified a specific firm as a potential solution provider to his problem or his needs he will want to learn more about the organization and the bundle of products and services it offers. At this stage of the customer buying cycle it is important to provide the customer with all the information necessary to assist him in his evaluation process. As mentioned earlier, ICT helps firms improve reach and richness of the information they offer their customers (Evans and Wurster 1997). This includes detailed information on the organization and its references, the value proposition, or availability of products. Besides trained sales forces or value added resellers (VAR), companies increasingly make use of multimedia applications that are able to demonstrate certain aspects of their value proposition. The advice the customer seeks for can be provided either by human intervention, by ICT tools or a mixture of both. The recent advances in artificial intelligence (AI) and electronic agents have allowed to partially replace human assistance in customer advice. However, it is important to let the customer chose between human and machine advice by offering him access to personal assistance. Several tools, such as Online Chat, Voice-over-IP or Web cams streamline the consulting process and may make physical face-to-face contact unnecessary. But clients do not necessarily rely exclusively on the information provided by a company and additionally inform themselves through user communities or consumer groups. Finally, many companies let their customer test their value proposition in one way or another to let them decide if their perceived customer needs correspond to a value proposition's assumed customer needs.

{Purchase}

During the purchase phase the actual transaction takes place. This includes negotiation, decision, contract, order & tracking, billing & payment and fulfillment. Whereas negotiation, decision and contracting are very important in B2B they are less significant in B2C. However, technology allows to streamline these steps and handle them in new kinds of ways and through new channels. Electronic contracting can make processes for buyers and sellers more efficient, and, with the legal acceptance and adoption of digital signatures, electronic contracts have the same legal bindings as their traditional paper counterparts. Order tracking becomes an important element for customers after the transaction has taken place and allows them to conveniently follow their orders on the sellers Website. Finally, billing and payment increasingly move towards electronic channels. An evolution that remains to be followed is the one of micro-payments where customers pay minimal amounts of money for "small" products, such as newspaper articles.

{After sales}

This last phase is probably the most promising one, because it has the potential to create loyal customers. After sales services enormously contribute to a customer's satisfaction by helping him profit from the value proposition and by assisting him in case of problems. It can embrace implementation and use, training, maintenance, monitoring, troubleshooting and reverse logistics (i.e. disposal).

Figure 33 gives an overview of the specific tasks that can be found throughout a channel and that are grouped by the stages of the customer's buying cycle.

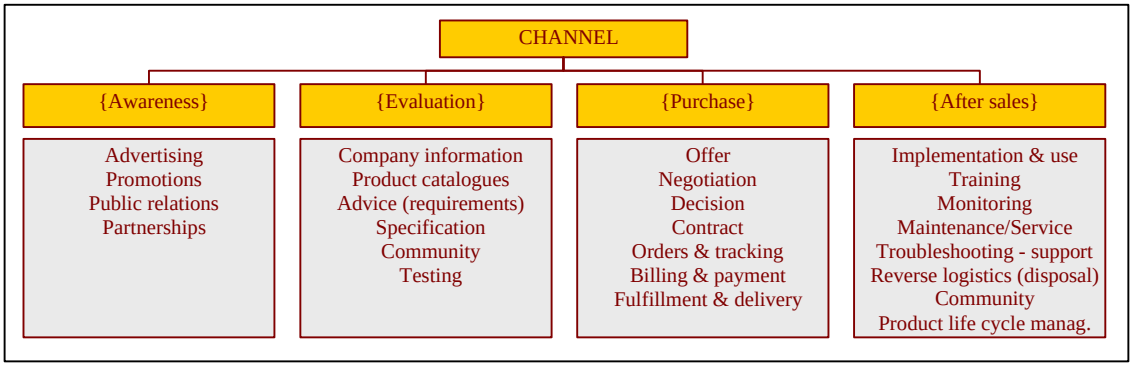


Figure 33: CBC and channel functions

VALUE LIFE CYCLE (inherited from OFFERING)

If a channel LINK is also a part of the VALUE PROPOSITION the attribute *value life cycle*, overwrites the attribute customer buying cycle. The value life cycle relates to the customer buying cycle as illustrated in Figure 34.

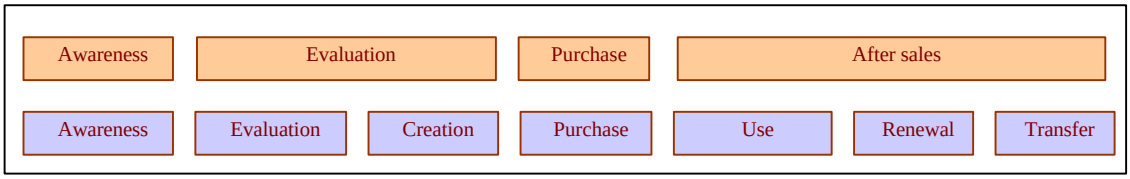


Figure 34: The Value Life Cycle can overwrite the Customer Buying Cycle

VALUE LEVEL and PRICE LEVEL (inherited from* OFFERING*)

These two attributes are inherited from the OFFERING if the LINK is also part of the VALUE PROPOSITION.

4.3.6 Channel strategy

Before coming to the next business model ontology element I show a short example of how conceptualizing channels can lead to a management tool. The distribution CHANNEL element has important implications for management because companies reach their customers through various different channels. While the sports brand The Gap owns a network of over 2000 retail stores, Tupperware sells its food storage containers through over 950'000 independent Tupperware "consultants". The car manufacturer BMW reaches its customers in the United States through about 300 franchised dealers selling its automobiles, but designs and implements national advertising itself (Dolan 2000). As illustrated earlier, the computer manufacture Compaq (now HP) sells its products primarily through third-party resellers, whereas Dell concentrates on direct channels, such as the Internet and telephone. These examples illustrate just some of the multiple ways to go to market, while the advances in ICT promise even more to come (Wyner 1995). This evolution increases complexity and calls for an integrated approach to channel design and management.

The management tool I propose to tackle these issues is based on the Customer Buying Cycle (Ives and Learmonth 1984; Ives 1999; Muther 2002) and the so-called Hybrid Grid (Moriarty and Moran 1990; Dolan 2000). This tool consists of a matrix with the different phases of the customer buying cycle on the one axis and a company's range of CHANNELs on the other axis. I illustrate this in Figure 35 with a simplified example of the bookseller Barnes and Nobles who has a wide range of virtual and physical channels. The most important channel is the network of approximately 900 Barnes & Nobles stores that employ more than 32'000 booksellers. Under the pressure of Amazon.com and other online bookstores B&N launched its own online store in 1997 and established its first virtual channel. Shortly after followed a further virtual channel, B&N's affiliation program that allowed partners to sell B&N books over their own websites and earn a commission. The first truly innovative online channel followed with Barnes & Noble University that offers courses over the Internet in order to stimulate the company's bookselling. The boxes in Figure 35 which you find at the intersection of the CHANNELs and the four phases of the customer buying cycle represent the aggregated channel LINKs of the company. These LINKs are connected to each other inside and/or across different CHANNELs. The first described channel, the Barnes & Nobles stores, is a fully integrated channel with LINKs from awareness to after sales. The B&N’s affiliation network on the other hand is only a partial channel with LINKs that fulfill the role of creating awareness and helping in evaluation. The other roles are fulfilled by other channels, to which the affiliation network is connected to. Yet, connections can also exist between two full CHANNELs, such as between B&N’s stores and its website. With the online store locator offline customers can find physical outlets on B&N’s website and on the other hand online customers have the possibility to return the books they bought over the Web at offline stores.

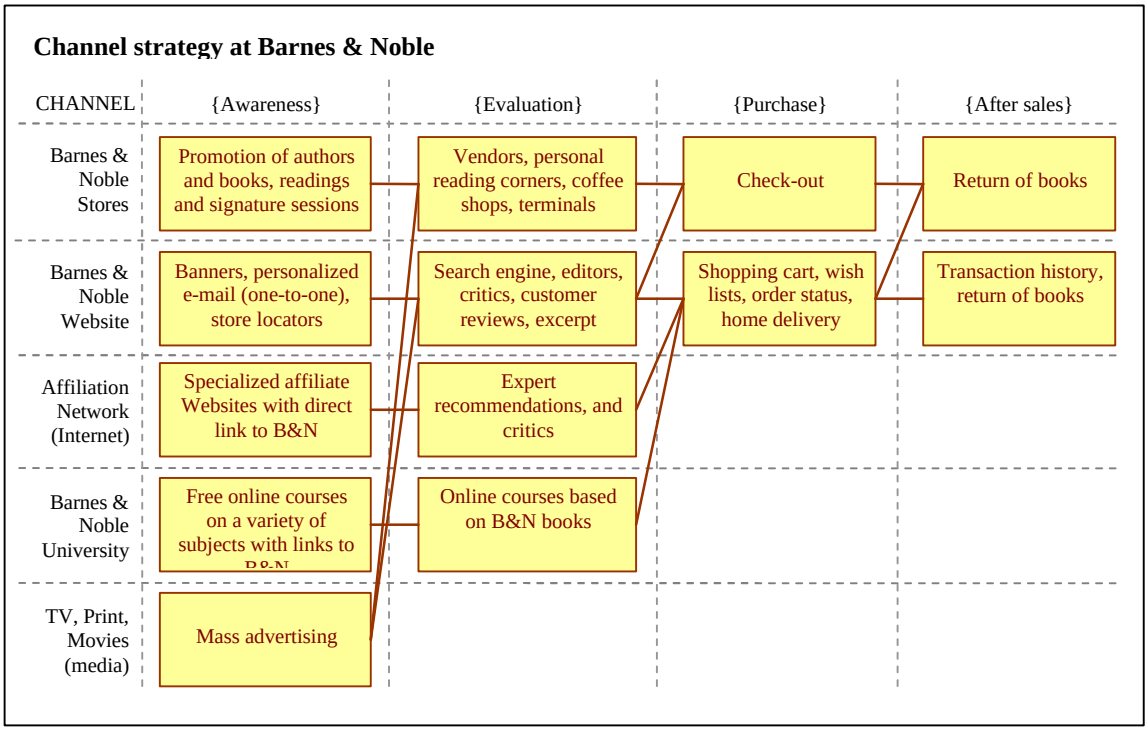


Figure 35: Channels at Barnes & Noble (based on (Moriarty and Moran 1990; Dolan 2000))

Another illustration of a company's channel strategy is presented in Figure 36 where I outline the case of the mobile phone manufacturer Nokia, who has a wide range of virtual, physical, owned and partner CHANNELs. As in the previous figure on Barnes & Noble the boxes represent the aggregated channel LINKs and are connected to each other inside and/or across different CHANNELs. Nokia's most important sales channels are the national mobile phone network operators, which sell the bulk of its phones, and, the various electronics or other retailers. But the other channels, such as Nokia.com, Club Nokia or Nokia Academy (a place to learn about Nokia phone features) also have a very important role to play. Club Nokia, for instance, re-establishes a direct communication link between Nokia and the final customer, which has traditionally been the operators' sphere of influence. This link has an enormous value in loyalizing customers, selling them additional products and collecting information on their behavior.

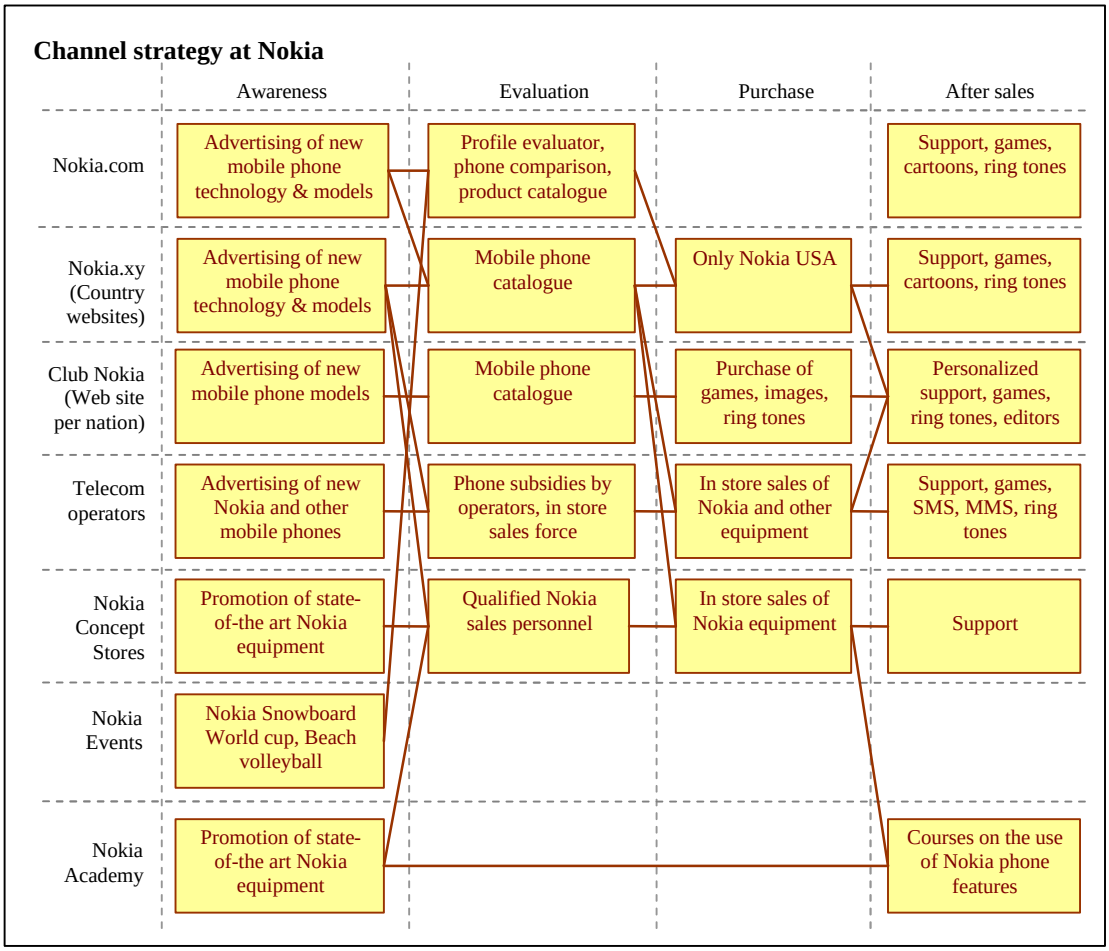


Figure 36: Channels at Nokia Mobile Phones (based on (Moriarty and Moran 1990; Dolan 2000))

4.3.7 Channel Conflict

An important element of a channel strategy in a business model is managing channel conflicts. When more than one channel competes for the same customers there is a high chance of channel conflict (Bucklin, Thomas-Graham et al. 1997). An illustrative example is the one of the computer manufacture Compaq (now HP). When it started to copy Dell's direct channel strategy in the late 90's it drew a hostile reaction from its resellers, who correctly felt the company was competing with them. In 1999, the company's Board of Directors forced out CEO Eckhard Pfieffer, partially due to his inability to successfully balance the direct and indirect channels (HBSS 1999). In the record industry the majors, such as Sony Music, EMI or Warner Music long hesitated to introduce digital music distribution (e.g. online channels, MP3 players, in-store CD burning) because they were frightened of profit cannibalisation, channel conflict and illegal copying. Sony for instance, who disposes of a huge consumer electronics and a strong music department, could have easily introduced the MP3 player. These tiny walkman-like devices are capable of storing and playing the popular digital music format MP3. But Sony was not favourable to the proliferation of its content in a portable digital form and thus let the MP3 player market to be dominated by small start-up firms. The record companies' hesitation to act on the Internet was an even bigger disaster, because through their initial indecision to introduce a viable online distribution channel the market was soon dominated by free music trading platforms, like the infamous Napster. Though record companies avoided channel conflict between an online

channel and their traditional distribution system (i.e. retailing) and though they escaped from cannibalising their royal offline profits, their inaction was short-sighted. Many consumers got used to the free (illegal) content on the diverse online music trading platforms, because the majors long offered no appropriate alternative. Clearly, evaluating the trade-off between channel conflict, cannibalisation and introducing new channels is a difficult task.

4.3.8 Relationship Element

The fourth element of the business model ontology concerns the relationships a company builds with its customers. All customer interactions between a firm and its clients affect the strength of the relationship a company builds with its customers. But as interactions come at a given cost, firms must carefully define what kind of relationship they want to establish with what kind of customer. Profits from customer relationships are the lifeblood of all businesses. These profits can be achieved through the acquisition of new customers, the enhancement of profitability of existing customers and the extension of the duration of existing customer relationships (Grant and Schlesinger 1995).

Companies must analyze customer data in order to evaluate the type of customer they want to seduce and acquire, are profitable and worth spending retention efforts and are likely to be subject to add-on selling (Blattberg, Getz et al. 2001). Then firms must define the different mechanisms they want to use to create and maintain a customer relationship and leverage customer equity. This means using relationship mechanisms to optimize the acquisition, the retention of, and selling of additional products to a firm's customers, and the maximization of the value to the company of the customer relationship throughout its life cycle (Blattberg, Getz et al. 2001). The trend to move from simple transactions to more complex customer relations makes sense, since an arsenal of new ICT tools has made this possible at reasonable costs. The notion of the customer life time value (LTV) reflects this desire to leverage customer acquisition investments by building up long-term customer relationships.

Name of BM-Element	**RELATIONSHIP**
Definition	The RELATIONSHIP element describes the relationship a company establishes with a target CUSTOMER SEGMENT. A RELATIONSHIP is based on customer equity and can be decomposed into several RELATIONSHIP MECHANISMs.
Part of	CUSTOMER INTERFACE
Inherits from	relationship MECHANISM
Related to	A RELATIONSHIP promotes a VALUE PROPOSITION (1-n) A RELATIONSHIP is maintained with a TARGET CUSTOMER (1-n)
Cardinality	1-n
Attributes	CUSTOMER EQUITY {ACQUISITION, RETENTION, ADD-ON SELLING} All other attributes are inherited from the RELATIONSHIP MECHANISM (section 4.3.9)
References	(Blattberg, Getz et al. 2001)

Table 27: Relationship

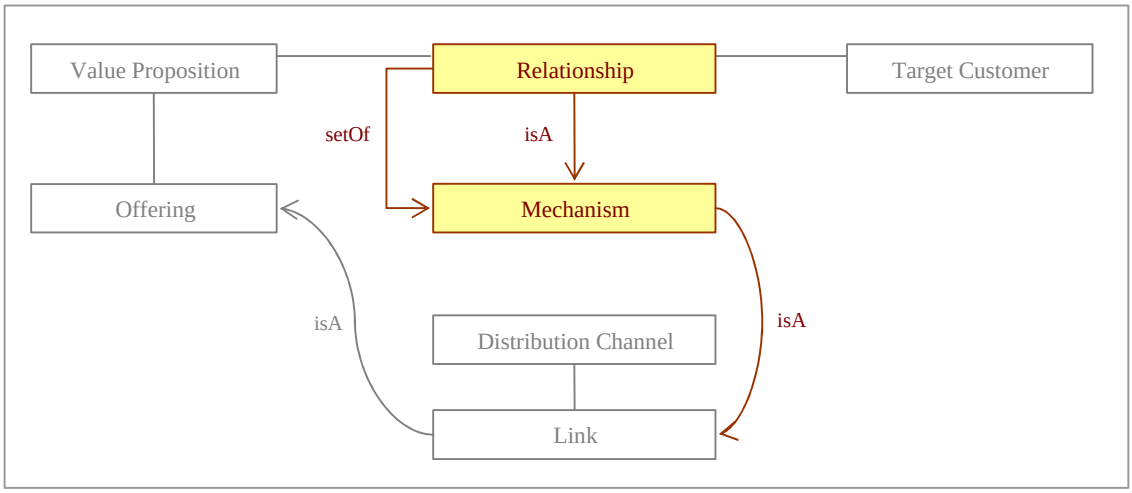


Figure 37: Relationship

CUSTOMER EQUITY: I classify relationships according to their customer equity goals, which are acquisition, retention, add-on selling (Blattberg et al., 2001).

{Acquisition}

It's very straightforward to say that companies must acquire customers to do business. Even firms with high retention rates lose customers and thus must continuously acquire new customers to stay in business. Because customer acquisition is a very expensive affair and because the relationship developed during the acquisition phase strongly influences retention and add-on selling it must be carefully managed and evaluated. Take the acquisition race at the summit of the dotcom euphoria as a bad example. Believing that market share was the main driver of success, dotcom companies spent enormous sums for, admittedly innovative, but exaggerated customer acquisition. Huge advertising budgets, plenty of giveaways and massive product subsidies were common. However, success did not occur for lack of customer focus and integration in the overall relationship strategy. Generally it can be said that customers lured with low prices or initial price reductions have a low retention rate, show little loyalty and leave at even small price increases. A more subtle acquisition strategy is to attract customers with a low price good and earn money on frequently purchased components or complementary goods and services. The Gillette Company, for example, earns most money on their relatively expensive disposable razor blades and not on the razor itself. Hewlett Packard sells very cheap inkjet printers and makes money from ink cartridges. Many mobile phone operators subsidize new and expensive mobile phone models to make them affordable to customers and cash in on the new services they can sell them (e.g. data and multimedia services).

{Retention}

The goal of customer retention is to leverage customer acquisition investments. Because customer acquisition is normally more expensive than retention it makes sense to find ways and mechanisms to extend the duration of the relationship between firm and customer. Of course the focus must be set mainly on the most profitable customers. But this is still not as self-evident as it sounds: Most retailers focus their marketing on driving traffic into their stores by using hot promotions, even though the majority of their profits come from a small fraction of their customers. Blattber, Getz et al. (2001) mention the following drivers that affect customer retention: customer expectation versus delivered quality, the value of the good or service, product uniqueness and suitability, loyalty mechanisms, ease of purchase, customer service and ease of exit. In this model I only consider the mechanisms that can be directly assigned to retaining

customers, such as loyalty programs, customer defection programs or installing switching cost. The best known example of a retention strategy in the market is probably the frequent flyer miles which airlines award their customers with.

Increasingly, customer retention is also influenced by switching costs. In other words, the costs of terminating a relationship and building a new one have an influence on customer defection. When General Electric offered their airline customers to not only deliver airplane engines, but to take charge of every aspect of their customers airplanes, they did nothing else than locking them in. Admittedly, the airlines were freed from airplane maintenance, but became dependant of General Electric. An example of switching costs in the B2C market are personalized websites. Amazon.com offers its customers personal wish lists, personalized book recommendations based on their purchase history and other features that they cannot export to another book vendor. If a customer switches suppliers he is forced to rebuild all this information.

{Add-on selling}

Add-on selling is the activity associated with selling any additional products and services to current customers (Blattberg, Getz et al. 2001). These products can, but do not necessarily have to be related to each other. getAbstracts.com, a start-up that sells abstracts of business books online allows its customers to purchase these books directly over their website. Telecommunication companies and recently also mobile phone operators try to increase their revenues by selling their existing customers additional data services. When the Swiss financial corporation Credit Swiss Group acquired the Winterthur insurance company its goal was to exploit synergies by selling its banking customers insurance contracts.

4.3.9 Mechanism element

The relationship MECHANISM is part of a RELATIONSHIP. It is a specific mechanism that has a function in relationship building with a company's customers. They contribute to personalization, trust and brand building.

Name of BM-Element	**relationship MECHANISM**
Definition	A RELATIONSHIP MECHANISM is part of a RELATIONSHIP and describes the function it accomplishes between the company and its customers. It may also be a channel LINK or a part of the VALUE PROPOSITION.
Element of	RELATIONSHIP
Inherits from	LINK
Cardinality	0-n
Attributes	Inherited from LINK (section 4.3.5) *FUNCTION* {PERSONALIZATION, TRUST, BRAND}

Table 28: Mechanism

***REASONING (inherited from* LINK)**: Similar to the reasoning on OFFERINGs a relationship MECHANISM can (but does not necessarily have to) contribute to value creation in three distinct ways: either through *use*, reducing *risk* or reducing a customer's *efforts*.

FUNCTION : This attribute describes which function the relationship MECHANISM fulfills. It can either personalize a relationship, contribute to customer trust, or contribute to brand building.

{Personalization}

Historically, vendors had a personal relationship with their customers. The typical example is the Mom and Pop grocery store where the shopkeeper knows every client personally and is familiar with his needs and habits. But these shops have made way to bigger and impersonal urban stores

with a larger trading area and thousands of employees. Because of their size, lower employee-to-customer ratios and high turnover among employees it has become impossible for most companies to maintain one-to-one human relationships with their customers. ICT now allows companies to re-introduce a more personalized relationship with their customers at a reasonable cost. Many firms have established information strategies to gather and exploit knowledge about their customer in order to personalize interactions. Customer profiles with historical buying behavior, tastes and needs and their contact history with the firm are stored in large databases. This data can then be used to simulate a kind of Mom and Pop store relationship, where the customer has the impression to be known personally to the firm with all his needs and preferences. But personalization does not necessarily mean a one-to-one relationship. Rather it could mean personalizing for a group of customers with common characteristics, which is known as one-to-tribe marketing. The choice between one-to-one and one-to-tribe depends on the relationship a company wants to establish and the cost factor.

The personalized approach I tackle in this section is comparable to the mass customization approach in the value creation process of the value proposition (see 4.2.2). Whereas mass customization is more product related and tied to mass industrialized production tailored to the customer's wishes, personalization is more about customizing marketing, services and supplementary offers to the core value proposition.

An important field of personalized mechanisms is one-to-one marketing. This is nothing else than tailoring marketing activities to specific customers, their needs, behavior and their particular transaction history. Of course a company must be able to collect or posses enough customer information before it can enter into a real one-to-one relationship with its clients. Pine II, Peppers et al. (1995) call this a learning relationship - an ongoing connection that becomes smarter as the two interact with each other, collaborating to meet the customer's needs over time. In good hotels or restaurants it is common to reward loyal customers with their favorite table or a welcome gift in the room. Airlines know when a frequent first class flyer enters an airplane and a stewardess welcomes him personally. But things could go much further. Imagine an airline customer that by accident has taken two delayed flights the same week. Wouldn't he be pleased if the airline were able to detect this incidence and address him personally with an excuse letter or maybe even a goodie? This would certainly have important impacts on customer loyalty and thus improve the bottom line.

Another example of a personalized customer relationship are product recommendations to specific customers. This becomes possible through so-called recommending systems, which are based on attributes, item-to-item correlation or user-to-user correlation (Schafer, Konstan et al. 2000). The first technique is based on a set of rules that makes recommendations derived from a customer's profile of attributes. An online music store that learns that a particular customer only buys discounted CD's may offer him price reductions the next time he surfs the Website. The second technique identifies items frequently found in association with items in which a customer has expressed interest. The third technique, also known as collaborative filtering and to date the most powerful method (Sarwar, Karypis et al. 2000), recommends products to a customer based on the correlation between his profile and other customers who have a similar purchase behavior.

The problem of true personalization is that it requires the integration of several information sources spread across the company. Collecting and combining real-time information from sales, marketing and service channels in order to better serve the customer is a problem that most industries are still working on.

{Trust}

In business a certain level of trust between economic agents is indispensable so that business can take place. "Trust of a party A in a party B for a service X is the measurable belief of A in that B

will behave dependably for a specified period within a specified context" (Dimitrakos 2001). This shows that the notion of expectation is central to the concept of trust (Jones 2002). Traditionally, trust has been based on identity, assumed quality or the perception of risk and it deepens over the time of a relationship (Daignault, Shepherd et al. 2002). But in a business environment that has become increasingly global, transactions more and more virtual and where the implicated parties do not necessarily know each other anymore before conducting business, new trust mechanism have gained importance. ICT offers a large range of innovative or improved mechanisms to build trust in e-business environments (Friedman, Kahn et al. 2000) by improving the expected output of a transaction (cf. Illustration Box 5).

Especially the role of reputation has received a boost through ICT. The large body of literature on this subject shows how reputation is based on communities, dedicated reputation systems or third parties. Take, for instance, virtual communities. They are a powerful but two edged instrument of trust. Besides content officially published by a company, the members of a virtual community of transaction compare and aggregate their experiences and thus give a perspective independent of vendors and advertisers (Hagel and Armstrong 1997; McWilliam 2000). However, companies have a very limited direct influence on virtual communities and often fear their power. A quite similar mechanisms of trust is the survey of a company's performance history stored in so-called reputation systems (i.e. the accumulated feedback of second parties). Third parties can also play an important role in providing trust mechanisms as long as they are perceived as trusted and independent. They can offer so-called labeling services, such as the TRUSTe's Privacy Seal (McKnight, Choudhury et al. 2000), certification services as provided by VeriSign, or authorization and verification services. Further, similar to second party reputation systems third party ratings are also a trust mechanism that receive much attention by customers. SmartMoney.com, the online branch of the well-known investor's magazine provides annual ratings of online and offline brokers and a tool called "broker meter" that will show you how fast your broker's site is compared to other brokers.

More traditional instruments to establish trust are mediation services in case of disputes or insurance guaranties to prevent financial loss. Further, technology also plays an important role in establishing trust. Often it is perceived to be either secure or insecure and accordingly has an impact on the trust a customer will have in a company or a service. For a very long time customers were reluctant to use the Internet for transaction purposes because it was perceived as an insecure technology.

Trust mechanisms at eBay.com

eBay is an online auction and trading platform in which buyers and sellers are brought together to buy and sell items such as antiques, computers, stamps and toys, but also business and industrial goods. In 2002 the company had earnings of over 1 billion dollars and an income of almost 190 million dollars. A part of its business model are the mechanisms to establish trust which are crucial for such a virtual platform where buyers and sellers have never done business before. Therefore eBay has installed a range of state-of-the-art trust mechanisms under the so-called SafeHarbor program:

Feedback Forum. Every eBay user has a Feedback Profile made up of comments from other eBay users and allows to check the "reputation" or business practices of any buyer or seller at eBay.

Escrow Service. This is a service co-offered with Escrow.com that protects both buyer and seller by acting as a trusted third-party during the transaction, which manages the payment process from start to finish.

Fraud Protection Program. eBay users are covered for up to $200 on most items for free. Further, the company works closely with their community of members to ensure a safe trading environment.

ID Verify. This is a mechanism that verifies the identity of a user and helps others trust him as their trading partner. The verification is based on personal information that is cross-checked against consumer and business databases for consistency.

Authentication Services. Authentication helps to find out whether an item is genuine based on an independent authenticator's physical inspection. The service is co-offered through authentication companies listed on the website.

Verified Rights Owner (VeRO). eBay's Verified Rights Owner (VeRO) Program ensures that items listed for sale do not infringe upon the copyright, trademark or other intellectual property rights of third parties.

Online Dispute Resolution (ODR). This is an independent service co-offered with Square Trade that provides a neutral place to work out disputes online efficiently and effectively.

eBay Payments Policy. eBay offers buyers full purchase protection for both credit card and electronic check payments. Sellers are also protected from chargeback resulting from fraudulent transactions.

Illustration Box 5: Trust at eBay

{Brand}

Brands constitute a pivotal resource for generating and sustaining competitive advantage (Aaker 1989). They are an important part of relationship building and help creating a distinction among entities that may satisfy a costumer's need (Berthon, Hulbert et al. 1999). When designing business models companies should have a clear brand identity with depth and textures so that those designing and implementing the communications programs do not inadvertently send conflicting or confusing messages to customers (Joachimsthaler and Aaker 1997). Some even compare a brand identity and can be compared to the identity of a person. For instance, Absolut vodka personified tends to be described as a cool, hip, contemporary 25-year old (Aaker 1997).

A brand is influenced by every interaction with a customer or with a firm's environment. This includes transactions, marketing, public relations and generally its behavior in society. For the purpose of the ontology I understand brand mechanisms as specific actions that are devoted to identity and brand building.

Brand building

When Nestlé acquired Buitoni, an old Italian pasta company and brand, they used a set of innovative brand building mechanisms to expand in the United Kingdom pasta market, where consumers did not seem to have a wide variety of pasta recipes in their repertoires (Joachimsthaler and Aaker 1997). They challenge was to expand consumers' use of the product, but in a way that benefited its own brand and not its competitors' brand. Buitoni achieved this by establishing the Casa Buitoni Club that was positioned as a helpful authority on Italian food to which consumers could turn for advice on the many varieties of pasta and their preparation.

Nokia, the Finnish mobile phone manufacturer, established a strong brand in the mobile phone market. The brand is an important but not the most important part of Nokia's business model. The company contributes to its image of a young and dynamic innovator by sponsoring such events as the Nokia Snowboard FIS World Cup tour or sponsoring a number of top-ranked beach volleyball professionals. But Nokia also uses ICT for branding proposes. Owners of a Nokia phone can join the Club Nokia online by entering their serial number and then benefit from games, cartoons, movies, images and ring tones. Nokia's branding strategy proved to be very successful resulting in a No.6 ranking in Interbrand's year 2002 list of the world's top 100 brands (Bensinger 2003).

Illustration Box 6: Brand building at Nestlé and Nokia

CUSTOMER BUYING CYCLE (inherited from* LINK*): If a relationship MECHANISM is also a channel LINK it inherits the *customer buying cycle* attribute.

VALUE LIFE CYCLE (inherited from* LINK*)

If a MECHANISM is also a part of the VALUE PROPOSITION the attribute *value life cycle*, overwrites the attribute customer buying cycle.

VALUE LEVEL and PRICE LEVEL (inherited from* LINK*)

These two attributes are inherited from the LINK element.

4.3.10 Mini-Case Orange

In this section I apply the relationship elements outlined in the previous lines to a mini-case in the mobile phone industry. Orange is one of the three mobile telecommunication operators in Switzerland and is a 100% subsidiary of France Télécom. With about 1'600 employees, 78 points of sale and its Network that covers 98% of the Swiss population it makes a turnover of CHF475 million and an EBIDTA of CHF33 million. Besides building and maintaining its networks, managing customer contracts belongs to Orange's main business tasks. In the following I outline a part of the company's relationship strategy in acquisition, retention and add-on selling by using the framework described in this chapter. The case is illustrated in Figure 38. The columns represent the RELATIONSHIP MECHANISMs of Orange and the lines represent their attributes, the related CHANNELS and TARGET CUSTOMERs. It remains to be said that besides the elements outlined below, Orange maintains a number of sponsorships, such as OrangeCinema, OrangeOpera and HandyHero in order to contribute to brand building.

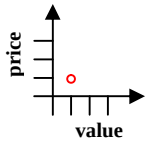
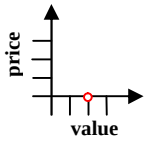
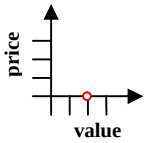
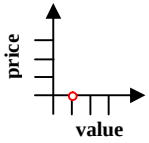
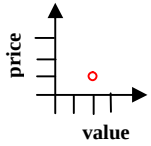
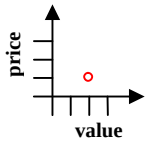
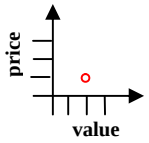
Customer Equity	**{Acquisition}**			**{Retention}**	**{Add-on selling}**		
Relationship description	Orange tries to make new phone models affordable and tries to be present in the market as a young brand for communicating human emotions.			Orange rewards loyalty and communications of its customers with points, which can be used to buy a new mobile phone or pay bills.	Orange tries to make customers use data services, such as WAP, SMS and MMS as much as possible (especially teenagers).		
Name of the relationship mechanism	Phone subsidies	Orange World portal	Habbo Hotel	Loyalty points	Location based services	SMS Publisher	Orange Heartbreak
Relationship mechanism description	Orange pays a part of or the whole price of a new phone a customer wants to buy in exchange for a 12-month contract with Orange	A portal that provides a mixture of news, sports, entertainment and mobile phone features, such as games. Customer login for Orange phone account management	A virtual meeting place with public and private rooms where people can gather and chat, handle e-mail, instant messages and SMS'	-	Location based services for places of interest, route planning, traffic and cinema guides	A tool that allows customers to create their own SMS-channel to send information to channel-subscribers	SMS-based services that allow (teen) customers to flirt anonymously by using their mobile phone
Reasoning	{Risk}: Minimizes the risk to be stuck with an expensive phone that is soon outdated. {Use}: Customers can afford the newest mobile phones with the newest phone features (e.g. MMS)	{Use}: Provides customers and prospects with an information portal and mobile entertainment services. Allows customers to manage their phone account	{Use}: Provides potential (teen) customers with a place to hang out and manage their e-mail, instant messages and SMS'.	{Risk}: Minimizes the risk to be stuck with an expensive phone that is soon outdated. {Use}: Customers can afford the newest mobile phones with the newest phone features (e.g. MMS)	{Effort}: minimizes the efforts for finding useful and location-based information	{Use}: Allows customers to send information to a list of people that are interested in the same topics (e.g. info for the members of a hobby soccer team)	{Use}: Allows teenagers to resolve the most pressing problems of their age - love issues – without losing their face.
CBC	{Evaluation}	{Awareness}	{Awareness}	{After Sales}	{After Sales}	{After Sales}	{After Sales}
Value level/ price level							
Function	-	Brand	Brand	-	Personalization	Personalization	-
Channel	Orange shops Retailers	Internet	Internet	-	Mobile phone	Mobile phone Internet	-
By Actor	Self	Self	Self	Self	Self (& with partners)	Self	Self
Target customer	All prospects	Customers and prospects	Teen customers and prospects	All current customers	Nomad customers	Active teen customers	Teen customers

Figure 38: Customer Interface at Orange Switzerland

4.4 INFRASTRUCTURE MANAGEMENT

The Infrastructure Management pillar is about the *how* a company creates value. It describes what abilities are necessary to provide its VALUE PROPOSITIONs an maintain its CUSTOMER INTERFACE. Infrastructure Management outlines the value network that generates economic value through complex dynamic exchanges between one ore more enterprises, its customers, suppliers, strategic partners and the community (Allee 2000). In other words, this pillar specifies the business model's capabilities and resources, their owners and providers, as well as who executes which activity and how they relate to each other. As linkages between companies are more and more electronic, the members of a network are flexible in coordinating schedules, sharing assets, utilizing each other's competencies and resources, and they develop, pursue and close business together (Andrews and Hahn 1998). The ultimate goal from a senior management's perspective would be a company with plug-and-play characteristics. From their point of view they should be able to divest themselves of one business and plug in another one without rebuilding all the reporting and administrative system (Herman 2002).

Definition: INFRASTTRUCTURE MANAGEMENT describes the value system configuration (Gordijn, Akkermans et al. 2001) that is necessary to deliver the value proposition and maintain customer interfaces. This comprises the VALUE CONFIGURATION of the firm, in other words the activities to create and deliver value, and, the relationship between them, the in-house CAPABILITYies and those acquired through the firm's PARTNERSHIP network (see Figure 39).

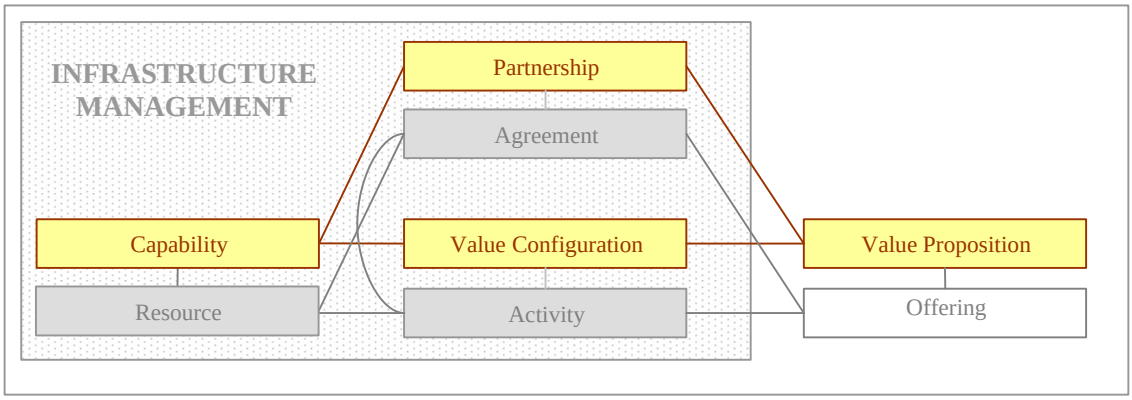


Figure 39: Infrastructure Management

4.4.1 Capability Element

CAPABILITY is the fifth element of the business model ontology. Wallin (2000) describes capabilities as repeatable patterns of action in the use of assets to create, produce, and/or offer products and services to the market (cf. Theory Box 5). Thus, a firm has to dispose of a set of CAPABILITYies in order to provide its VALUE PROPOSITION. These capabilities depend on the assets or resources of the firm (Bagchi and Tulskie 2000). And, increasingly, they are outsourced to partners, while using e-business technologies to maintain the tight integration that is necessary for a firm to function efficiently. In other words, ICT has made it possible for companies to "unbundle" and outsource capabilities and resources that do not belong to their core competencies (Hagel III and Singer 2000). Reflecting on core capabilities helps companies streamline their organization and build competitive advantages (cf. Illustration Box 7).

Name of BM-Element	CAPABILITY
Definition	A CAPABILITY describes the ability to execute a repeatable pattern of actions. A firm has to dispose of a number of CAPABILITYies to be able to offer its VALUE PROPOSITION. CAPABILITYies are based on a set of resources from the firm or its PARTNER(s).
Part of	INFRASTRUCTURE MANAGEMENT
Inherits from	RESOURCE
Related to	A CAPABILITY(ies) allows a firm *to provide* its VALUE PROPOSITION (0-n)
Set of	RESOURCE(s) (0-n)
Cardinality	1-n
Attributes	Inherited from RESOURCE (section 4.4.2)
References	(Wallin 2000) (Bagchi and Tulskie 2000)

Table 29: Capability

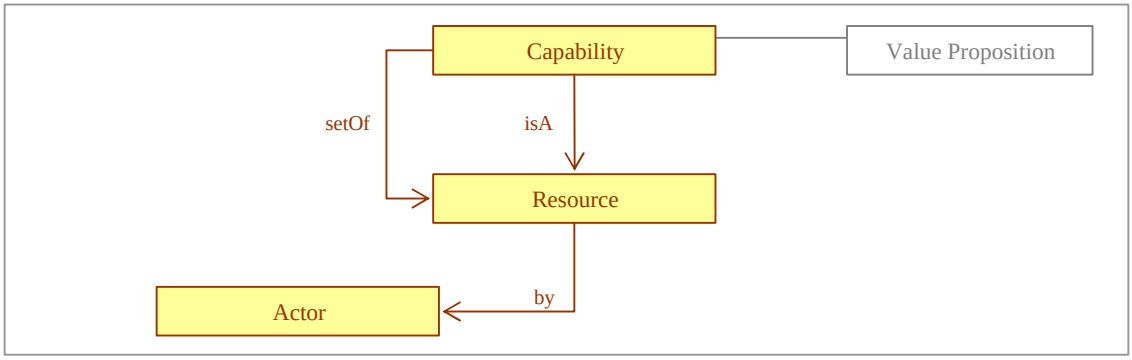


Figure 40: Figure Capability

CAPABILITYies and RESOURCEs are either assured in-house or can involve outside ACTORs (Table 30) with whom a firm enters a PARTNERSHIP and signs an AGREEMENT (see section 4.4.6 for more details on partnering) to provide a specific business service.

Name of BM-Element	ACTOR
Definition	A business model ACTOR is an outside organization that is involved in the firm's business model and is integrated through a partnership.
Attributes	*NAME* {abc} *DESCRIPTION* {abc}

Table 30: Business model ACTOR

Core Capabilities at Dell and easyJet.com

The core capabilities of the IT retailer Dell concern two domains, which are supply chain excellence and 360 degree mastery of the customer relationship over the Internet or through the call center. The former allows the company just-in-time delivery of required components, build-to-order production and thus low stocks and consequently competitive prices. The latter is crucial because Dell does not dispose of a dealer network and for cost reasons only makes use of direct channels to sell its product. If it does not excel in customer relationships it has no possibility to reach, gain or retain customers. The core capabilities of EasyJet.com are the maintenance of a cheap fleet of airplanes with high air time and the ability to fill airplanes. Both allow EasyJet.com to provide its main offering of relatively low airfares.

Illustration Box 7: Core Capabilities

Capabilities (Wallin 2000)

In his value creation framework Wallin categorizes a firm's business capabilities among two axes, which are internal-external and resources-customers.

External

Resources	Customer
Resource-integration Capabilities Refers to the capability to deploy firm-addressable assets and capabilities inside and outside the boundaries of the firm. The resource-integration capability can be divided into internal integration and external integration	Customer-interaction Capabilities Is the capability to listen to and understand the customer, as well as the ability to communicate to the customer the value-creation possibilities of the firm, and to do so over long periods of time
Generative Capabilities Is the ability to create new bundles of product traits that constitute firm-specific competences. Two important features of generative capability can be identified, innovation and execution.	Transformative Capabilities Refers to the ability to combine bundles of product traits that in terms of physical, service and people content have the threshold traits required by each customer and which can be offered at costs less than their perceived value-creating potential

Internal

Theory Box 5: Capabilities (Wallin 2000)

4.4.2 Resource Element

In order to create value, a firm needs resources (Wernefelt 1984). In this regard Grant (1991) distinguishes between tangible and intangible assets and people-based skills. Tangible resources include plants, equipment and cash reserves. Intangible resources include patents, copyrights, reputation, brands and trade secrets. Human resources are the people a firm needs in order to create value with tangible and intangible resources.

Name of BM-Element	RESOURCE
Definition	RESOURCEs are inputs into the value-creation process. They are the source of the CAPABILITIES a firm needs in order to provide its VALUE PROPOSITIONs.
Element of	CAPABILITY (1-n)
Related to	A RESOURCE can be provided *by* an ACTOR (0-n) A RESOURCE *{fits}, {flows} to or is {shared}* by one or several ACTIVITYies (0-n)
Cardinality	0-n
Attributes	***NAME*** {abc} ***DESCRIPTION*** {abc} ***RESOURCE TYPE*** {TANGIBLE, INTANGIBLE, HUMAN}
References	(Grant 1991) (Wernefelt 1984)

Table 31: Resource

RESOURCE TYPE: I classify the groups of resources a firm or its partners dispose of among three rough categories, namely, tangibles, intangibles and people-based skills.

{Tangible}.

This category concerns the most conventional resources, such as plants and equipments. These resources traditionally appear in a company's balance sheet. For instance, easyJet.com's main tangible assets are 64 Boeing 737 (and soon 120 Airbus A319) that allows it to keep its fleet costs low (easyJet.com 2002).

{Intangible}.

This group of resources concerns a category that has gained importance over the last decades. Even though they are difficult to evaluate and accountants are sometimes reluctant to put them on the balance sheet, it is undeniable that patents, brands and similar resources are of immense value to the contemporary firm. The Finnish cellular phone manufacturer Nokia has emerged as one of the strongest brands of the world and uses this asset to further consolidate its competitive position.

{Human}.

Depending on the type of firm people-based skills are of crucial value. Examples include consultancies, hospitals, universities and firms that rely on innovation. The Swiss pharmaceutical company Novartis and its competitors base their competitive advantage on the ability of their research teams to create new products, which are protected by patents and generate high margins. The American chip manufacturers Intel and its competitor AMD both rely on huge teams of scientists in order to win the Sisyphus-like "race" of providing the consumer market with the "fastest" computer processor.

RELATED TO ACTIVITY: A RESOURCE relates to one or several ACTIVITYies. Their linkages have a specific nature. I distinguish between fit, flow and shared (based on (Malone and Crowston 1999)).

{Fit}

A RESOURCE fits an ACTIVITY when an ACTIVITY requires more than one RESOURCEs (cf. Figure 41).

{Flow}

A RESOURCE flows to an ACTIVITY when a ACTIVITY requires one RESOURCE (cf. Figure 41).

{Shared}

A RESOURCE is shared by an ACTIVITY when it serves more than one RESOURCEs (cf. Figure 41).

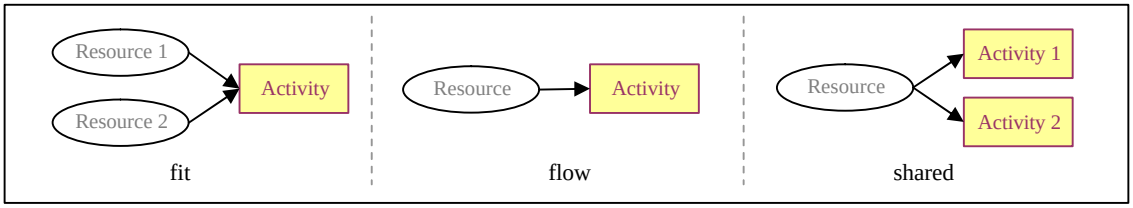


Figure 41: fit, flow or share an ACTIVITY

4.4.3 Value Configuration Element

The VALUE CONFIGURATION is the sixth element of the business model ontology. As outlined above, the main purpose of a company is the creation of value that customers are willing to pay for. This value is the outcome of a configuration of inside and outside activities and processes. The VALUE CONFIGURATION shows all activities necessary and the links among them, in order to create value for the customer. To define the value creation process in a business model, I use the *value chain framework* (Porter 2001) and its extension, such as defined by Stabell and Fjeldstad (1998). These two authors extend the idea of the value chain with the *value shop* and the *value network*. The former describes the value creation process of service providers (e.g. consultancies), whereas the latter describes brokering and intermediary activities (e.g. banks and telecommunication companies). It is in this component of the e-business framework that I describe such activities as Supply Chain Management (SCM), Efficient Customer Response (ECR), or e-procurement.

Name of BM-Element	**VALUE CONFIGURATION**
Definition	The VALUE CONFIGURATION of a firm describes the arrangement of one or several ACTIVITY(ies) in order to provide a VALUE PROPOSITION.
Part of	INFRASTRUCTURE MANAGEMENT
Related to	The VALUE CONFIGURATION relies on a set of CAPABILITIES (1-n) The VALUE CONFIGURATION makes VALUE PROPOSITIONs possible (1-n)
Set of	ACTIVITYies
Cardinality	1-n
Attributes	*CONFIGURATION TYPE* {VALUE CHAIN, VALUE SHOP, VALUE NETWORK} Other attributes inherited from ACTIVITY (section 4.4.4)
References	(Porter 1985; 2001) (Stabell and Fjeldstad 1998)

Table 32: Value Configuration

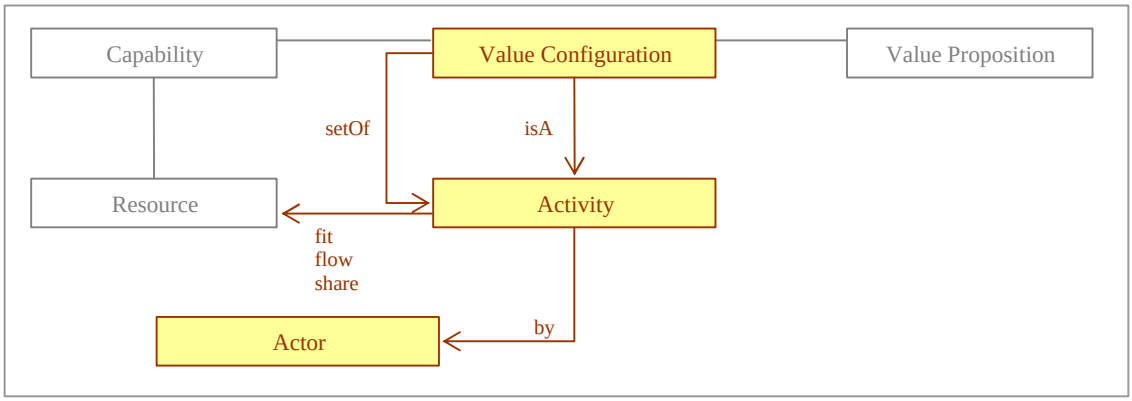


Figure 42: Value Configuration

CONFIGURATION TYPE: I distinguish between three basic value configuration types, which are the value chain (Porter 2001), the value shop and the value network (Stabell and Fjeldstad 1998).

{Value chain}

The value chain contains the different activities a firm performs to deliver low-cost or differentiated products. The main activities of the value chain framework (Porter 2001) include inbound logistics, operations, outbound logistics, marketing and sales, and service. The value creation logic of a value chain is the transformation of inputs into products. The main interactivity relationship logic is sequential (Stabell and Fjeldstad 1998).

{Value shop}

The value shop represents an extension to the value chain framework provided by (Porter 2001). Stabell and Fjeldstad (1998) argue that service provisioning has a different value creation logic than manufacturing. Service providers tend to come up with new solutions, rather than fixing on one solution and reproducing it time and again such as in the value chain. In this value configuration a firm concentrates on discovering what the client wants, figures out a way to deliver value, determines whether the customer's needs were fulfilled and repeats the process in an iterative way if necessary. The proposed main activities of a value shop contain problem finding and acquisition, problem solving, choice, execution and control and evaluation. The value creation logic of a value shop is resolving customer problems. The main interactivity relationship logic is cyclical (Stabell and Fjeldstad 1998).

{Value network}

In the value network value is created by linking clients or customers who are or wish to be interdependent. The firm itself is not the network, but it provides a networking service (Stabell and Fjeldstad 1998). Afuah and Tucci (2001) see the value network as a direct outgrowth of brokering. According them authors this is the value configuration that exists when a firm is an intermediary, such as a broker or a market maker. Rather than focusing on logistics such as the importation and delivery of raw materials and how they are transformed into finished goods, the intermediary must focus on network promotion and contract management, service provisioning and infrastructure operations. The value creation logic of a value network is linking customers. The main interactivity relationship logic is mediating (Stabell and Fjeldstad 1998).

4.4.4 Activity Element

Activities are at the heart of what a business does. They are actions a company performs in order

to create and market value and generate profits. An ACTIVITIY is executed by an ACTOR, which can be the firm or one of its partners. Activities relate to owned or partner RESOURCES and they are linked in a VALUE CONFIGURATION.

Name of BM-Element	**ACTIVITY**
Definition	An ACTIVITY is an action a company performs to do business and achieve its goals.
Element of	VALUE CONFIGURATION
Related to	An ACTIVITY is executed *by* an ACTOR (1-n) An ACTIVITY *{fits}, {flows} to or is {shared}* by one or several RESOURCE(s) (0-n)
Cardinality	0-n
Attributes	*NAME* {abc} *DESCRIPTION* {abc} *ACTIVITY LEVEL* {PRIMARY ACTIVITY, SUPPORT ACTIVITY} *ACTIVITY NATURE* (0-1) - for Value Chain {INBOUND LOGISTICS, OPERATIONS, OUTBOUND LOGISTICS, MARKETING AND SALES, SERVICE} - for Value Shop {PROBLEM FINDING AND ACQUISITION, PROBLEM SOLVING, CHOICE, EXECUTION, CONTROL AND EVALUATION} - for Value Network {NETWORK PROMOTION AND CONTRACT MANAGEMENT, SERVICE PROVISIONING, NETWORK INFRASTRUCTURE OPERATION}

Table 33: Activity

ACTIVITY LEVEL: I distinguish between the firm's primary and support activities (Porter 1985).

{Primary activity}

Primary activities are those that are involved in the creation of the value proposition and its marketing and delivery.

{Support activity}

Support activities are the underlying fundament that allow the primary activities to take place. This includes activities such as firm infrastructure, human resource management, technology development and procurement (Porter 1985).

ACTIVITY NATURE: The *ACTIVITY NATURE* describes the type of a primary activity and depends on the *CONFIGURATION TYPE* attribute in the VALUE CONFIGURATOIN element. The three types of configurations, value chain, value shop and value network have different primary activities.

Value chain (five primary activities, cf. Figure 43*)*

- {Inbound logistics}. Activities associated with receiving, storing, and disseminating inputs to the product.
- {Operations}. Activities associated with transforming inputs into the final product form.
- {Outbound logistics}. Activities associated with collecting, storing, and physically distributing the product to buyers.
- {Marketing and sales}. Activities associated with providing a means by which buyers can purchase the product and inducing them to do so.

- {Service}. Activities associated with providing service to enhance or maintain the value of the product.

In the value chain, firms create value by transforming inputs into more refined outputs. The process of value creation is sequential: value is added at each step (Fjeldstad and Haanaes 2001). Examples essentially concern production and manufacturing.

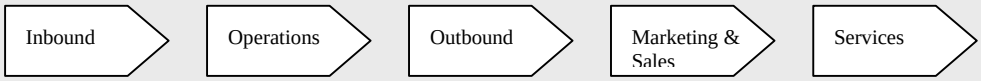
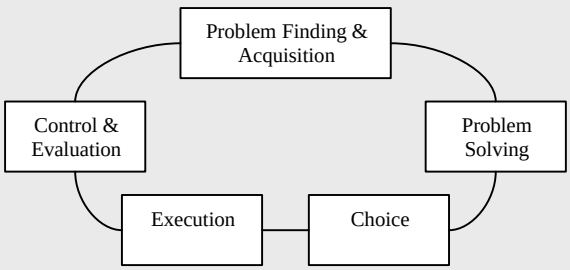


Figure 43: Value Chain

Value shop (five primary activities, cf. Figure 44*)*

- {Problem-finding and acquisition}. Activities associated with the recording, reviewing, and formulating of the problem to be solved and choosing the overall approach to solving the problem.
- {Problem-solving}. Activities associated with generating and evaluating alternative solutions.
- {Choice}. Activities associated with choosing among alternative problem solutions.
- {Execution}. Activities associated with communicating, organizing, and implementing the chosen solution.
- {Control and evaluation}. Activities associated with measuring and evaluating to what extent implementation has solved the initial problem statement.



The value shop creates value by solving unique problems for customers. Value creation is based on understanding a problem and finding a solution. In other words going from a present to a more desired state (Fjeldstad and Haanaes 2001). Examples include consultancies, doctors, venture capitalists and so on. Value shops sell competencies and approaches to help solve unique problems.

Figure 44: Value Shop

Value network (three primary activities, cf. Figure 45*)*

- {Network promotion and contract management} consists of activities associated with inviting potential customers to join the network, selection of customers that are allowed to join and the initialization, management, and termination of contracts governing service provisioning and charging.
- {Service provisioning} consists of activities associated with establishing, maintaining, and terminating links between customers and billing for value received. The links can be synchronous as in telephone service, or asynchronous as in electronic mail service or banking. Billing requires measuring customers' use of network capacity both in volume and time.
- {Network infrastructure operation} consists of activities associated with maintaining and running a physical and information infrastructure. The activities keep the network in an alert status, ready to service customer requests.

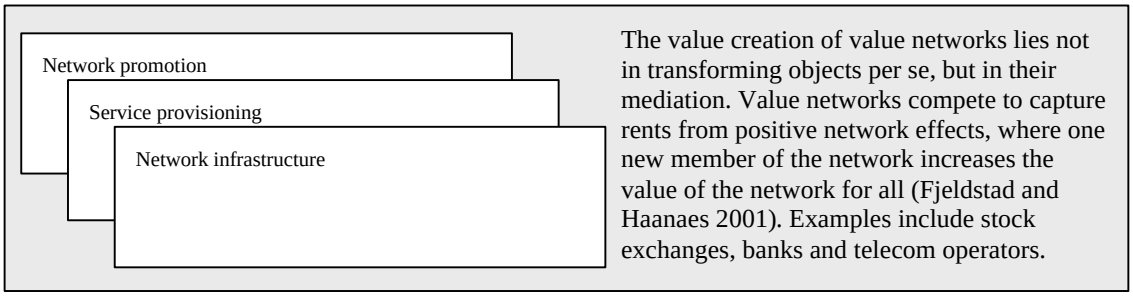


Figure 45: Value Network

RELATED TO RESOURCE: An ACTIVITY relates to one or several RESOURCES. Their linkages have a specific nature. I distinguish between fit, flow and shared (based on (Malone and Crowston 1999)).

{Fit}

An ACTIVITY fits a RESOURCE when a RESOURCE requires more than one ACTIVITY (cf. Figure 46).

{Flow}

An ACTIVITY flows to a RESOURCE when a RESOURCE requires one ACTIVITY (cf. Figure 46).

{Shared}

An ACTIVITY is shared by a RESOURCE when it serves more than one RESOURCEs (cf. Figure 46).

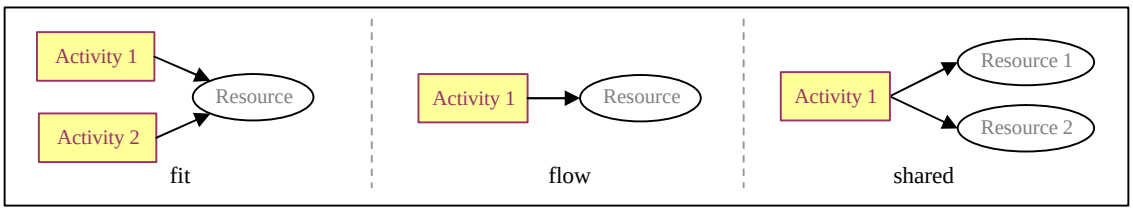
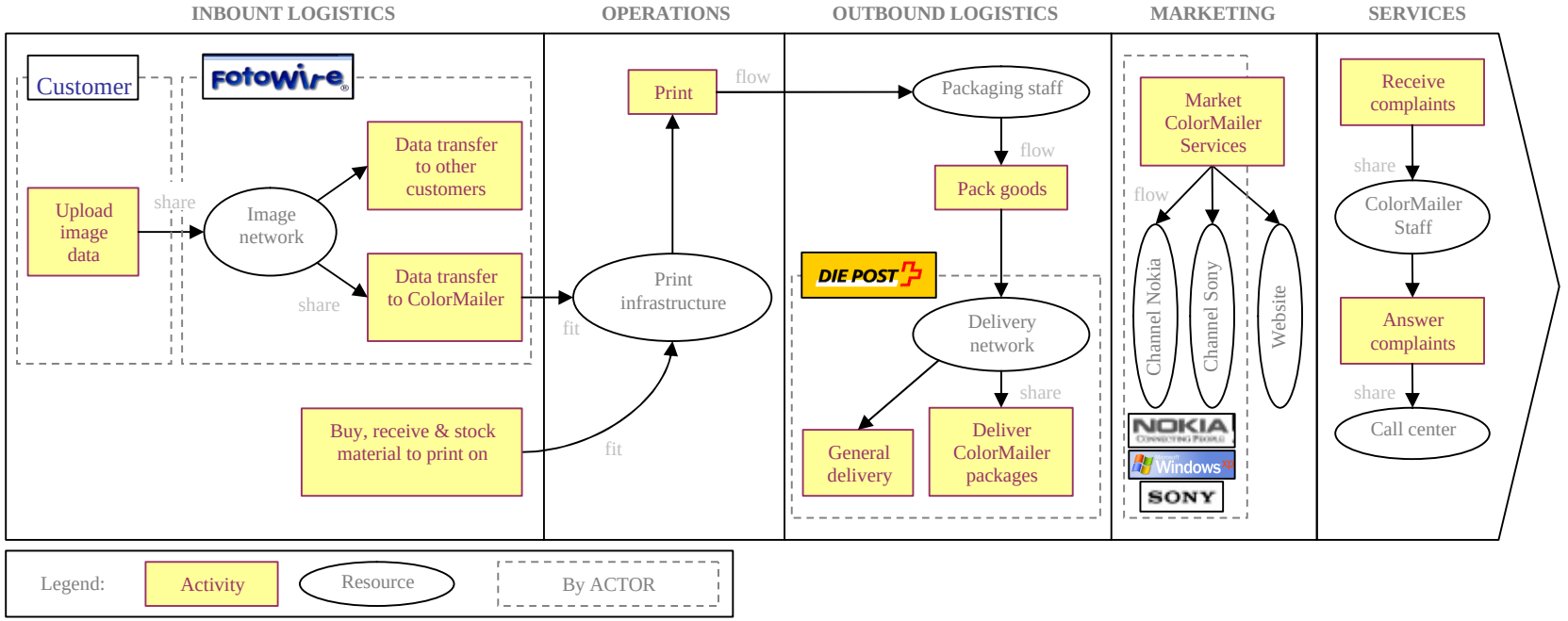


Figure 46: fit, flow or share a RESOURCE

4.4.5 Mini Case ColorPlaza

Before coming to the description of the next element I illustrate the VALUE CONFIGURATION, ACTIVITIES and RESOURCES through ColorPlaza, a Swiss company in the photography industry (see Figure 47). ColorPlaza let's their customers upload their digital photos over the Internet and get them printed on photo paper, t-shirts and other gadgets, which are then delivered directly to their homes. In fact, ColorPlaza was so successful with this service that it is now sold under the name of big partners, such as Sony Europe, Nokia or Microsoft (through the Windows XP operating system). These tight co-operations are based on a close integration of the information systems of the different partners involved.



Upload of digital images & order	Transfer of digital images to the printing facilities	Buy, receive & store material to print on	Print digital images on photo paper or goods	Pack goods for delivery	Deliver packages	Answer complaints	Sell ColorMailer services		ACTIVITY Name
The digital images have to be uploaded from the customer's camera or PC	The digital images have to be transferred from the customer to the printing facilities	The primary material to print on has to be received and eventually stored	The digital images have to be printed on either photo paper or goods, such as t-shirts, cups etc.	The order has to be packaged for home delivery	The orders have to be delivered to the customer's home	Possible complaints have to be answered to the customer's satisfaction	ColorMailer's services have to be marketed to potential customers		ACTIVITY Description
{Primary activity}	{Primary activity}	{Primary activity}	{Primary activity}	{Primary activity}	{Primary activity}	{Primary activity}	{Primary activity}		Level
{Inbound logistics}	{Inbound logistics}	{Inbound logistics}	{Operations}	{Outbound logistics}	{Outbound logistics}	{Services}	{marketing}		Nature
{Shares} image network	{Fits} print infrastructure	{Fits} print infrastructure	{Flows} to packaging staff	{Shares} delivery network	{Flows} to customer	{Shares} call center	{Flows} to channels		Related to RESOURCE
Customer	FotoWire	ColorPlaza	ColorPlaza	ColorPlaza	Postal service	ColorMailer	ColorPlaza		By ACTOR
							Sony	Nokia	
							Microsoft	Agfa	

Figure 47: ColorPlaza VALUE CONFIGURATION, ACTIVITIES and RESOURCES

4.4.6 Partnership Network Element

The seventh element of the business model ontology is the PARTNERSHIP NETWORK. A company's partner network outlines, which parts of the activity configuration and which resources are distributed among the firm's partners. In e-business literature there are several terms arising for these new forms of strategic networks in the value creation process, some call them b-webs (Tapscott, Lowi et al. 2000), or fluid and flexible organizations (Selz 1999), others call them value networks (Nalebuff and Brandenburger 1997). The appearance of such networks of firms in which market and hierarchical governance mechanisms coexist has significantly enhanced the range of possible organizational arrangements for value creation (Doz and Hamel, 1998; Gulati, 1998). In general, partnerships and alliances have become an essential component in the strategies implemented by most companies. Although they have been used by some firms for decades already, today's partnerships and alliances have changed in nature. The more traditional concepts of joint ventures (e.g. for penetration of new geographic markets) have made place to strategic alliances that aim at creating and enhancing the competitive positions of the firms involved, in a highly competitive environment (Dussauge and Garrette 1999). For decades already management literature has emphasized the importance of partnering and alliances and has produced a large body of literature from which I take two definitions. Gulati and Singh (1998) define alliances as any voluntarily initiated cooperative agreement between firms that involves exchange, sharing or co-development, and it can include contributions by partners of capital, technology, or firm-specific assets. Dussauge and Garrette (1999) add some elements by defining alliances as links formed between two - or more - independent companies which choose to carry out a project or specific activity jointly by coordinating the necessary skills and resources rather than pursuing the project or activity on their own, taking on all the risks and confronting competition alone or merging their operations or acquiring and divesting entire business units. To better understand co-operation and partnering Child and Faulkner (1998) propose drawing insights from economics, game theory, strategic-management theory, and organization theory.

Name of BM-Element	**PARTNERSHIP**
Definition	A PARTNERSHIP is a voluntarily initiated cooperative agreement formed between two or more independent companies in order to carry out a project or specific activity jointly by coordinating the necessary CAPABILITYies, RESOURCES and ACTIVITYies.
Part of	INFRASTRUCTURE MANAGEMENT
Related to	Concerns a VALUE CONFIGURATION (1-n) PARTNERSHIPS are developed to provid a VALUE PROPOSITION (1-n)
Set of	AGREEMENT(s)
Cardinality	0-n
Attributes	Inherited from AGREEMENT (section 4.4.7)
References	(Child and Faulkner 1998) (Dussauge and Garrette 1999) (Brandenburger and Nalebuff 1996) (Tapscott, Ticoll et al. 2000)

Table 34: Partnership

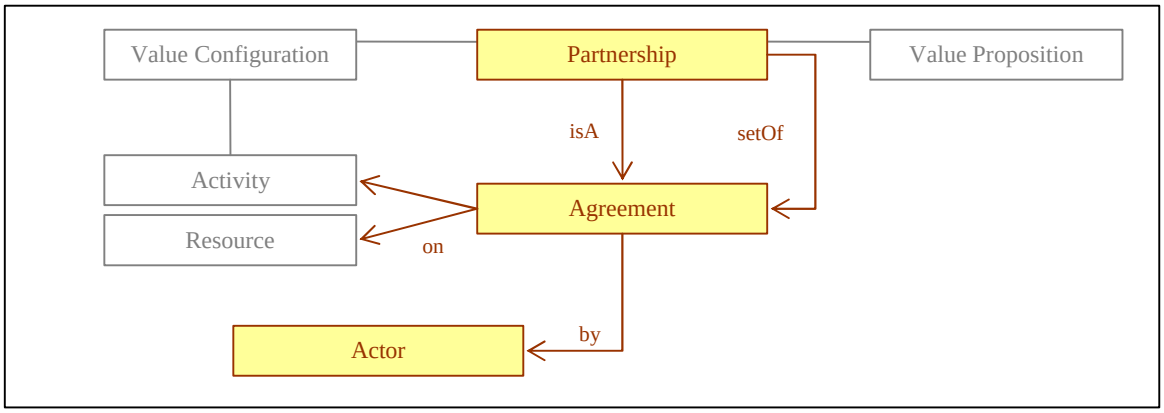


Figure 48: Partnership

The origins of partnering and alliances can be found in transaction cost economics (TCE) (Coase 1937; Williamson 1975). The basic idea behind TCE is that economic decisions can not be made on the basis of production costs alone, but companies must further consider the cost of transactions through the market or inside the company. This provides a powerful framework with which firms identify intermediary situations in which alliances are more efficient than either turning to the market or internalizing transactions (Dussauge and Garrette 1999). However, this perspective on partnerships puts the spotlight mainly on optimization through alliances where companies focus on their core competencies and rely on partner networks and outsourcing for other non-core competencies and activities (cf. Illustration Box 8).

Outsourcing in the financial sector

Many financial firms, such as GE Capital have outsourced activities covering finance and accounting or remote-marketing to places like India. GE Capital already employs 13'000 people there (Economist 2003). Standard Chartered, the largest foreign bank in India even wants to go a step further become the back office for many of the bank's operations in 56 countries. Evalueserve, an Indian company that was founded by former executives from McKinsey and IBM, provides research an analysis to banks, venture capitalists and consultants. SmartAnalyst, another Indian company, can already call four of the top ten American investment banks their clients for their tailored internet-based research service (Economist 2003).

Illustration Box 8: Outsourcing

A second perspective based on the so-called resource-based view of the firm highlights the contribution of partnering for acquiring resources that the firm does not possess. This may include such broad resources as a large customer database, a powerful brand name or simply patents and technology that a firm does not possess (cf. Illustration Box 9).

Partnering for customer acquisition

On the Internet or in the mobile phone industry content providers partner with portals respectively telecommunication operators because they have a large customer base. ColorPlaza, a Swiss provider of digital image printing services for amateur photographers, partners with powerful brands like Sony, Microsoft, Nokia and Agfa because of their brand name and their customer base.

Illustration Box 9: Acquiring resources

A third perspective on partnering and co-operation that is closely linked to the resource-base view focuses on organizational learning (cf. Illustration Box 10).

Partnering to acquire knowledge

General Motors and Toyota set up an alliance where they created a jointly owned plant in order to replicate Toyota's manufacturing system in the US market. One of the main objectives of the alliance was to transfer certain Japanese management skills to General Motors and, conversely, to help Toyota acquire knowledge about the US market (Dussauge and Garrette 1999).

Illustration Box 10: Organizational learning

A fourth perspective on partnering emphasizes the acquisition of markets, but also the creation from the scratch of completely new markets. Whereas the former, more traditional strategy has already been exploited for many years in the form of joint ventures to conquer foreign markets, the latter is rooted mainly in contemporary markets. Even partnering between competitors in order to create new markets or to achieve common standards is not uncommon today. This so-called co-opetition (Brandenburger and Nalebuff 1996) is a combination of competition and cooperation, which is linked to the increased risk and capital investments that characterize today's competitive landscape. Furthermore, because many of today's technologies are based on network externalities (Katz and Shapiro 1985) and the winner often takes all it is advantageous to form a consortia of partners (cf.. Illustration Box 11).

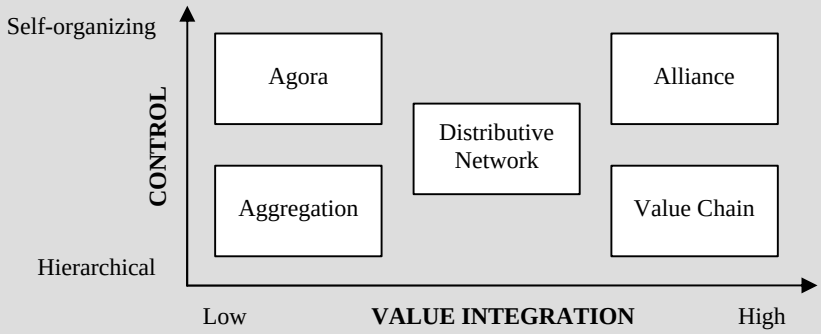
Partnering to share risks in developing new markets

Remember the video format Betamax that has lost out to VHS or the computer operating system (OS) Macintosh that only plays a very minor role beside Microsoft's Windows. To avoid this kind of battle a large number of actors in the mobile industry have partnered to create Symbian, an OS for cellular phones. Still, another two OS' compete in this market, namely Microsoft's Windows and the open source software Linux and it remains to be seen if the winter takes all. Yet an illustrative example that demonstrates that co-opetition can be advantageous is the European mobile telecommunication industry. In Europe, governments have agreed on adopting a common communication standard, the Global System for Mobile communication (GSM). This has given the then still young mobile phone industry a large boost and created a huge new market. In America on the contrary, there has been no standard in the mobile industry. They primarily relied on market forces. This has led to the proliferation of several incompatible standards and hindered the growth of the mobile telecommunication market in the United States. Another famous example of partnering for creating or at least boosting a market is the alliance between Microsoft and the chip manufacturer Intel. Intel's chief executive Andy Grove's strategy was (and still is) to continuously push his customers to the next level of technology through partnering with processor-intensive software makers. Intel has created alliances with Microsoft for its OS, with Hollywood's Creative Artists to produce virtual reality video games for the PC, it has invested in ProShare for desktop video conferencing and it has formed an alliance with the telecommunication provider MCI to get more fiber and capacity into company networks (Nalebuff and Brandenburger 1997).

Illustration Box 11: Co-opetition

B-Webs (Tapscott, Ticoll et al. 2000)

Tapscott et al. (2000) distinguish between five types of value networks, which differ in their degree of economic control and value integration. They call this types B-Webs. The first one, the so-called *Agora* facilitates exchange between buyers and sellers, who jointly discover a price through on -the-spot negotiations (e.g. eBay). In the second type, the *Aggregation* B-Web, one company leads in hierarchical fashion, positioning itself as a value-adding intermediary between producers and customers (e.g. Amazon.com). In the third B-Web, the *Value Chain*, a context provider structures and directs the network to produce highly integrated value propositions (e.g. Dell). The fourth network, the *Alliance*, strives for high value integration without hierarchical control (e.g. Linux). The last type, *Distributive Networks* keep the economy alive and mobile (e.g. FedEx).



Hierarchical.
Hierarchical networks have a dominant player, which leads value proposition, pricing and flow of transaction. For example, General Motors designs and leads the integrated supply networks to produce preconceived products.
Self-organizing.
In self-organized networks there is no dominant player. The market and its dynamics define the value and price of goods and services. In the open-source software movement, there is no management-imposed blueprint, because the product evolves through an organic development process.
High value integration.
A high degree of value integration means facilitating the production of a specific product or service by integrating value contributions from multiple sources. Dell achieves a high value integration by partnering with a number of suppliers and original equipment manufacturers (OEMs) to receive components and transform them into computers.
Low value integration.
A low degree of value integration means focusing on selection; that is, providing a basket of choices rather than a single integrated solution. Ingram Micro, which is a leading wholesaler of computer hardware and software, partners with over 1500 manufacturers and simply integrates their products into its offering.

Theory Box 6: B-Webs (Tapscott, Ticoll et al. 2000)

4.4.7 Agreement Element

Because partnerships are voluntarily initiated cooperative arrangement between two or more independent companies to carry out a an activity jointly they are based on a commonly negotiated terms and conditions. This is the reason I introduce the AGREEMENT sub-element. It aims at explaining the motivation, function and conditions of an arrangement between business partners.

Name of BM-Element	AGREEMENT
Definition	An AGREEMENT specifies the function and the terms and conditions of a partnership with an ACTOR
Element of	PARTNERSHIP
Related to	An AGREEMENT is always made *with* an ACTOR (1-n)
Cardinality	0-n
Attributes	***NAME*** {abc} ***DESCRIPTION*** {abc} ***REASONING*** {OPTIMIZATION AND ECONOMIES OF SCALE, REDUCTION OF RISK AND UNCERTAINTY, ACQUISITION OF RESOURCES} ***STRATEGIC IMPORTANC*** {0-5} ***DEGREE OF COMPETITION*** {0-5} ***DEGREE OF INTEGRATION*** {0-5} ***SUBSTITUTABILITY*** {0-5}

Table 35: Agreement

REASONING: Companies engage in partnerships for specific reasons. This attribute describes the firm's motivation to conclude a partner agreement. I distinguish between three rough categories of motivation; these are either optimization and economies of scale, reduction of risk and uncertainty or finally acquisition of resources (cf.. Illustration Box 12).

{Optimization and economies of scale}

The goal behind many partner agreements is the optimization of a company's operations. This can take the form of outsourcing (i.e. make or buy), but also shared infrastructure (Lu 2001). By entering these agreements a firm can profit of its partner's or supplier's economies of scale or of it's specialized knowledge, which it could not achieve on its own.

{Reduction of risk and uncertainty}

In a competitive environment that is characterized by uncertainty and high risk partnerships can increase anticipation and thus reduce the risk premium (Mariti and Smiley 1983). Companies can't afford launching costly experiments in the field anymore, because they have become too expensive and prefer engaging in temporary alliances with competitors (i.e. co-opetition)(Brandenburger and Nalebuff 1996).

{Acquisition of resources}

As described above firms must reflect on what kind of partner resources could leverage their business model and their own competencies. One frequent form of resource acquisition are partnerships to conquer foreign markets. But many other types of partnerships exist in this domain, such as knowledge acquisition, data, or customer access.

{Optimization and economies of scale}

In the apparel industry, the big player's like Benetton, The Gap or Hennes & Mauritz rely heavily on partners for their supply and production network (Camuffo, Romano et al. 2001). However, they apply different models. Benetton builds on a strong upstream vertical integration through its 32 production centers for strategic and capital intensive activities (weaving, cutting, dyeing) and out sources production of clothes (sewing) to a network of small and midsize enterprises that are directly controlled by the production centers. Benetton's competitors on the other hand rely on complete outsourcing. An example of shared infrastructure is the alliance between the Swedish car manufacturer Volvo and Renault of France in 1990. To stay competitive they initiated joint cooperation in R&D, design and procurement, as well as in manufacturing components for cars, trucks and buses (Mason 1993).

{Reduction of risk and uncertainty}

In the wireless industry a number of leaders started a cooperation in 1998 to create an open standard OS for data-enabled mobile phones in order to limit risk and uncertainty. Jointly, Ericsson, Nokia, Panasonic, Motorola, Psion, Samsung Electronics and Siemens set up a collectively owned software licensing company called Symbian. By doing this they avoided risking a balkanized mobile telephony market with incompatible operating systems, decreased R&D costs and reduced uncertainty. The players had a strong incentive to cooperate on the OS in order to profit from increasing returns of network externalities and compete on other grounds.

{Acquisition of resources}

In 1992, Playboy, a famous magazine form men decided to set up a joint-venture with VIPress, a Polish press group, to launch its Polish edition (Dussauge and Garrette 1999). RiverOne, an online market for electronics parts sells knowledge to support buying decisions. Using the firm's on-line research center, electrical engineers can view product specification, learn how to use components, and compare alternatives across an aggregate catalog of some 7 million parts (Dai and Kauffman 2002). Instill Corporation, an electronic market for the food services industry not only helps restaurant chain operators improve procurement, but also standardize and integrate purchase data, which enables buyers to understand how their expenses were allocated across different purchase areas (Dai and Kauffman 2002).

Illustration Box 12: Reasoning on partner agreements

STRATEGIC IMPORTANCE {0-5}: The strategic importance of a partnership how relevant a relationship is to the business success of a company. The more strategic a partnership the higher the score, which goes from 0 to 5.

DEGREE OF COMPETITION {0-5}: The degree of competition indicates if the partner with whom the firm has signed an AGREEMENT is a competitor or not. Partnerships between competitors in one domain while they compete in others are quite common today as outlined above.

DEGREE OF INTEGRATION {0-5}: The degree of integration measures how closely two ACTORS are linked together. This can differ from one type of partnership and agreement to another. The loosest link between two ACTORS is through independent third-party marketplaces (e.g. stock markets) and the closest link are tightly integrated supply chains (e.g. traditional EDI). Of course the frontier is unclear and there are plenty of cases situated between these two extremes. MarketSite, Commerce One's online marketplace has customized catalogs for Schlumberger, an American oil exploration company with the prices and product offering the company prenegotiated with vendors (Ovans 2000). Private cataloging is favored in transactional purchasing, where the reason for joining on-line markets is to reduce operating costs (Dai and Kauffman 2002).

Integrating partnerships

An example of a type of closely integrated relationship between two companies can be found in the retailing business. Because ICT has lowered coordination and transaction costs and facilitated the flows of information, many retailers have introduced a concept called Vendor Managed Inventory (VMI). This is a process where the supplier generates orders for his customer based on demand information sent electronically by the customer. This means that the buyer completely transfers supply management to his supplier, who controls the stock of the buyer and refurnishes automatically, when necessary. Benefits comprise lower inventory for supplier and customer, lower administrative costs and increased sales (Hall 2000).

VMI makes sense for economical reasons, but it also means that a firm shifts responsibility, authority and hence knowledge about replenishment to its supplier and therefore enters a dependent relationship (Tanskanen, Holström et al. 2002). When the American no-frills Airline, Southwest, signed a ten-year engine maintenance contract with General Electric, paying GE on a rate per flight hour basis for practically all engine maintenance it entered an even bigger dependency. But through this agreement Southwest was able to reinforce its low-cost airline strategy by reducing its capital investments and cutting maintenance costs substantially (Corbett 2001).

Illustration Box 13: Partner integration

SUBSTITUTABILITY {0-5}: The substitutability of a partnership indicates how easy it would be to find a substitute partner offering the same arrangement. The easier it is to find a substitute the higher the score, which goes from 0 to 5.

4.5 FINANCIAL ASPECTS

FINANCIAL ASPECTS is the last block of our framework: It is transversal because all other pillars influence it. This block is the outcome of the rest of the business model's configuration. FINANCIAL ASPECTS is composed of the company's REVENUE MODEL and its COST STRUCTURE. Together they determine the firm's profit- or loss-making logic and therefore its ability to survive in competition.

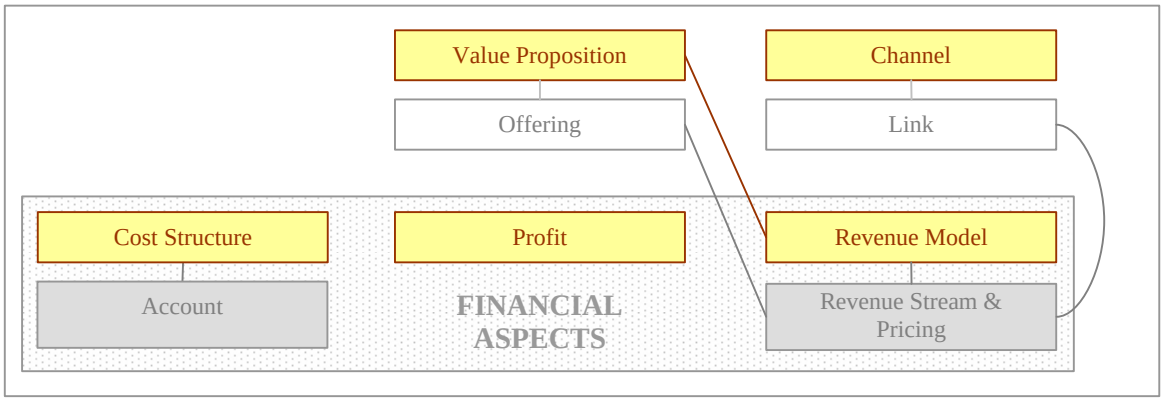


Figure 49: Financial Aspects

4.5.1 Revenue Model Element

The REVENUE MODEL is the eighth element of the business model ontology and it measures the ability of a firm to translate the value it offers its customers into money and incoming revenue streams. A firm's REVENUE MODEL can be composed of different revenue streams that can all have different pricing mechanisms.

Name of BM-Element	REVENUE MODEL
Definition	The REVENUE MODEL describes the way company makes money. It can be composed of one or several REVENUE STREAM AND PRICING elements.
Part of	FINANCIAL ASPECTS
Related to	A REVENUE MODEL is *built on* and depends of the firm's VALUE PROPOSITIONs (1-n).
Set of	REVENUE STREAM AND PRICING(s) (0-n)
Cardinality	1-n
Attributes	Inherited from REVENUE STREAM & PRICING (section 4.5.2)

Table 36: Revenue Model

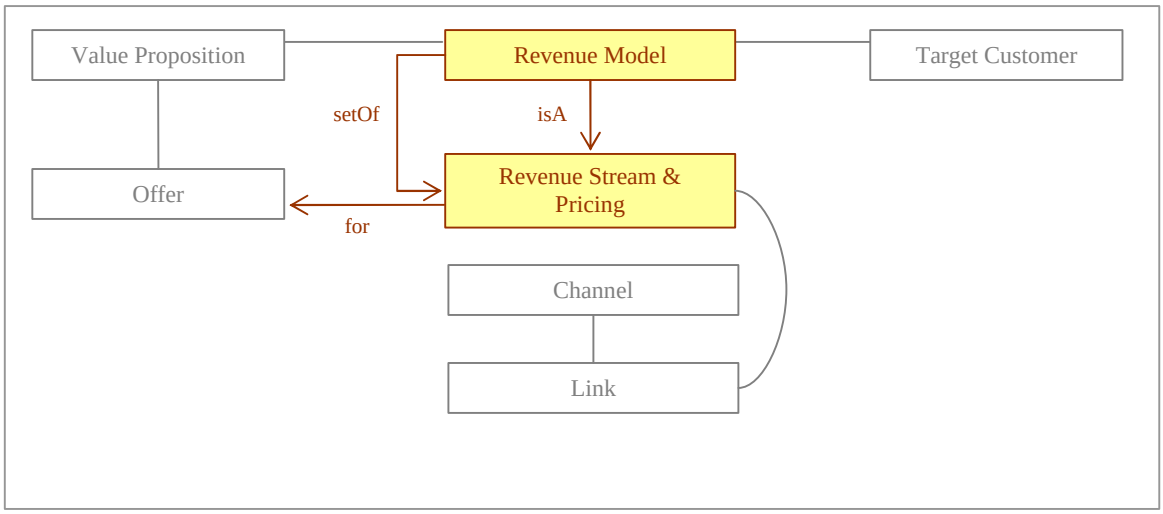


Figure 50: Revenue Model

4.5.2 Revenue Stream and Pricing Element

The revenue streams a company can capture from its value creating activities are pivotal to its long-term survival. A firm can have one to many different revenue streams and each of them can have one or several different pricing mechanisms. In general it can be said that ICT has helped companies diversify their revenue streams and has facilitated the adoption of more accurate pricing mechanisms. The great variety of pricing mechanisms enabled by ICT helps companies improve revenue maximization. Particularly the Internet has had an important impact on pricing and has created a whole new range of pricing mechanisms (Klein and Loebbecke 2000). In general the Internet has had a heavy impact on pricing, as it has become much easier to compare prices. As a consequence this will probably conduct firms to abandon fixed or at least comparable pricing. Furthermore, these changes may bring customers the freedom to advance from the simple servitude of the price-taker to a more powerful position of the price-maker (Pitt, Berthon et al. 1999).

Price comparison shopping

With the growing popularity of the Internet price-comparison shopping has enjoyed a huge success. In numerous countries and domains Websites and price-comparison engines have popped up that allow customers to compare product offerings of online and offline sellers and reveal almost complete information on the alternatives (Kocas 2002). In economic terms this means that the search costs for customers to find an alternative are low enough to make the effort. For sellers this consequently has implications on customer loyalty. The German start-up Guenstiger.de for example, even makes in-store price comparison possible. It allows customers to send a product name to a computer by Short Message System (SMS) through a mobile phone. Seconds later the reply-SMS with the cheapest store and product in town follows from a database. An even more luxurious version is offered to those that don't like writing SMS': they can simply connect a small barcode scanner to their phone. All this gives the customer the choice to either go to the store with the lower price or start negotiating with the vendor, referring to the price indicated in the SMS.

Illustration Box 14: Price Comparison Shopping

Another important evolution having implications on pricing is the economic logic underlying value creation in the knowledge economy. According to Varian (1996) "the classic prescription for economically efficient pricing---set price at marginal cost---is not relevant for technologies that exhibit the kinds of increasing returns to scale, large fixed costs, or economies of scope found in the telecommunications and information industries". This means that firms will have to increasingly focus on the customer's marginal willingness to pay and apply differential prices (i.e. different prices for different customers).

Name of BM-Element	REVENUE STREAM AND PRICING
Definition	The REVENUE STREAM AND PRICING element describes an incoming money stream from the value offered by the company. Furthermore it defines what mechanism is used to determine the price of this value offered. The element is characterized by its attributes STREAM TYPE and PRICING METHOD.
Element of	REVENUE MODEL
Related to	A REVENUE STREAM AND PRICING is for one or several OFFERINGs (1-n) Every channel LINK can has one or several REVENUE STREAM AND PRICING elements (1-n)
Cardinality	0-n
Attributes	***NAME*** {abc} ***DESCRIPTION*** {abc} ***STREAM TYPE*** {SELLING, LENDING, LICENCING, TRANSACTION CUT, ADVERTISING} ***PERCENTAGE*** {123} ***PRICING METHOD*** {FIXED, DIFFERENTIAL, MARKET}
References	(Klein and Loebbecke 2000) (Pitt, Berthon et al. 1999)

Table 37: Revenue Stream and Pricing

STREAM TYPE: The stream type describes the type of economic activity with which a company generates a revenue stream. A company can generate income through *selling*, *lending* or *licensing* a product or service, taking a *cut of a transaction* or relying on different sources of *advertising*.

{Selling}

For the purpose of describing revenue stream types I define selling as the activity of giving away certain aspects of ownership of a good or service in exchange for money. A record company that sells CDs loses the ownership rights on the CDs it sells but keeps the intellectual rights of its content. Once the CD is sold it can not generate additional revenue.

{Lending}

Lending is the activity of giving something to someone for a period of time, expecting it to be given back. A company can generate an income from this activity. An important characteristic of lending, making it different from licensing, is that the object given away can not be used during the time it is away. The implication for revenues is that the object lent generates an income at the moment it is given away but cannot generate income while it is away. If a bank or other organization lends money, it gives money to someone who agrees that he will pay the money back in the future, usually with additional money added to the original amount. While the money is lent, the bank cannot generate any additional revenue on the sum given away temporarily.

{Licensing}

Licensing is the activity of giving someone official permission to do or have something. A patent- or copyright-holder can accord another company a permission to use, produce or sell a patented invention or protected intellectual property in exchange for a licensing fee. Contrary to lending licensing can theoretically generate unlimited income, except in the case of exclusive licenses. Licensing is a commonplace way for patent- and copyright-holders to generate revenues from their property while not necessarily having to produce and commercialize a good or service.

Franchising is a specific form of licensing when a business, the franchisor, licenses its trade name, brand and business methods to an organization, the franchisee. The franchisee agrees to operate the business in accordance with the Franchise Agreement with the franchisor's support. In return the franchisee pays a fee as well as on-going royalties. This enables a company to expand and distribute goods or services while giving individuals the opportunity to operate their own business under a recognized brand or trademark.

{Transaction Cut}

A business transaction is doing and completing a business activity between two or several organizations where goods or services are exchanged for money. A transaction cut or commission is the fee that is paid to the party that has organized, facilitated, or performed the deal. Transaction cuts are the main revenue streams of many electronic business platforms who provide the matchmaking facilities for buyers and suppliers. Investment banks are another category of organizations that rely heavily on transaction cuts of the deals they make.

{Advertising}

Advertising is the activity of telling about or praising something publicly, as through a media (e.g. press, TV, web, billboard, etc.) so as to influence the choice, opinion or behavior of those addressed. It can be defined as any paid message communicated by an advertising media. Every product or event enjoying a large attention is interesting to an advertiser. Therefore the media sector and event organizers rely heavily on advertising as a revenue stream.

However, as ICTs have made it a lot easier to target specific groups of people, advertisers are increasingly interested in "advertising carriers" that are able to address an identified segment.

PERCENTAGE: This attribute simply measures how much a specific revenue stream contributes to the total REVENUE MODEL.

PRICING METHOD: I differentiate between three main categories of pricing mechanisms, which are *fixed pricing, differential pricing* and *market pricing*, which all have a number of different pricing mechanisms (see Table 38).

{fixed pricing}

Fixed pricing mechanisms produce prices that do not differentiate in function of customer characteristics, are not volume dependant and are not based on real-time market conditions. The major mechanisms of this category are pay-per-use, subscription and menu pricing.

In pay-per-use the customer pays in function of the time or quantity he consumes of a specific product or service. For example, the customer of an online music provider may be charged for every time he

listens to a piece of music, a car rental agency may charge him for every kilometer driven or an online newspaper may charge for every article read.

In the case of a subscription mechanism the customer pays a flat fee in order to access the use of a product or to profit from a service. Actually, in the online music industry pay-per-use and subscription pricing often coexist and it is let to the user to chose between the mechanisms according to his preferences.

Menu pricing stands for a fixed price that is often found in a list or catalog and is used in relationship with the terms list price or catalog price.

{differential pricing}

Differential pricing refers to pricing mechanisms that produce prices that are either based on customer or product characteristics, are volume dependant, or are linked to customer preferences, but not based on real-time market conditions. The major mechanisms of this category are product-feature-dependant, customer-characteristic-dependant, volume-dependant and value-based pricing.

Pricing mechanisms based on product-features are increasingly popular since products and services become more and more configurable. Sellers prefer these variable prices because it makes it harder for customers to compare prices. Bundling of different products and services also fall in this category.

Customer-characteristic-dependant pricing mechanisms have existed for a long time but they have known a real boom with the rise of cheap ICTs. Because nowadays it is affordable to build and maintain large customer databases with detailed customer profiles, prices can theoretically be tailored to the characteristics of every single customer.

Volume-dependant pricing is less sophisticated than the former mechanism and simply differentiates prices on the basis of purchased volumes.

Value-based pricing puts the customer back into the driving seat and gives him an important role in the price-making process. This means that the final price will strongly depend on the customer's valuation of a value proposition.

Priceline

Priceline provides an online market platform where customers can specify their preferences, including price, on a range of products from airfares over hotels to complete vacations (Klein and Loebbecke 2000). On this platform it is the customer that makes a price offer for a service, such as for example an airfare, which is binding and backed-up by his credit card. These offers are open enough that they can be forwarded to different service providers that will then decide to accept or refuse the offer based on their current load factor and price policy.

Illustration Box 15: Value-based pricing at Priceline

{market pricing} (dynamic)

Market pricing stands for pricing mechanisms that produce prices based on real-time market conditions. The major mechanisms of this category are bargaining, yield management, auctions, reverse auctions and dynamic market (e.g. stock markets).

Bargaining between buyers and sellers is the most traditional dynamic pricing mechanism and has existed for thousands of years. But in large and depersonalized markets bargaining has become less and less efficient, started to disappear and only persists for large product- or service-contracts. However, in some cases ICT has made bargaining efficient again. The price outcome of bargaining heavily depends on the existing power relationships between the parties involved.

Yield management is the practice of maximizing profits from the sale of perishable assets, like airline tickets or a night in a hotel room, by controlling price and inventory. It is a way to provide flexibility as market conditions change without undermining value in the customer's mind . Yield management is an economic technique to calculate the best pricing policy for optimizing profits based on real-time modeling and forecasting of demand behavior (Weigand 1999). This pricing mechanism

revolutionized the airline industry in the early 1980s and has found its way into many other domains. Especially the Internet has helped companies achieving a positive impact on profitability thanks to yield management (Marmorstein, Rossomme et al. 2003).

Auctions have existed for many years, but their major expansion to a large number of other domains has particularly happened with the rise of the Internet. In a classical auction the seller lists the goods he wants to sell and buyers bid in increasing increments of price. The high bidder wins the right to purchase the item. There exists a large variety of different auction types and mechanisms.

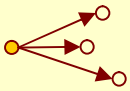
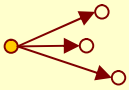
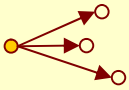
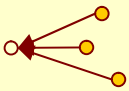
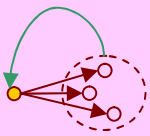
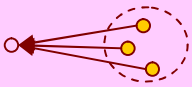
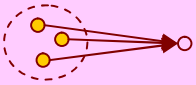
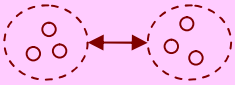
	Pricing mechanism	seller / Interaction pattern / buyer	Price taker ●	Price maker ●
Fixed Pricing	Pay-per use		buyer	seller
	Subscription		buyer	seller
	List price/menu price		buyer	seller
Differential Pricing	Product feature dependant		buyer	seller
	Customer characteristic dependant		buyer	seller
	Volume dependant		buyer	seller
	Value-based		seller	buyer
Market Pricing	Bargaining		Balance of power	
	Yield management		seller (based on market)	
	Auction		demand-side market (increasing prices)	
	Reverse auction		supply-side market (decreasing prices)	
	Dynamic market		market	

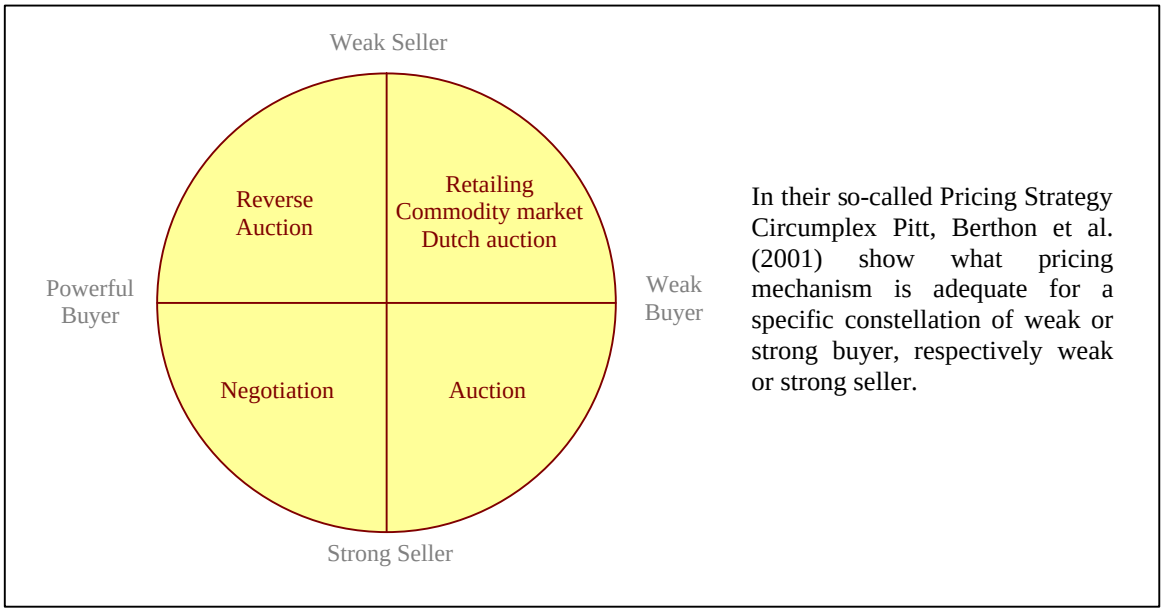
Table 38: Pricing mechanisms

The reverse auction is a specialized auction format that allows individuals/organizations to procure goods and services at the lowest possible price. Contrary to classical auctions prices decline in reverse

auctions, the. A buyer will post a price at which the bidding will start and the lowest bidder will win the right to sell the item.

Under dynamic market I understand a price mechanism that produces prices that are the reflection of real-time and close-to-optimal market conditions. This means that a price is the outcome of a large number of buyers and sellers that have indicated their price preference, but are not able to influence this price as individual sellers.

In Theory Box 7 Pitt, Berthon et al. (2001) illustrate how different pricing mechanisms should be applied in different circumstances.



Theory Box 7: Pricing Strategy Circumplex (Pitt, Berthon et al. 2001)

4.5.3 Cost Structure Element

This element measures all the costs the firm incurs in order to create, market and deliver value to its customers. It sets a price tag on all the resources, assets, activities and partner network relationships and exchanges that cost the company money. As the firm focuses on its core competencies and activities and relies on partner networks for other non-core competencies and activities there is an important potential for cost savings in the value creation process.

Name of BM-Element	COST STRUCTURE
Definition	The COST element measures all monetary costs incurred by the company.
Part of	FINANCIAL ASPECTS
Inherits from	ACCOUNT
Set of	ACCOUNT(s) (0-n)
Cardinality	1-n
Attributes	Inherited from ACCOUNT (section 4.5.4)
References	(Maître and Aladjidi 1999)

Table 39: Cost Structure

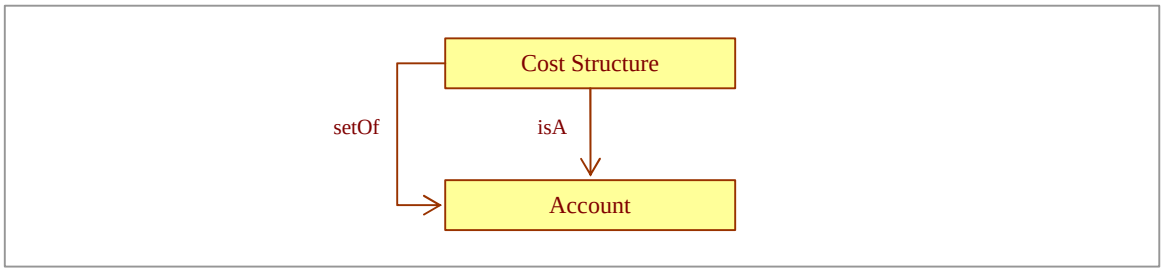


Figure 51: Cost Structure

4.5.4 Account Element

An account simply defines a specific type of expenditures. This can be a detailed account according to accountancy theory or an aggregate of expenditures. Maître and Aladjidi (1999) use revenues, cost of goods sold, gross margin and operating expenses to present the financial situation of different business models. Further, they split operating expenses in R&D, S&M and general and administrative expenses for a more detailed but still aggregate representation.

Name of BM-Element	**ACCOUNT**
Definition	An ACCOUNT is a registry of pecuniary transactions (expenditure) of a certain category
Element of	COST
Cardinality	1-n
Attributes	***NAME*** {abc} ***DESCRIPTION*** {abc} ***SUM*** {123} ***PERCENTAGE*** {123}

Table 40: Account

SUM: The sum measure the monetary value of an ACCOUNT.

PERCENTAGE: This attribute simply measures how much a specific ACCOUNT contributes to the total COST STRUCTURE.

5 CASE STUDY: MJF

The case study of the Montreux Jazz Festival MJF serves as an illustration of the business model ontology. Furthermore it examines the ontology's applicability to a real-world case and shall help eliminate incoherencies. The case study was accomplished through information research on the Internet, a series of open interviews with executives and employees of the MJF and a study on the MJF and its impact on the region (UERT 2002). In addition I have drawn from my personal experience when I worked in the MJF administration of the 2003 Festival edition.

The presentation of the MJF in the next sections is structured according to the business model ontology. It is just one of the several possible presentations.. A characteristic of the business model ontology is that it allows presenting a business model on two, ten or 40 pages according to specific needs and usages. This particular presentation aims at giving a condensed and understandable overview of the MJF's business model on the first two levels of abstraction of the business model ontology. The fully seized business model of the MJF containing all the details of the business model ontology can be found at www.hec.unil.ch/aosterwa/PhD. Below I present a dozen-page-long overview of the MJF's business model as well as a bird's eye view (see Figure 52)

5.1.1 The Montreux Jazz Festival

In 2003 the Montreux Jazz Festival, which was founded in 1967, celebrated its 36th anniversary in the little Swiss city of Montreux at the shores of the Lake of Geneva. Led by the inspirational figure, Claude Nobs, the Festival has become a genuine international venture with a presence on four continents and has grown to a budget of 15 million Swiss francs. Beside the main annual festival in Montreux, Switzerland, licensing agreements have led to the creation of "The Montreux-Detroit Jazz Festival", "The Montreux-Atlanta Jazz Festival", "Montreux Festival On Tour" and "The Montreux Jazz Festival in Monaco". Until 1995 the Festival was linked with the Montreux Tourist Office. At that time the Montreux Jazz Festival Foundation was created and since then the Festival has been its main activity and responsibility under the direction of Claude Nobs and the supervision of an eight-man strong foundation board. At the same time Montreux Sounds was born, a fully independent incorporation owned by Claude Nobs and Thierry Amsallem, to manage the rights of the huge archive of MJF recordings and clips accumulated since 1967.

At its beginnings the Festival concentrated mainly on jazz, but over the years it has also widened its musical horizons and offers a range of styles that cater for all the public. Besides its main concerts the Montreux Jazz Festival has become a broad happening with its so-called "off Festival" events, featuring free concerts and a variety of food and commercial stands. The Festival numbers of 2003 include an estimation of 240'000 visitors, the sales of 94'300 tickets, the participation of 44 DJs, 326 groups. 1'200 diverse staff members ensured the proper course of the event and served 140'000 liters of beer. Furthermore, the Festival's popularity is also true in terms of media, illustrated by the presence of 502 national and international journalists.

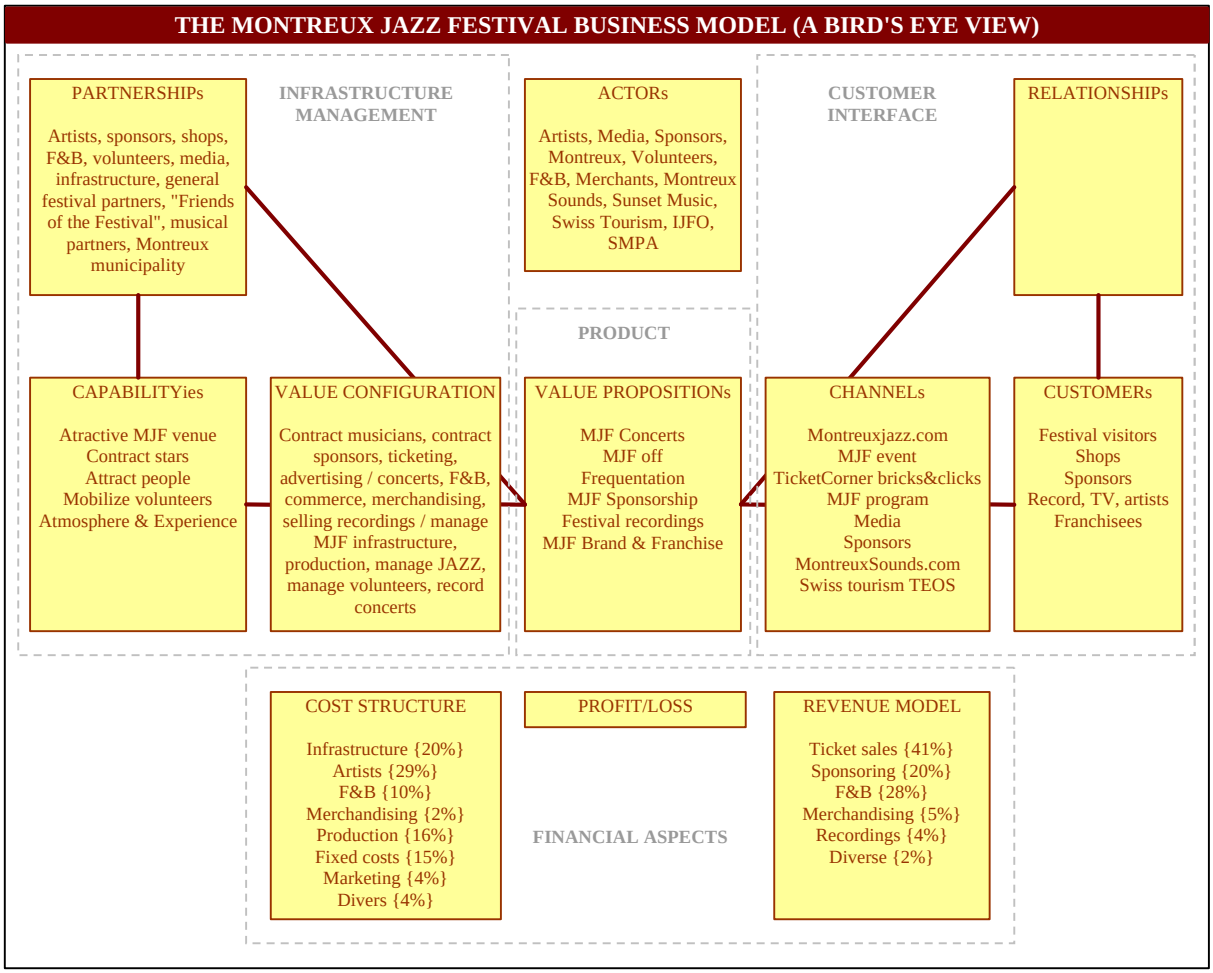


Figure 52: A bird's eye view of the Montreux Jazz Festival's business model

5.1.2 Product

In this section I show what VALUE PROPOSITIONs the MJF offers to the market.

VALUE PROPOSITION

The Montreux Jazz Festival (MJF) has five main VALUE PROPOSITIONS that rely on five core CAPABILITIES (cf. section 5.1.4) and address four different groups of TARGET CUSTOMERS (cf. section 5.1.3). These relationships are illustrated in Figure 53.

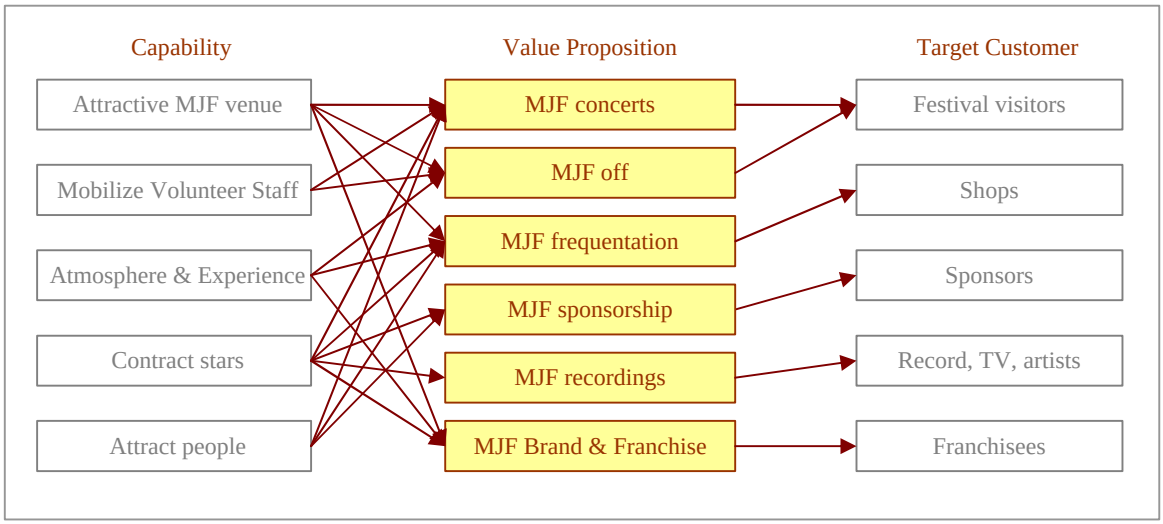


Figure 53: The Montreux Jazz Festival's Value Propositions

VALUE PROPOSITION 1: MJF concerts. The main attraction and VALUE PROPOSITION of the MJF are its prestigious concerts with stars from jazz, pop, rock, hip-hop and more. The MJF has made itself a name with the regular by featuring unforgettable jazz musicians like Miles Davis, Keith Jarett, Charlie Mingus, Ella Fitzgerald and later stars from other fields like Bob Dylan, Phil Collins or Guru's Jazzmatazz. The 2003 event was starring artists across the musical range, such as George Benson, Joao Gilberto, Simply Red or Cypress Hill. This VALUE PROPOSITION can be decomposed into a set of three OFFERINGs:

> *MJF evening concerts*. The evening concerts comprise the major event of payable concerts on three different stages, the Stravinski Auditorium, the Miles Davis Hall and the Casino.
>
> *MJF boats*. As Montreux is situated at the shores of the charming Lake of Geneva the MJF organizes cruises departing in the afternoon and returning in the evening. The MJF boats have already become famous for their parties on the lake.
>
> *MJF trains*. The MJF offers musical train journeys along the idyllic Riviera and Alpine scenery. The beautiful sights are underlined with great sounds. Three trains make their way through the mountains to the village of Rochers-de-Naye and three others travel to the famous village of Gstaad. All trains depart and return from/to Montreux.

VALUE PROPOSITION 2: MJF off. The MJF attracts thousands of people, an estimated 240'000, for its renown festival atmosphere at the so-called "off Festival". This includes free concerts, food from around the world and shopping stands along the shores of the Lake of Geneva. This VALUE PROPOSITION is composed of a set of five OFFERINGs:

> *MJF off stages*. There are nearly 300 free concerts on offer across three main stages. In addition, there are a variety of improvised acts throughout the town of Montreux.
>
> *Montreux Jazz Café*. It is the place to be for all the festival goers. The Jazz Café is a free night club which features sets from international and national DJ's mixing all styles of electronic music. It opens every evening of the Festival and lets people party until dawn.
>
> *MJF off atmosphere*. The MJF attracts people from all over for its great atmosphere at the shores of the Lake of Geneva. A large variety of diverse food and handicraft stands compete for the attention of the festival goers.
>
> *MJF workshops*. The workshops have been organised since the Festival began, in order to offer the public privileged moments with some of the artists that perform at the Stravinski Auditorium or Miles Davis Hall or allow encountering teachers of the Montreux-Vevey Conservatory. These are free educational events particularly for amateur musicians and those passionate about music.

MJF competitions. The MJF seeks to find the stars of tomorrow and features the solo piano, sax, and voice competitions, as well as the Chrysler Jazz awards. The most promising young artists come from across the globe to perform in front of an international jury of renowned musicians. As for all the events of the MJF off entry is free.

VALUE PROPOSITION 3: MJF frequentation. As the Festival has grown it attracts an ever growing crowd. To date an estimated 240'000 people stroll through the Festival "on" and "off". This is an attractive VALUE PROPOSITION for advertisers and the stands that populate the streets during the Festival.

VALUE PROPOSITION 4: MJF sponsorship. The international reputation and the size of the MJF makes it an ideal partner for sponsorships. With its great concerts, large crowd and international media presence it gives affiliated sponsors a large visibility (see Illustration Box 16 for a detailed view). A Sponsorship comprises four main OFFERINGs:

Affiliation. The sponsor is affiliated to the Festival's visual identity, is visible on all the prints and the Internet site. Moreover, the Festival has a very high visibility in the national and international media, illustrated by 502 officially registered journalists from the four corners of the world.

Advertising space. The MJF is visited by an estimated 240'000 people with 94'300tickets sold for the concerts. The sponsor has a privileged visibility on the site through banners, promotional booths and branded stages.

Sponsors' events. Sponsors benefit from several special events organized for them at the MJF. Furthermore, they can enjoy private VIP and catering facilities.

Free tickets. Sponsors receive free tickets and can profit to invite special employees or their best clients to the Festival.

VALUE PROPOSITION Name: MJF sponsorship

Description: The international reputation and the size of the MJF makes it an ideal partner for sponsorships. With its great concerts, large crowd and international media presence it gives affiliated sponsors a large visibility.

Reasoning: {Use}: An MJF sponsorship contract gives a partner the possibility to potentially address 240'000 people and build be co-branded with the MJF.

{Risk}: As the MJF is an established institution with an established brand and a solid customer base the risk of entering a troubled partnership is very low.

Value level: {Me-too}: The MJF is a mass advertising "media" among others. Thought it is one of the top established festivals the value level of a sponsorship with the MJF is comparable to other festivals.

Price level: {Market}: The price level of a sponsorship at the MJF is situated at market levels.

Composed of OFFERINGs: (detailed OFFERINGs in the annex on www.hec.unil.ch/aosterwa/PhD)

- Affiliation
- Advertising space
- Sponsors' events
- Free tickets

Value for TARGET CUSTOMER: TARGET CUSTOMER 3: Sponsors

Based on CAPABILITYies: CAPABILITY 2: Attract and feature great stars and concerts

CAPABILITY 4: Attract people

Illustration Box 16: Detailed VALUE PROPOSITION seizing

VALUE PROPOSITION 5: MJF recordings. The MJF staff includes a highly professional production team that produce great recordings of the event. These recordings can be licensed by TV or radio station and music producers. Since 1988, Montreux Sounds SA, owners of the Montreux Jazz Festival archives, have accumulated a large collection of video footage.

VALUE PROPOSITION 6: MJF brand & franchising. After licensing the successful model of the MJF to other parts of the world the Festival is moving toward franchising to assure the quality of the label MJF. Besides licensing and franchising the Festival it also exports the Montreux Jazz Café and Jazz Club concept to cities and events all over the globe.

5.1.3 Customer Interface

In this section I describe all customer-related issues of the MJF's business model. I outline which TARGET CUSTOMERs it addresses through which CHANNELs it does this and I describe what CUSTOMER RELATIONSHIPs it maintains.

TARGET CUSTOMERs

The MJF's five VALUE PROPOSITIONS target four different groups of TARGET CUSTOMERS (cf. Figure 53).

TARGET CUSTOMER 1: Festival visitors. The Festival lives from its visitors. Every year the MJF attracts an ever growing crowd, registering a 10 percent increase in 2003 and reaching an estimated 240'000 visitors and 94'300 tickets sold. The MJF targets a very large range of people that are interested in music and amazed by the Festival atmosphere. A particularity of the MJF is that its programming covers all age groups equally (see Table 41). The visitor group of TARGET CUSTOMERS can be split into a set of two CRITERION.

> *Concert visitors.* People that are ready to pay between CHF 40.- and CHF 120.- for a MJF concert.
>
> *Festival goers.* People that are attracted to festivals and events with large crowds.

<18	**18-25**	**26-35**	**36-49**	**>49**
5.6%	27.5%	30.9%	24.2%	11.8

Table 41: MJF customers

TARGET CUSTOMER 2: Shops. The MJF aims at attracting premium stands with a variety of international food, handicraft and gadgets. They consist of a set of two CRITERIONS:

> *Caterers.* The MJF targets caterers with a certain festival experience, many of which are part of the MJF for several years already.
>
> *Handicraft and Gadgets.* The MJF targets shops that sell attractive things in line with the MJF's values.

TARGET CUSTOMER 3: Sponsors. The MJF aims at attracting large sponsors with a good image and the will to invest in and co-brand the MJF.

TARGET CUSTOMER 4: Licensees. This group of target customers consists of TV and radio stations and audiovisual professionals that look for source material for their own compilations.

DISTRIBUTION CHANNELS

The MJF offers and markets its VALUE PROPOSITIONs through seven different DISTRIBUTION CHANNELs. They are described in the following lines and illustrated in Figure 55.

DISTRIBUTION CHANNEL 1: www.montreuxjazz.com. The MJF website plays an important role in the promotion, information diffusion and ticket purchasing of the event. It is composed of a set of the following LINKS:

> *Online program.* The MJF website contains a complete and detailed program of all concerts and events during the Festival. {awareness}
>
> *Artist description.* In addition to the program the website includes a detailed description of the artists and their musical style. {evaluation}
>
> *News feed.* The MJF website is the most up-to-date news resource informing about changes

and events. {after sales}

Online web casts of concerts. The Festival streams a large number of the concerts over the Internet, making them available to the public. {awareness, after sales}

Online ticketing. Tickets for the MJF concerts, boats and trains can be bought directly online. Note that this is also an OFFERING (see Figure 54). {purchase}

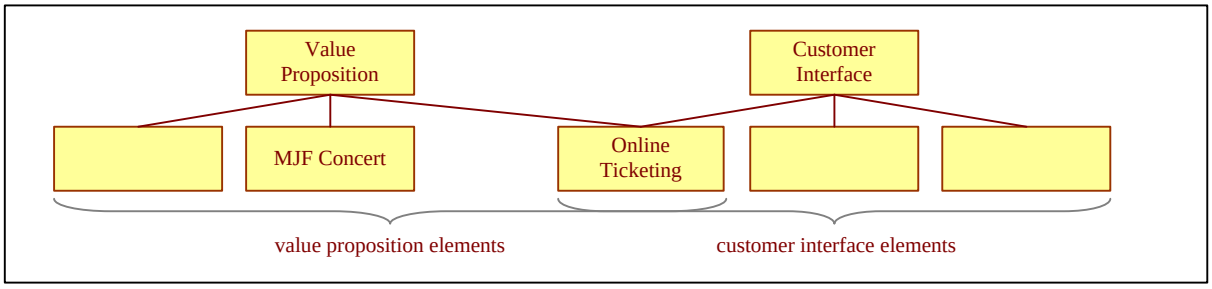


Figure 54: A LINK can be an OFFERING and thus part of a VALUE PROPOSITION

Online shop. The website also features an online shop selling merchandising articles. {purchase}

Virtual tour. The "Montreux Jazz Virtual Tour" lets website visitors virtually capture some of the Festival atmosphere through 360 degree panoramic pictures. {evaluation, after sales}

Various information. The website also serves as a practical guide to the Festival providing information ranging from maps over accommodation offers to public transport schedules. {after sales}

DISTRIBUTION CHANNEL 2: MJF event. The MJF is part of the VALUE PROPOSITION but functions as a CHANNEL at the same time and brings together musicians, music lovers, sponsors and advertisers. As a CHANNEL it constitutes a set of the following LINKS:

Advertising. Concerts and events are advertised on the Festival site, including banners, posters and information stands. {awareness}

Ticket office. Tickets can be bought, ordered and reserved at the ticket office. {purchase}

DISTRIBUTION CHANNEL 3: Ticket Corner. Ticket Corner is a fully owned subsidiary of NAGRA of the Kudelski Group and sells tickets of various Swiss events from concerts to sports events. Ticket Corner maintains a network of ticket agencies throughout Swiss cities. It is a set of the following LINKS:

Advertising. In its agencies Ticket Corner features posters and flyers of different events including the MJF. {awareness}

Ticket agencies. Ticket Corner sells MJF tickets throughout its agencies in Switzerland. {purchase}

DISTRIBUTION CHANNEL 4: www.ticketcorner.ch. www.ticketcorner.ch belongs to Ticket Corner and is a partner CHANNEL that sells tickets of various Swiss events from concerts to sports events. Illustration Box 17 gives a full view of this CHANNEL. It sells part of its tickets directly over the Internet and is composed of a set of the following LINKS:

MJF concert listing. Ticket Corner's online database can be searched for Swiss events including all the concerts of the MJF. {awareness}

Online ticketing. MJF tickets can be directly ordered over the Ticket Corner website. They are then sent to the customer. {purchase}

CHANNEL Name: www.ticketcorner.ch

Description: www.ticketcorner.ch belongs to Ticket Corner and is a partner CHANNEL that sells tickets of various Swiss events from concerts to sports events. They also sell MJF concert tickets.

Reasoning: {Use}: The concerts of the MJF can conveniently be found on the website in the Ticket Corner database.

{Effort}: The customer can comfortably order the tickets over the Internet and get them delivered directly to his home.

Value level: {Me-too}: Online ordering of tickets for a specific event have become quite commonplace.

Price level: {Free}: Customers have to pay a fee for handling an delivery of an order.

Composed of LINKs:

- MJF concert listing.
- Online ticketing.

Delivers VALUE PROPOSITION: VALUE PROPOSITION 1: MJF concert (tickets).

Delivers to TARGET CUSTOMER: TARGET CUSTOMER 1: Festival visitors.

Illustration Box 17: Detailed View of the www.ticketcorner.ch Partner CHANNEL

DISTRIBUTION CHANNEL 5: MJF program. The MJF program magazine gives a detailed view of the Festival with descriptions of all its events and concerts. It is a set of the following LINKS:

Free distribution. The MJF program is printed in high quantities and distributed freely before and during the event in order to reach a maximum public. {awareness}

Artist and event description. The MJF program describes all concerts and events during the Festival. Furthermore it gives an overview of the artists and their musical style. {evaluation}

DISTRIBUTION CHANNEL 6: Media. As the name suggests the media are directly linked to a medium of communication and are therefore vehicles for the promotion of the Festival. There are four types of Festival media partners: Internet, print media, radio and television. Each has an agreement that reflects the specific nature of their network, the frequency of broadcasts and the inherent possibilities of their medium. According to the different characteristics of the different media, the media partners inform in more or less detail about the MJF. {awareness}

DISTRIBUTION CHANNEL 7: www.montreuxsounds.com. Since 1988, Montreux Sounds SA, owners of the Montreux Jazz Festival archives, have accumulated a large collection of video footage for worldwide TV and media broadcast. On their website they maintain a searchable database of sounds and clips recorded at Montreux since 1967. The database can be queried on-line with a search engine. {evaluation}

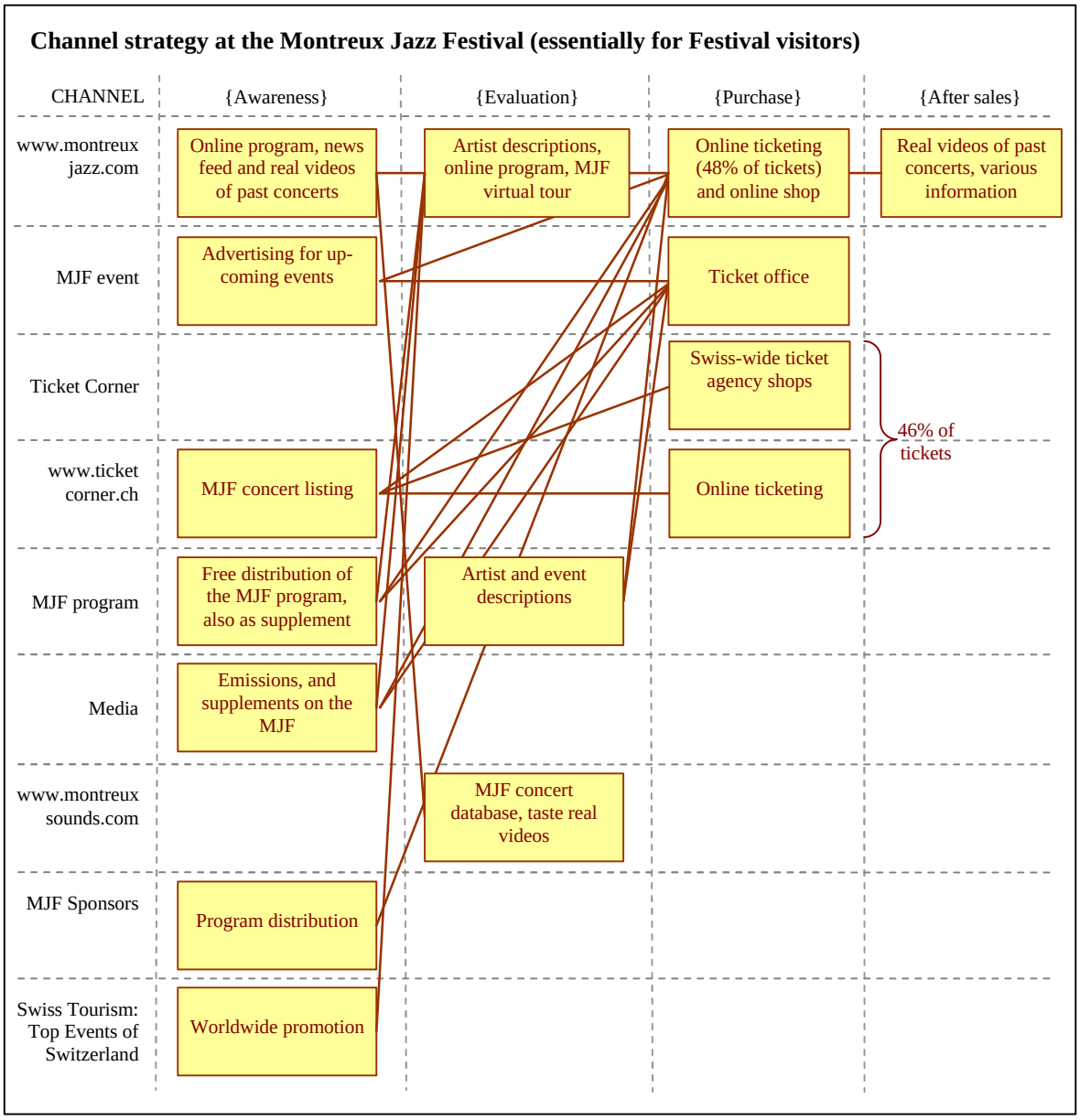


Figure 55: MJF Channel Strategy

DISTRIBUTION CHANNEL 8: Sponsors. The sponsors are an important distribution and communication channel of the MJF. They distribute programs through their own network, advertise in association with the MJF logo and give the MJF a visual presence in their points-of-sales.

DISTRIBUTION CHANNEL 9: Swiss tourism "Top Events of Switzerland". TEOS is an alliance between Swiss tourism and seven leading Swiss world-class events in art, cinema, all styles of music, golf, tennis and polo, in settings of unsurpassed beauty.

RELATIONSHIP MANAGEMENT

The MJF essentially maintains three relational strategies.

Relationship 1 with Sponsors & VIPs. The MJF carefully pays attention to its relationships with sponsors and VIPs that it embraces the same way. During the Festival it makes wants them to live a unique experience. Therefore, they installed a special host and protocol service. Guests of the MJF (i.e. sponsors and VIPs) and guests of the sponsors are escorted through the venue, have access to the VIP zones and bars and even visit the backstage. The service handles up to 800 guests an evening. {customer equity: retention}

Relationship 2 with the Festival's visitors. The MJF maintains an address book of over 60'000

occurrences worldwide which it uses to annually distribute the MJF program. Furthermore, visitors of the MJF website can subscribe to a newsletter that allows them to keep up-to-date and get the Festival program the instance it becomes official. {customer equity: acquisition/retention}

Relationship 3 with all customer segments. Whereas the beginnings of the MJF in the 70s and 80s were characterized by focusing on acquisition and attracting new festival visitors it has today reached its capacity limits and directs all its efforts to brand building during and after the event. It aims at reinforcing its image of a superior festival and exports this image through franchising. {customer equity: retention}{function: brand}

5.1.4 Infrastructure

In this section I explain what the MJF has to dispose of to offer its VALUE PROPOSITION and maintain its CUSTOMER INTERFACE. I outline the CAPABILITYies necessary, draw a picture of the VALUE CONFIGURATION and show what kind of PARTNERSHIPs the MJF has entered to underpin its business model.

CAPABILITYies

In order to make its VALUE PROPOSITIONs possible the MJF has to master essentially five CAPABILITYies (see Figure 53).

CAPABILITY 1: Attractive MJF venue. One of the integral attractions of the MJF is its ability to provide a beautiful festival environment located between the mountains at the shores of the Lake of Geneva. Furthermore, the event demands the control of a range of infrastructure and logistics. This CAPABILITY mainly consists of the RESOURCEs *MJF buildings* and *concert logistics*.

CAPABILITY 2: Attract and feature great stars and concerts. The value of the MJF lies in the high quality artists and concerts the Festival features year for year. Therefore a core capability of the Festival is the ability to attract and contract great musicians of the jazz and broader music world. This CAPABILITY consists of the set of RESOURCES *star musicians, professional musicians* and the so-called *"Nob's Network"*. This is the founder's legendary network of connections and relationships in the music world.

CAPABILITY 3: Atmosphere & experience. One attraction of a festival is its atmosphere. The MJF achieves this by providing free concerts, events, good food and interesting stands for the visitors strolling along the Festival venue at the shores of the lake. This CAPABILITY consists of the set of RESOURCES *musicians, diverse shops, food shops.*

CAPABILITY 4: Attract people. To break even the MJF has to be able to attract a certain number of visitors and sell a certain number of tickets.

CAPABILITY 5: Mobilize volunteer staff. Because of the MJF's size it has a large need of staff in order to make the Festival turn. It would be impossible to employ all these people at market conditions and pay them market salaries. Therefore the MJF relies on 1'200 volunteers motivated by the festival atmosphere and free concert entries. This CAPABILITY consists of the RESOURCE *staff.*

VALUE CONFIGURATION

The VALUE CONFIGURTATION describes the MJF's main ACTIVITYies and how they relate to each other. The MJF basically functions as a value network (cf. section 4.4.3) as it connects festival visitors with musicians or visitors with sponsors. The MJF is a place that brings music and music lovers together in a beautiful setting. A value network has the three main activity types, which are network promotion and contract management, service provisioning and network infrastructure operation. Accordingly the MJF's ACTIVITYies can be classified among these three categories (cf. Figure 56).

{Network promotion and contract management}

ACTIVITY 1: Contracting musicians (see Illustration Box 18 for a detailed view). The probably most important activity to make the MJF a premium event is the contracting of musicians. Every year the Festival organization, with its charismatic Claude Nobs at the head, succeeds in bringing famous stars

of all musical genres to Montreux. Among many others, the 2003 event featured stars, such as Cassandra Wilson, Radiohead, Craig David and The Roots.

ACTIVITY Name: Contracting musicians

Description: The probably most important activity to make the MJF a premium event is the contracting of musicians. Every year the festival organization, with its charismatic Claude Nobs at the head, succeeds in bringing famous stars of all musical genres to Montreux.

Configuration type: Value Network

Activity level: Primary

Activity nature: Network promotion and contract management

Executed by ACTOR: MJF

ACTIVITY shares RESOURCE: Nob's network

Permanent staff

Illustration Box 18: Detailed View of the seizing of an ACITITY

ACTIVITY 2: Contract sponsors. In order to make the MJF possible the management has to bring in powerful sponsors that financially support the event. The relationship between the MJF and contracted sponsors often goes beyond the event itself. A sponsor is affiliated to the general communication of the Montreux Jazz Festival: this can mean a yearlong involvement in diverse circumstances.

ACTIVITY 3: Ticketing. Selling tickets means selling a service that will connect the musicians with their fans and concert goers during a concert at the MJF.

ACTIVITY 4: Advertising the MJF. Promoting the MJF is essential in order to attract enough people to the Festival and to reach the breakeven point. On the one hand this means advertising the concerts and on the other hand it means promoting the MJF off.

{Service provisioning}

ACTIVITY 5: Concerts. One of the main services provided during the MJF are of course the concerts at the MJF "on" and "off".

ACTIVITY 6: Food & beverages. Crucial to the atmosphere of the MJF is its large variety of international food stands pampering the festival goers with fancy foods from around the world. Besides, at the 2003 event 75,000 bottles of mineral water were consumed in which the hot weather and maybe the spicy food certainly played a role. Alcohol sales also skyrocketed. In numbers this means that alcohol sales included 7'200 litres of beer per day (making a total of 2'500 barrels or 140'000 litres), 8'000 litres of spirits, 70'000 bottles of alco-pops and 14'000 bottles of wine (red/white/rosé). In fact, some 1.5 km of tubing was needed to pipe the beer throughout the site bars.

ACTIVITY 7: Commerce. The MJF off features numerous commerce stands that sell articles like jewelry or services like tattooing.

ACTIVITY 8: Selling merchandise. The MJF offers its visitors and fans a panoply of merchandising goods ranging from t-shirts over posters to special CD editions of the Festival.

ACTIVITY 9: Selling recordings. The large collection of recordings and video footage is sold for worldwide TV and media broadcast.

{Network infrastructure operation}

ACTIVITY 10: Providing and maintaining MJF infrastructure. An elementary activity is the maintenance and operation of the festival infrastructure during the event. This includes a panoply of tasks like maintaining buildings, waste management, organizing drivers and much more. For example, the festival crowd generated approximately 1.5 tons of litter daily which required 3,500 bin bags (of 150 litre capacity) to dispose of.

ACTIVITY 12: Production(Recording Concerts). During the festival the MJF staff includes a highly experienced sound recording team, camera team and director that produce great images and recordings

of the event. In addition to filming to feed the screens beside the stages, the team produces a large amount of video footage of the MJF stored for further use.

ACTIVITY 12: Managing Jazz currency. An important activity and infrastructure of the MJF's revenue streams is the management of a special Festival currency, the co-called JAZZ. This currency exists in an electronic and coin version and is obligatory for the purchase of food, drinks and goods during the MJF event. The currency is a means to control theft, the turnover of stands, and the corresponding transaction cuts (cf. partnering with stands).

ACTIVITY 13: Managing and coordinating volunteers. Approximately 1,200 volunteers in 35 areas contributed to the success and the functioning of the MJF 2003. 580 of these were students and the rest were either Swiss nationals or EU citizens. Managing them correctly is a crucial task.

PARTNER NETWORK

The MJF can only take place because it relies on a strong partner network. The fields of partnering embrace seven areas.

PARTNERSHIP 1: Artists. Most important, the MJF 2003 contracted and partnered with about 300 artists including 36 groups in the Stravinski Auditorium, 11 Djs and 49 groups in the Miles Davis Hall and 14 groups at the Casino. The Festival Off program welcomed 227 bands and the Montreux Jazz Café had 33 Djs. By the way, the artists used the 60 chauffeurs provided by the MJF, making around 700 trips and covering some 100,000 kilometres. A detailed view of this PARTNERSHIP is shown in Illustration Box 19.

PARTNERSHIP Name: Artists

Description: Most important, the MJF 2003 contracted and partnered with about 300 artists including 36 groups in the Stravinski Auditorium, 11 Djs and 49 groups in the Miles Davis Hall and 14 groups at the Casino. The Festival Off program welcomed 227 bands and the Montreux Jazz Café had 33 Djs.

Reasoning: {Acquisition of resources}: The MJF enters a partnership with artists for a short period of time. During this time the artists represent a RESOURCE for the concerts and events of the Festival.

Strategic importance: {5}: Artists have a very high strategic importance for the Festival because the brand stands and falls with name of the performing artists.

Degree of integration: {0}: There is no degree of integration.

Degree of competition: {0}: There is competition between MJF and artists.

Substitutability: {3}: Substitutability is relatively high as there is a large number of artists on the market. However, substitutability decreases from the time a contract is signed until the Festival, as substitutable stars will already have made their tour schedules.

Composed of a set of AGREEMENTs:

- Star contract
- "off" contract

PARTNERSHIP with ACTORs: Artists

Illustration Box 19: Detailed view of a PARTNERSHIP

PARTNERSHIP 2: Sponsoring. The sponsors are the principal Festival partnerships. Their alliance with the festival goes beyond the event itself. A sponsor is affiliated to the general communication of the Montreux Jazz Festival: this can mean a yearlong involvement in diverse circumstances. At the MJF 2003 the sponsors were Barclay, UBS, Heineken, Chrysler, Genevoise, NAGRA (Kudelski Group), Manor, Bluewin, Extrême (Frisco).

PARTNERSHIP 3: Shops, food and beverage. The stands that open up during the MJF are an integral part and contributor to the festival atmosphere. Those situated in a specific perimeter of the main Festival building actually enter into a tight partnership with the Festival and agree to transfer a percentage of their revenues to the MJF. They also agree to only accept the MJF currency, the so-called JAZZ, in order to monitor revenue cuts.

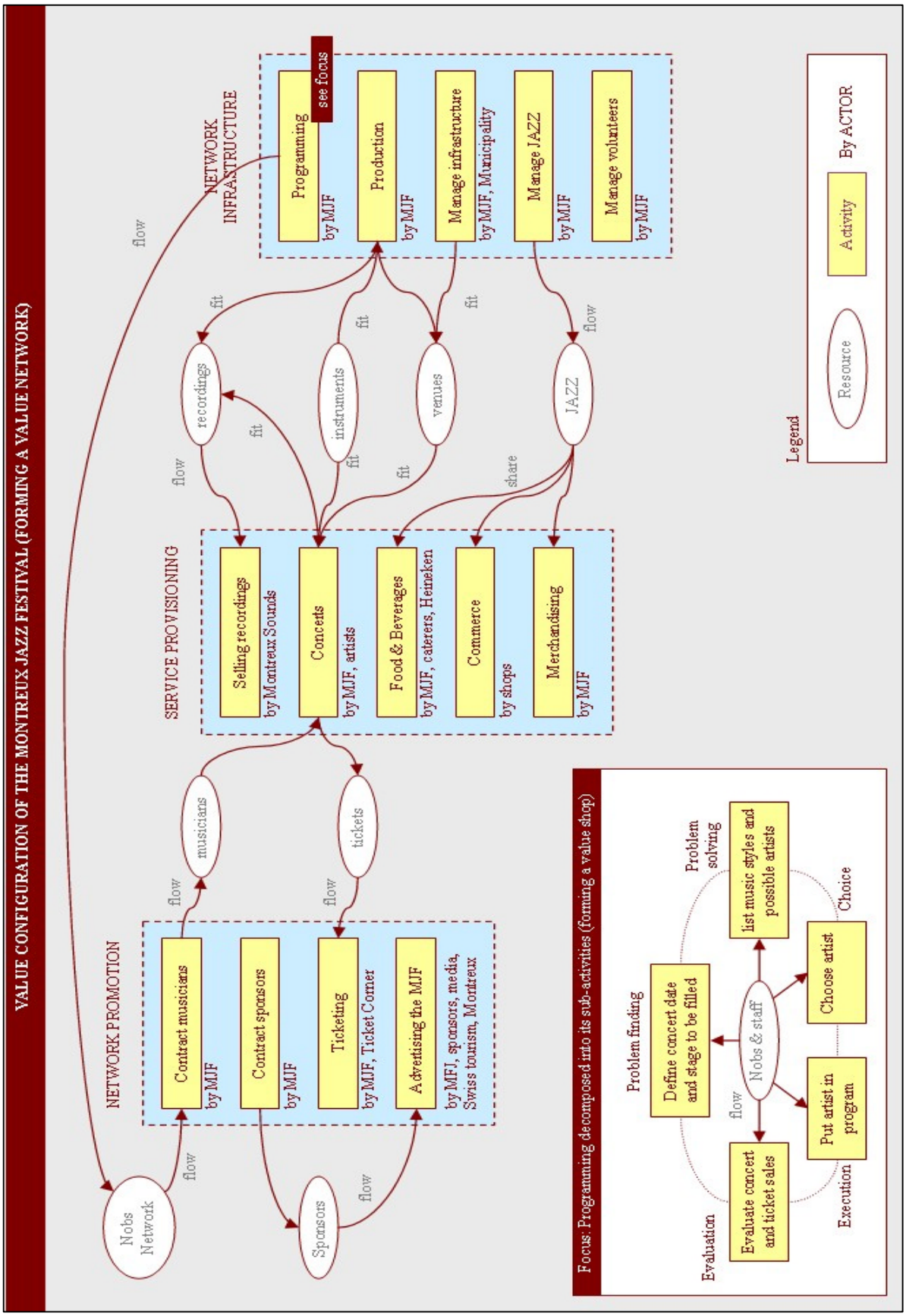


Figure 56: Montreux Jazz Festival Value Configuration

PARTNERSHIP 4: Volunteers. Volunteers become partners of the Festival because with their ubiquity, enthusiasm and goodwill for the Festival they substantially contribute to its success. In exchange for their services volunteers get free entries to all concerts, reductions on merchandising articles and a daily indemnity.

PARTNERSHIP 5: Media. As the name suggests they are directly linked to a medium of communication and are therefore vehicles for the promotion of the Festival. There are four types of Festival media partners: Internet, print media, radio and television. Each has an agreement that reflects the specific nature of their network, the frequency of broadcasts and the inherent possibilities of their medium. At the MJF 2003 media partners included Le Matin, Schweizer Illustrierte, Time, Rolling Stone, Télévision Suisse Romande TSR, TV5, Radio Suisse Romande RSR, Couleur3, Marvel Communications.

PARTNERSHIP 6: Infrastructure. During the Festival time infrastructure needs of the MJF logically skyrocket. Consequently, the MJF enters a number of partnerships to satisfy these needs.

PARTNERSHIP 7: General Festival partners. A general partner's presence is closely linked to a product or brand. A partnership contract consists of an exchange of services between the provider and the MJF. A partner offers and provides their product in accordance with the given conditions and receives in return exclusive rights for that product on site as well as visual exposure in proportion to their level of involvement.

PARTNERSHIP 8: Friends of the Festival. The "Friends of the Montreux Jazz Festival Association" was founded in 1978 with the aim of providing constant support for the producers and coordinators of the MJF. Recently restructured, it is now capable of directly financing a concert or event linked to the Festival.

PARTNERSHIP 9: Musical partners. Music instruments partners are not just involved with the performers or the venues. Their presence is closely connected to the material that they put at the Festival's disposition. They also manage all technical aspects.

PARTNERSHIP 10: Montreux municipality. The Montreux Municipality offers the MJF a wide range of free services because the event has a large and beneficial impact on the region. The municipality invests around 1 million Swiss francs in the event. Besides covering the rent of the main buildings of the Festival it organizes among other things security, waste disposal and traffic and parking regulation.

5.1.5 Financial Aspects

This section simply shows how the MJF makes money. It outlines the Festival's REVENUE MODEL and its COST STRUCTURE.

REVENUE MODEL

The MJF has two REVENUE MODELS. The first, most important one, concerns the 16 day long annual Festival in Montreux. The second one concerns annual revenues indirectly linked to the annual event.

Festival revenues. These are all the revenues directly generated during the Festival period.

> *Ticket sales*. The MJF sold a total of 94'300tickets ranging from CHF 40.- to CHF 120.- according to event and seat category. This can be broken down to 59'100 tickets for the Stravinski Auditorium (98% of capacity), 23'080 for the Miles Davis Hall (68%), 6'800 for the Casino (88%), 4'600 the MJF Boats (100%), and 720 for the MJF Trains (96%). {41% of revenues}{type: selling}
>
> *Sponsor revenues*. Sponsor contracts are an important source of income for the MJF. The sponsors pay a fixed fee for their affiliation to the Festival visual identity, privileged visibility and a range of services. {20% of revenues }{type: advertising}
>
> *Food & Beverages*. The MJF partners that do the catering and operate the food stands assign a part of their revenues to the Festival. These revenue cuts are carried out and controlled through the JAZZ currency. Beverage sales are entirely controlled by the MJF and offered in

partnership with Heineken. {28% of revenues }{type: revenue cut}

Merchandising. Every year the MJF produces a new series of merchandising articles in line with the annually changing Festival graphical appearance of which the MJF poster is the nucleus. Over the years a number of famous or raising artists have designed the graphical line, including Keith Haring and Andy Warhol. {5% of revenues }{type: selling}

Annual revenues. These are all the revenues that occur throughout the year.

Licensing of recordings. Since 1988, Montreux Sounds SA, owners of the Montreux Jazz Festival archives, have accumulated a large collection of video footage for worldwide TV and media broadcast that can be licensed for a fee. Montreux Sounds shares these revenues with the MJF. {4% of revenues }{type: revenue cut}

Diverse. Diverse revenues include growing revenue streams such as franchising and licensing offered through the Sunset Music subsidiary. {2% of revenues }{type: franchising}

COST STRUCTURE

The MJF has two COST STRUCTURE that cover all the expenses of the MJF's business models and classifies them among a number of ACCOUNTS.

COST STRUCTURE 1: Direct costs. {79% of total costs}

ACCOUNT 1: Infrastructure. {20%}

ACCOUNT 2: Artists. {29%}

ACCOUNT 3: Food & Beverages. {10% of direct costs }

ACCOUNT 4: Merchandising. {2% of direct costs }

ACCOUNT 5: Production. {16% of direct costs }

ACCOUNT 6: Diverse. {2% of direct costs }

COST STRUCTURE 2: Running costs. {21% of total costs }

ACCOUNT 7: Fixed costs. {15% of running costs}

ACCOUNT 8: Promotion and marketing. {4% of running costs }

ACCOUNT 9: Diverse. {2% of running costs }

5.1.6 Business Model Actors

A certain number of ACTORS are involved in the MJF's business model. These are:

ACTOR 1: Artists. The musicians, groups and DJs are central actors to the Festival.

ACTOR 2: Media. Media actors play an important role before, during and after the Festival.

ACTOR 3: Sponsors. Sponsors are involved in the promotion of the MJF and profit from its image.

ACTOR 4: Montreux municipality. As a former owner and organizer of the Festival the Montreux municipality has continued to be substantially involved in the MJF.

ACTOR 5: Volunteers. The festival stands and falls with the volunteers that are omnipresent.

ACTOR 6: F&B. This includes caterers and the brewer Heineken that take care of F&B.

ACTOR 7: Merchants. Merchants belong to the MJF off actors and populate the promenades.

ACTOR 8: Montreux Sounds Records. This company created in 1995 manages the MJF recordings database and the licensing rights.

ACTOR 9: Sunset Music. This company has been created to sell and market the MJF brand worldwide.

ACTOR 10: Swiss tourism's "Top Events of Switzerland" TEOS. This is marketing alliance of seven world famous Swiss events in culture and sports. It groups the MJF with Gstaad (tennis), Locarno

(film), Basel (art), Lucerne (music), Crans Montana (golf) and St.Moritz (polo).

ACTOR 11: IJFO International Jazz Festivals Organization. The IJFO is an umbrella organization to currently 12 leading jazz festivals worldwide that partner to create synergies.

ACTOR 12: SMPA Swiss Music Promoters Association. The SMPA is an association of the 22 biggest concert organizers in Switzerland that promotes common concerns and does lobbying at the institutional level.

6 APPLICATION PROTOTYPES: BM²L

As described in section 1.2 the business model ontology aims at being a generic framework to describe and capture any possible business model. Because the process of capturing a business model is largely facilitated by using a formalized language I introduce the so-called Business Model Modeling Language BM²L. This is nothing else than a codification of the ontology with an eXtensible Markup Language XML structure, XML being a meta-language to describe information. BM²L can then serve to describe and capture a specific business model. I have used it to seize the entire Montreux Jazz Festival business model (see www.hec.unil.ch/aosterwa/PhD).

6.1 FROM THE ONTOLOGY TO A FORMAL MARKUP LANGUAGE

As it seemed appropriate to translate the business model ontology into a formal description language and as the eXtensible Markup Language XML has rapidly become the first choice for defining document and data interchange formats I have chosen this technology to formalize the business model ontology.

In fact XML already has a strong foothold in business, especially in business transactions and particularly in e-business. Many existing technologies are being re-engineered to take advantage of XML's qualities such as interoperability and reusability (Dumbill 2001). A multitude of XML consortiums and projects (e.g. xCBL, cXML) intend to rewrite the concepts of the aging Electronic Data Interchange (EDI) with XML syntax for business applications on the Internet (Haifei Li 2000). One of the most important projects is the joint initiative of Organizations for the Advancement of Structured Information Standards (OASIS) and the UN's Center for Trade Facilitation and Electronic Business (UN/CEFACT). It focuses on enabling transactions across industries and businesses, particularly smaller companies, generally left out of EDI in the past (Kotok 2001).

However, XML is not limited to transaction purposes and can serve a wide range of other goals (Fensel 2001). XML is a metalanguage, which means that it is a standardizing format for describing structured and semi-structured information for a wide area of applications. XML provides a means of including metadata (i.e. data on data) in documents. This makes it ideal for my purpose of describing a business model in a formalized manner. Thus, based on the business model ontology I developed BM²L to formally describe business models. Contrary to most existing xml languages in business that represent structures for the exchange of transaction-oriented messages or documents, BM²L focuses on the representation of a company's business model. Rather than concentrating on e-business processes, like for example the Electronic Business using eXtensible Markup Language, short ebXML (ebXML 2003), BM²L is situated at a higher level of abstraction, the one of the business model/business logic of a firm. BM²L aims at making it possible to encode the business model of any given company. Concretely, a business model expressed in BM²L is an XML document that respects the constraints and the rules imposed by an XML schema based on the business model ontology. An XML schema is a model that describes the logical structure of an XML document. First attempts to formalize the ontology in an XML-based language were already made at the beginning of this research (Ben Lagha, Osterwalder et al. 2001).

Such a formal representation and the multitude of existing tools to manipulate XML documents have a number of advantages. It becomes easy to verify the validity of a business model to the business model ontology. Different business models can be compared or can be evaluated to one another. Generating different views (such as specific documents) in function of different needs (such as descriptions, graphical representations, business plans, reports for financing, reports for eventual partners, acquisitions or mergers, etc.) becomes possible. Furthermore, XML's platform independence make the maintenance and the exchange of business models in heterogeneous IT

environments a lot easier.

In short I have chosen XML for the following reasons. Because it is:

- a language to describe structured and semi-structured information
- an open standard (i.e. it is not proprietary and owned by a company) and recommendation of the World Wide Web Consortium (W3C).
- platform independent
- machine readable and can be used by different applications
- reusable
- transformable (e.g. to different formats such as HTML or PDF)
- a metalanguage that facilitates exchange
- a metalanguage that has open standards for visualization (Scalable Vector Graphics SVG)

Similarly, Fensel (2001) argues that XML represents an interesting solution of knowledge management and electronic commerce. The main reasons are that XML helps defining a language for describing the structure and semantics of data, it is a language for processing data and it is a protocol for exchanging data.

6.2 THE BUSINESS MODEL MODELING LANGUAGE BM²L

BM²L is defined by an XML schema. It is composed of a number of concepts (called elements) and attributes that represent the vocabulary of the ontology and the relationships between the elements. Together they stand for the construction rules of a business model. In other words, BM²L defines the semantics and the syntax of the elements. The elementary elements are found on the lowest hierarchical level and contain a textual description of the concepts they represent. The content of each element is delimitated by an opening tag in the form of <element> and a closing tag in the form of </element> and can have a set of attributes.

To create the BM²L schema and to capture business models I have opted for a set of tools provided by the Austrian company Altova. The privately held company was founded in 1992 and has been actively involved in the XML market from the early conception of XML. Altova's main tool, xmlspy, is one of the market leaders in XML editing and offers an appropriate toolset for the goals I pursue.

Concretely, BM²L translates the business model ontology's semantics and syntax into an XML based language defined by an XML schema. It can then be applied to a real world business model, as I have done to capture the business logic of the Montreux Jazz Festival (see annex at www.hec.unil.ch/aosterwa/PhD).

Figure 57 illustrates the syntax of a VALUE PROPOSITION's elements in BM²L (cf. section 4.2.1 on VALUE PROPOSITION). In the following lines I describe the XML schema of the VALUE PROPOSITION part in natural language, which might be a bit dull, but it will help to understand what I have exactly done in BM²L. As Figure 57 shows, a company can have one or more VALUE PROPOSITIONs. Thus, the BM²L schema defines that a BM²L document can contain 1-n VALUE PROPOSITIONs expressed in an envelope of a <ValueProposition> opening tag and a </ValueProposition> closing tag. The content of the envelope is composed of a <ValuePropositionCharacteristics> and an optional <SetOfOfferings>. A <ValueProposition> has three attributes, from which one, ValuePropositionID, is its identifier. The other two attributes, AddressesCustomerIDREF and BasedOnCapabilityIDREF, reference the TARGET

CUSTOMERS the VALUE PROPOSITION addresses, respectively the CAPABILITIES on which it relies.

The <ValuePropositionCharacteristics> envelope contains a sequence of elements that describe the VALUE PROPOSITION. These are two textual elements, <Name> and <Description>, followed by the complex element <Reasoning> describing why the VALUE PROPOSITION is valuable to a customer. A complex element is an element that is composed of sub-elements. <Reasoning> is constituted by a sequence of 0-n elements containing text, which are <Use>, <Risk> or <Effort>. The next element after <Reasoning> is the <ValueLevel> tag, which describes the value level of a VALUE PROPOSITION. It is composed of either <MeToo>, <InnovativeInnovation>, <Excellence> or <Innovation>. <ValueLevel> is followed by <PriceLevel>, describing the price level of a VALUE PROPOSITION. It is composed of either <Free>, <Economy>, <Market> or <HighEnd>. <ValuePropositionCharacteristics> ends with an optional <LifeCycle>, which's attribute LifeCyclePhase defines in which phase the VALUE PROPOSITION creates value.

If a VALUE PROPOSITION is decomposed into a set of OFFERINGS, the <ValuePropositionCharacteristics> tag is followed by the <setOfOfferings> envelope. A <setOfOfferings> is a sequence of 1-n <Offering> that have an identifying attribute OfferingID. An <Offering> is composed of <OfferingCharecteristics> and of an optional <SetOfOfferings> if it is decomposable. <OfferingCharecteristics> is the same type as <ValuePropositionCharacteristics> and contains the same sub-elements, except that <LifeCycle> becomes cumpolsery.

In Figure 58 you can see how this structure is concretely applied when one describes a business model with BM²L. It illustrates parts of the Montreux Jazz Festival's VALUE PROPOSITION encode with BM²L.

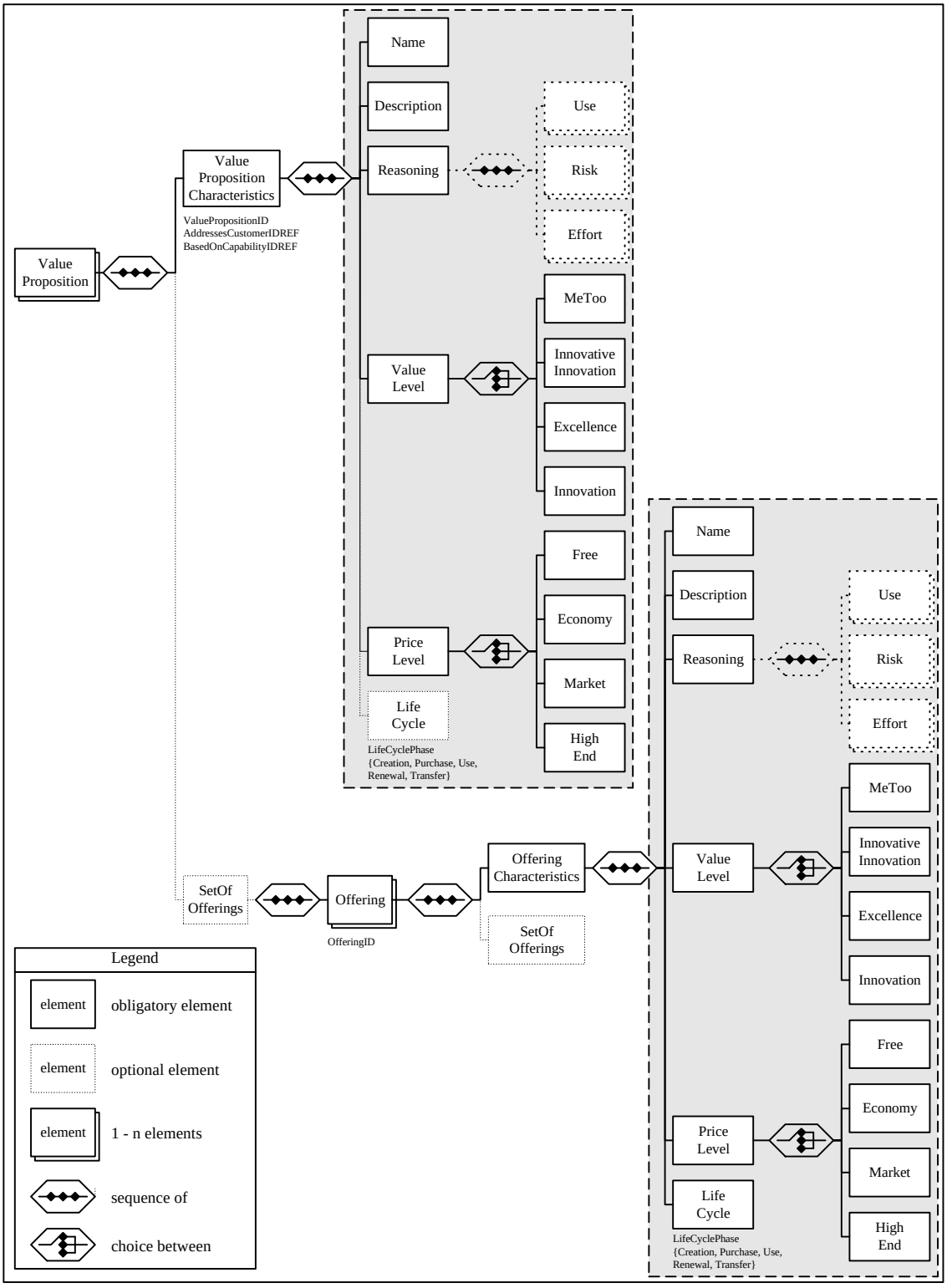


Figure 57: Diagram BM2L /XML schema VALUE PROPOSITION

```
<Product>
    <ValueProposition ValuePropositionID="vp1" BasedOnCapabilityIDREF="cp4 cp3 cp1"
    AddressesCustomerIDREF="tc4">
        <ValuePropositionCharacteristics>
            <Name>MJF Concerts</Name>
            <Description>The main attraction and VALUE PROPOSITION of the MJF are its prestigious
            concerts with stars from jazz, pop, rock, hip-hop and more. The MJF has made itself a name
            with the regular by unforgettable jazz musicians like Miles Davis, Keith Jarett, Charlie Mingus,
            Ella Fitzgerald and later from other fields like Bob Dylan, Phil Collins or Guru's Jazzmatazz.
            The 2003 event featured artists across the musical range, such as George Benson, Joao Gilberto,
            Simply Red or Cypress Hill. </Description>
            <Reasoning>
                <Use>For the customer the value essentially lies in going to the concert of the artist of
                his choice.</Use>
            </Reasoning>
            <ValueLevel>
                <MeToo>The MJF may be special because of its quality but it is not substantially
                different from other jazz festivals throughout the world.</MeToo>
            </ValueLevel>
            <PriceLevel>
                <Market>The MJF ticket prices are comparable to the market prices of what is paid for
                other concerts.</Market>
            </PriceLevel>
        </ValuePropositionCharacteristics>
        <SetOfOfferings>
            <Offering OfferingID="off10">
                <OfferingCharacteristics>
                    <Name>MJF evening concerts</Name>
                    <Description>The evening concerts comprise the major event of payable concerts
                    on three different stages, the Stravinski Auditorium, the Miles Davis Hall and the
                    Casino.</Description>
                    <Reasoning>
                        <Use>MJF concerts are of great quality.</Use>
                    </Reasoning>
                    <ValueLevel>
                        <MeToo>This offer competes with other concerts and
                        festivals.</MeToo>
                    </ValueLevel>
                    <PriceLevel>
                        <Market>Ticket prices are between CHF 40.- to CHF 120.- and
                        comparable to other concerts and festivals. </Market>
                    </PriceLevel>
                    <LifeCycle LifeCyclePhase="Use"/>
                </OfferingCharacteristics>
            </Offering>
            <Offering OfferingID="off2">
                <OfferingCharacteristics>
                ...
                </OfferingCharacteristics>
            </Offering>
            ...
        <SetOfOfferings>
    </ValueProposition>

    <ValueProposition>
    ...
    </ValueProposition>
```

Figure 58: Excerpt of the product part of the BM²L document of the MJF

6.3 TRANSFORMING XML DOCUMENTS

In section 6.2 I have demonstrated how the BM²L schema (i.e. its structure) is conceived, how a BM²L document looks like and how it can capture a business model. In the following, I demonstrate some of the potential usages that become possible once one has seized a business model with BM²L.

For example, XML documents can easily be transformed into a variety of formats, such as HTML used to display web pages or PDF, the de facto standard for documents on the web. In fact, XML documents and structures can be transformed to any other structure and formatting. The standard way to describe how to transform (i.e. change) the structure of an XML document into an XML document with a different structure and presentation is called XSL Transformation (XSLT). Like XML, XSLT is an open standard and recommendation of the World Wide Web Consortium (W3C). XSLT can be thought of as an extension of the Extensible Stylesheet Language (XSL). XSL is a language for formatting an XML document, in order to display it, for instance as a web page. XSLT shows how the XML document should be reorganized into another data structure. Concretely, XSLT is used to describe how to transform the source data structure of an XML document into a new XML document, which can have a completely different data structure.

Figure 59 illustrates how a transformation works. An XML document is fed to an XSL processor that will parse the document structure. Then the processor transforms and formats the document according to an XSL stylesheet and emits a new document. This process is quite powerful as it allows to select specific information of the input document to put into the new document. In other words, XSLT allows not only to create different output formats such as HTML or PDF but also to select different contents of the input document for the various output documents.

Applying this to the concept of the business model ontology this means that if one has seized a business model with BM²L one can easily generate different documents tailored to specific needs. A venture capitalist might want a two-pager to compare different business models while an executive in a company may need a 10 page report to understand a business model and make decisions. And the business process designer might want a really detailed 50 page report to be able to engineer processes and workflows.

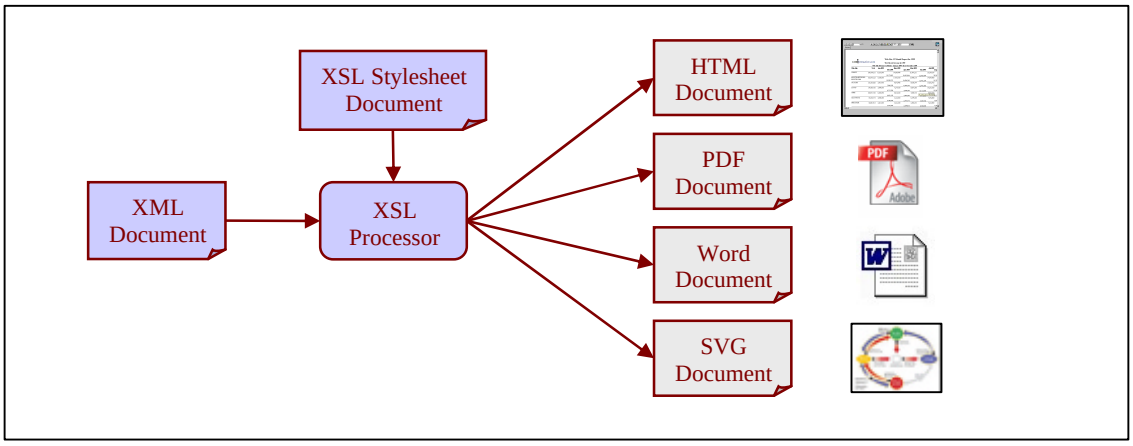


Figure 59: XSL Transformation

6.4 VISUALIZING A CHANNEL STRATEGY WITH SCALABLE VECTOR GRAPHICS SVG

In this section I demonstrate how XSLT can be used to transform parts of a BM²L document into a graphical representation. I aim at automatically generating a visual illustration of the channel

strategy of a company by extracting the information on channels in the BM²L document and transforming them into a visual form. To achieve this I apply the transformation capabilities of XML addressed in section 6.3 to a BM²L document by conceiving a XSL stylesheet and feeding them to an XSL processor (as illustrated in Figure 60).

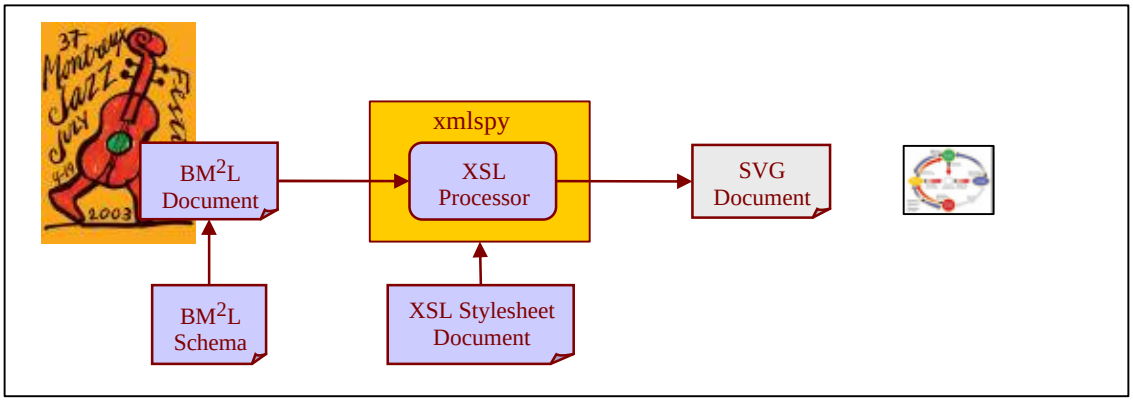


Figure 60: Transformation from BM2L to SVG

The generated image of a company's channel strategy is saved as a Scalable Vector Graphics (SVG) document. SVG is simply the description of an image in XML. Any program such as a web browser that recognizes XML can display the image using the information provided in the SVG format.

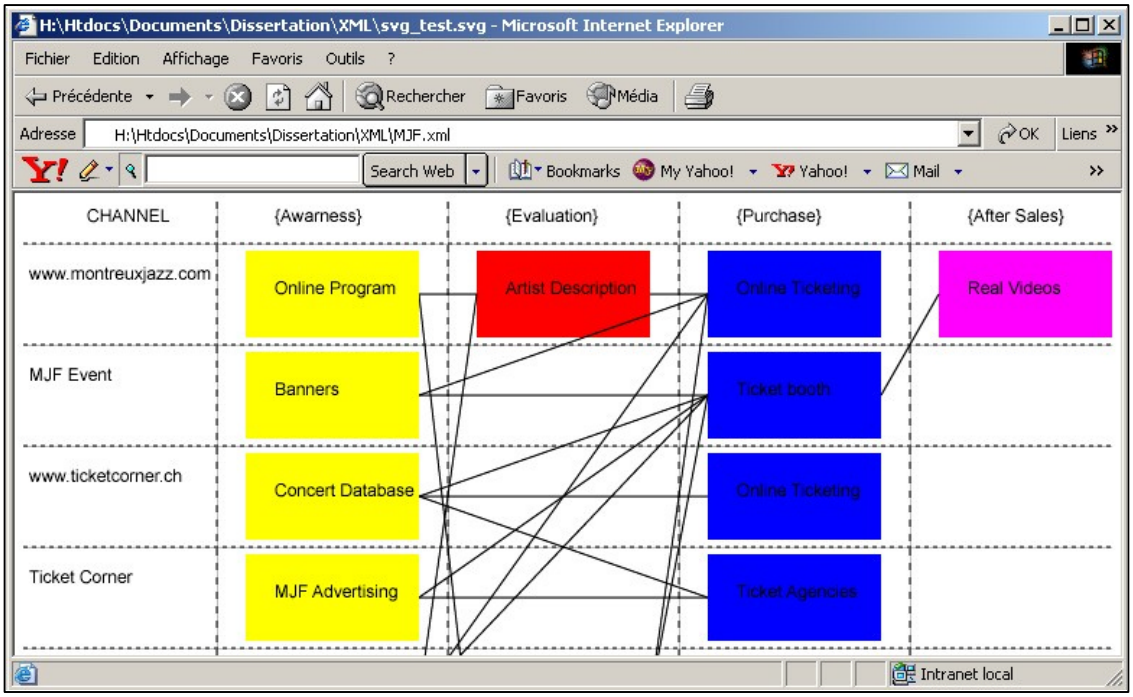


Figure 61: SVG screenshot of channel strategy

In a nutshell, I applied an XSL document (cf. excerpt Figure 62) to the MJF case seized in BM²L and got a SVG document (cf. excerpt Figure 63). This outcome can be read by a web browser and gives me a graphical representation of a company's distribution channels (see Figure 61). The goal of this is to achieve a rapid understanding of a part of a business model, in this case channels, through visualization (cf. section 2.4.1 on visualization).

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
xmlns:fo="http://www.w3.org/1999/XSL/Format">

<xsl:template match="/">
<xsl:apply-templates select="./BusinessModel/Customer"/>
</xsl:template>

<xsl:template match="Customer">
<svg xmlns:xlink="http://www.w3.org/1999/xlink" height="800px" width="800px" onload="init(evt)"
viewBox="0 0 800 800">
        <line y2="35" x2="760" y1="35" x1="6" stroke-dasharray="3" stroke="black"/>
    <text y="20" x="50">CHANNEL</text>
    <line y2="472" x2="140" y1="6" x1="140" stroke-dasharray="5" stroke="black"/>
    <text y="20" x="180">{Awarness}</text>
    <line y2="472" x2="300" y1="6" x1="300" stroke-dasharray="5" stroke="black"/>
    <text y="20" x="340">{Evaluation}</text>
    <line y2="472" x2="460" y1="6" x1="460" stroke-dasharray="5" stroke="black"/>
    <text y="20" x="500">{Purchase}</text>
    <line y2="472" x2="620" y1="6" x1="620" stroke-dasharray="5" stroke="black"/>
    <text y="20" x="660">{After Sales}</text>

    <xsl:for-each select="./DistributionChannel">
        <xsl:call-template name="DistributionChannel"/>
    </xsl:for-each>
 </svg>
</xsl:template>
```

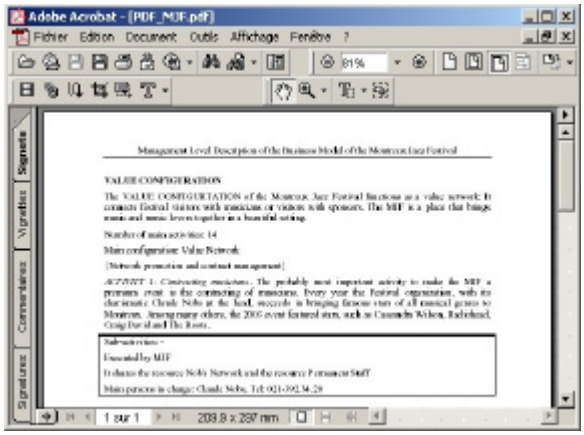
Figure 62: Excerpt of the XSL document

```
<?xml version="1.0" encoding="UTF-8"?>
<svg xmlns:fo="http://www.w3.org/1999/XSL/Format" xmlns:xlink="http://www.w3.org/1999/xlink"
height="800px" width="800px" onload="init(evt)" viewBox="0 0 800 800">
    <line y2="35" x2="760" y1="35" x1="6" stroke-dasharray="3" stroke="black"/>
    <text y="20" x="50">CHANNEL</text>
    <line y2="472" x2="140" y1="6" x1="140" stroke-dasharray="5" stroke="black"/>
    <text y="20" x="180">{Awarness}</text>
    <line y2="472" x2="300" y1="6" x1="300" stroke-dasharray="5" stroke="black"/>
    <text y="20" x="340">{Evaluation}</text>
    <line y2="472" x2="460" y1="6" x1="460" stroke-dasharray="5" stroke="black"/>
    <text y="20" x="500">{Purchase}</text>
    <line y2="472" x2="620" y1="6" x1="620" stroke-dasharray="5" stroke="black"/>
    <text y="20" x="660">{After Sales}</text>
    <text y="60" x="10">www.montreuxjazz.com</text>
    <line y2="105" x2="760" y1="105" x1="6" stroke-dasharray="3" stroke="black"/>
    <line y2="420" x2="320" y1="70" x1="280" stroke="black" stroke-dasharray="solid"/>
    <line y2="70" x2="320" y1="70" x1="280" stroke="black" stroke-dasharray="solid"/>
    <rect height="60" width="120" y="40" x="160" fill="yellow"/>
```

Figure 63: Excerpt of the SVG document

6.5 GENERATING A REPORT IN PDF

Building on the same transformation capabilities as demonstrated in the previous example with SVG one can also imagine the generation of a specific report from a business model seized with BM²L. Such a report could resemble the business model overview presented in section 5 or could be more detailed according to particular needs.



Different communications ask for different document types with different information. These can easily be generated, for example as PDF documents, from the basic business model description captured in BM²L. These could target:

- managers
- employees
- customers
- investors

Figure 64: screenshot of the PDF report

6.6 CONCLUDING: WHY USE BM²L

For this dissertation BM²L has become more than just a simple prototype and instantiation of the business model ontology. It was a truly practical tool that helped me asses the Montreux Jazz Festival case study. Having solely worked with the structure of the ontology and a word processor to capture the MJF's business logic at the beginning I decided to design BM²L to simplify the task. To seize a business model formally and to take into account elements, attributes and relationships can be quite cumbersome and complicated without computer assistance. But on the other hand computer assistance for capturing business models only becomes possible after formalizing the concepts and making them computable.

BM²L in combination with the off-the-shelf XML tool xmlspy is comparable to a CASE tool (Computer Assisted Software Engineering) in software or process development. Among other things CASE tools particularly help to seize, manage and analyze complex projects. Though a simple prototype, BM²L already makes it possible to seize business models and makes first modest steps in the direction of analysis (e.g. visualization of complexities).

Pursuing this direction further would include the development of a real business model design tool with a graphical interface assisting the designer in capturing and designing elements, attributes and relationships. The next step would involve adding analyzing and management capacities. Some of these ideas that could be based on BM²L are outlined in section 1 on ontology applications and further research.

Concluding, it can be said that introducing BM²L has made things easier in regards of capturing business models. In my opinion further researching the design and use of similar tools would be a genuine step forwards in business model research, as they could also be tested in management settings.

7 EVALUATION

As addressed in the methodology section (see 1.3) design science must include some form of validation of the research outputs. In other words constructs, models, methods and instantiation built or designed in a first step should be evaluated with an appropriate method according to the initial goals of the research. According to March and Smith (1995) the evaluation of constructs tends to involve completeness, simplicity, elegance, understandability and ease of use. The evaluation of models should be done in terms of their fidelity with real world phenomena, completeness, level of detail, robustness, and internal consistency. Furthermore, to inform researchers in the field, the new model must be positioned with respect to existing models. They also point out that often existing models are extended to capture more of the relevant aspects of the task. Evaluating instantiations proves difficult because it is difficult to separate them from constructs, models, and methods which they embody. And finally March and Smith mention that in design science "evaluation is complicated by the fact that performance is related to intended use, and the intended use of an artifact can cover a range of tasks" (1995, p.254).

In Figure 65 I illustrate how the two basic activities of design science, build and evaluate are implemented in my research. Building is the process of designing constructs, models, methods and instantiations according to initial goals. Evaluating is the process of determining how well the constructs, models, methods and instantiations perform compared to the initial goals an by using a set of metrics.

In this dissertation I essentially concentrate on evaluating the constructs and the model (i.e. the business model ontology) as it is the major outcome and contribution of this research. Future research should include further evaluation of the ontology and of its instantiations (i.e. BM^2L and alignment). In this thesis the instantiations are simply illustrated through cases, though this at least proves their applicability.

BUILD AND EVALUATE

RESEARCH OUTPUT

	Goal	Build Outcome	Evaluation Metrics	Methodology
Constructs	Identify the relevant issues in business models	Nine business model elements	Completeness, understandability (7.1,7.2.2, 0)	Literature, interviews, student cases
Model	Describe the business logic of an enterprise formally	The business model ontology	Fidelity with real word phenomena, completeness, internal consistency (7.2.2, 7.3)	Literature, interviews, student cases, instantiation
Method		1) XML/ BM^2L 2) Alignment methods		Literature
Instantiation	Apply the ontology to a business application	1) BM^2L & Application 2) Alignment	Applicability, more to be explored and tested in further research. (7.3)	Case study, more to be explored and tested.

Figure 65: Build and Evaluate

Evaluating the business model ontology can be done through four direct qualitative methods and two indirect more quantitative methods (see Figure 66). A certain form of evaluation is provided by comparing and positioning the ontology to the literature in the field of business models as called for by March and Smith (1995). This is achieved in this dissertation by describing similarities and differences and arguing why the ontology signifies and advance in business model research. A second form of evaluation can be achieved through interviews with managers and consultants. Though this cannot evaluate a model's performance (which is rather measured through evaluating its instantiation), it can give an impression of the model's appropriateness to perform the task of describing the business logic of a firm. This research includes a set of interviews that have proven to be very interesting concerning business model use and have insofar contributed to the ontology's evaluation as they have revealed the practitioners' interest in the concept.A third form of evaluation is applying the ontology to case studies. This gives an indication of its applicability and may give a hint on its appropriateness to describe the business logic of a firm. I have applied the ontology to one instantiation, the Montreux Jazz Festival. A group of masters students have applied the overall structure of the nine elements to a set of companies Furthermore, the ontology has been used in a masters thesis to model the business model of an e-business project of a company. A fourth form of evaluation is the research community's attention given to the model. If the research community shows an interest in the ontology this probably means that at least some aspects of it constitute a certain advance in the business model domain.

The fifth and the sixth evaluation method are indirect as they happen through the ontology's instantiation. The former is testing one of the ontology's instantiations in a real-world business setting (e.g. visualization) and see how it performs. The latter is comparing the performance of one of the ontology's instantiations with another existing a method in the field. These two methods prove to be very laborious to realize and are not covered in this dissertation.

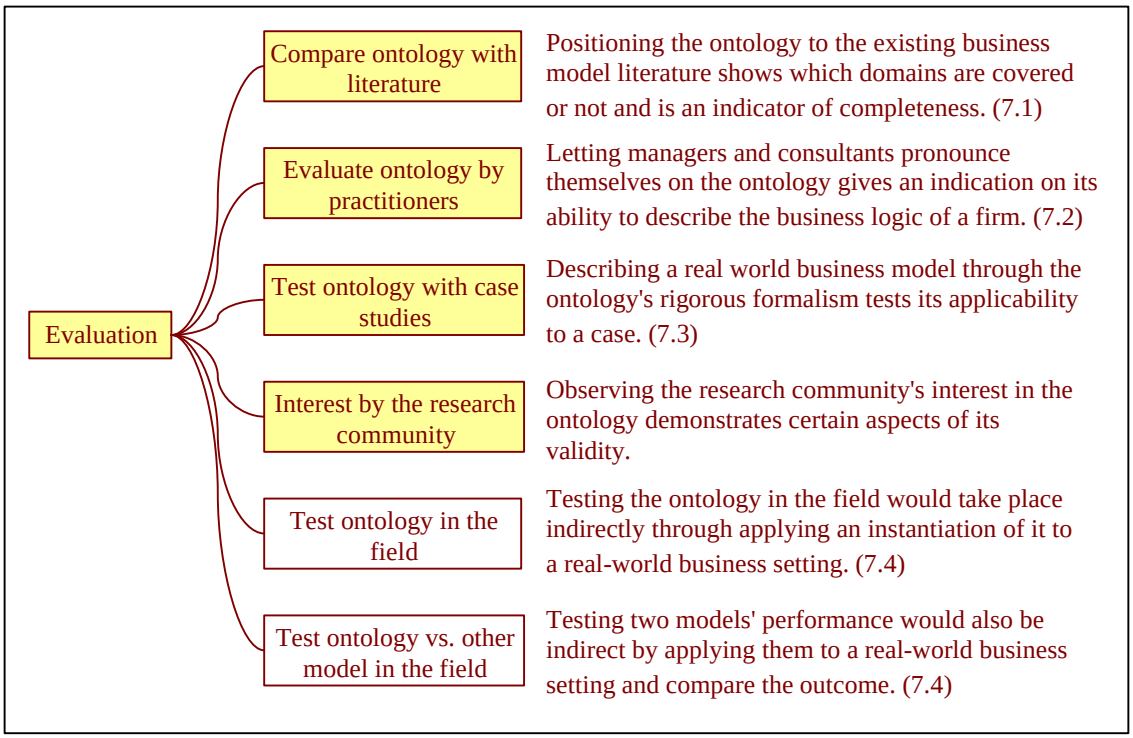


Figure 66: Evaluation Methods

7.1 LITERATURE REVIEW

March and Smith (1995, p.260) indicate that "building the first of virtually any set of constructs, model, method, or instantiation is deemed to be research, provided the artifact has utility for an important task. The research contribution lies in the novelty of the artifact and in the persuasiveness of the claims that it is effective. Actual performance evaluation is not required at this stage". Though the business model ontology is new in its formal approach to describing the business logic of a firm it must be evaluated compared to other literature in the business model domain. In the terms of March and Smith this means that because the ontology builds on and is comparable to subsequent constructs, models, methods, and instantiations addressing similar tasks it must be judged based on "significant improvement" e.g., more comprehensive, better performance. A thorough literature review as illustrated previously in section 1 and in this section in Table 42 can bring a partial answer to this inquiry, but it stays somewhat subjective. That is it demonstrates if the ontology is complete compared to the existing literature in the domain and it shows its uniqueness in covering all the relevant issues through a rigorous formal approach. Table 42 and Figure 67 illustrate what elements of the ontology are covered by other authors and how exactly they have been treated. The various authors in the business model domain define elements differently in depth and rigour. For example, Hamel's (2000) approach covers all the elements but stays relatively noncommittal on their description. On the other hand, Gordijn's (2002) value-exchange-centric model does not cover many customer-related issues but is very rigorous in defining the value configuration and value exchanges of a company. The ontology described in this dissertation claims that it models all the elements mentioned by at least two authors, notably by building on some of their contributions. Its main improvement compared to other models is that it seems to cover all the relevant issues in the business model domain through a modelling approach. Yet, this does not necessarily give any indications on its appropriateness in describing the business logic of a firm. This issue is addressed through interviews with business practitioners “in the field" and is explained in the section 7.2.

Authors/Business Model Elements 0 = element not existing 1 = element mentioned 2 = element described 3 = element modeled	Value Proposition	Target Customer	Distribution Channel	Customer Relationship	Value Configuration	Capability	Partnership	Cost Structure	Revenue Model
Stähler	2	0	0	0	2	0	2	0	2
Weill and Vitale	2	2	2	0	0	2	0	0	2
Petrovic, Kittl et al.	1	0	1	1	1	1	0	0	1
Gordijn	1	1	0	0	3	0	3	3	3
Afuah and Tucci	2	2	0	0	3	2	0	0	2
Tapscott, Ticoll et al.	0	0	0	0	3	0	2	0	0
Linder and Cantrell	1	0	1	1	1	0	0	0	1
Hamel	2	2	2	2	2	2	2	2	2
Chesbrough and Rosenbloom	1	1	0	0	1	0	0	1	0
Number of times the element is mentioned	8/9	5/9	4/9	3/9	8/9	4/9	4/9	4/9	7/9

Table 42: Business Model Literature Compared

Figure 67 graphically represents Table 42 and shows which of the nine business model elements have been used by the other relevant authors. Furthermore, the heights of the bars indicate if a specific element has been simply mentioned, described or modelled. The graphs show that the authors can be classified among three rough categories. The first contains the authors that mention a relatively large number of business model elements, but do neither describe them further, nor model them (Chesbrough and Rosenbloom 2000; Linder and Cantrell 2000; Petrovic,

Kittl et al. 2001). The second embraces the authors that go a step further and describe the elements they mention in more or less detail (Hamel 2000; Stähler 2001; Weill and Vitale 2001), whereby Hamel (2000) demonstrates a very holistic view of the business model. The last category includes the authors that either describe or conceptualize the business model elements they mention (Tapscott, Afuah, Gordijn) but leave some "business model blind spots" compared to the nine elements used in this dissertation. For example, Tapscott, Ticoll et al. (2000) though conceptualizing the Value Configuration, limit themselves to a network-centric approach.

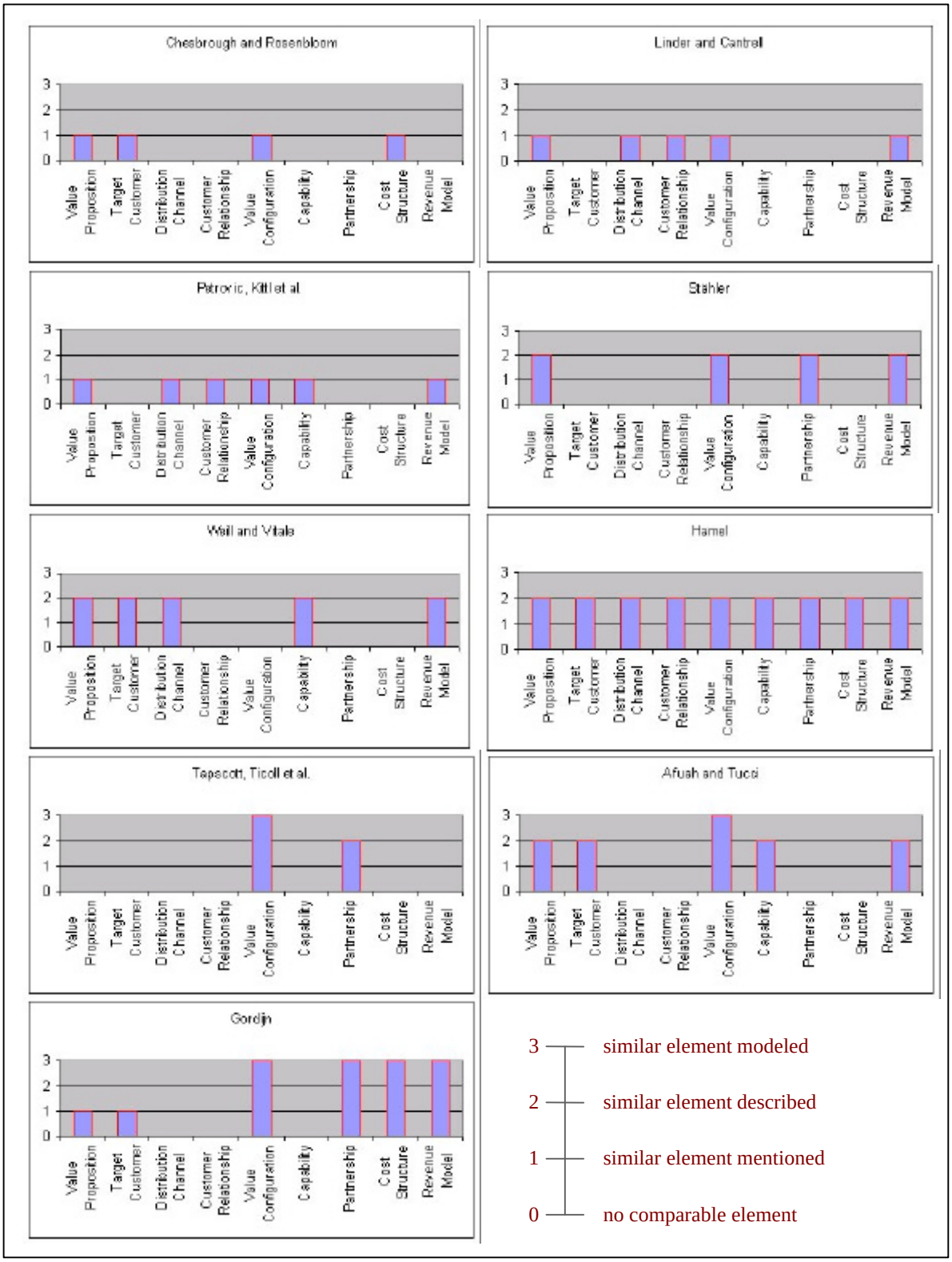


Figure 67: Business Model Literature Compared

7.2 INTERVIEWS ON BUSINESS MODELS

Between June and October 2003 I conducted a dozen 60 to 90 minutes long interviews with managers and consultants to get a feedback on this research. These were a series of semi-structured interviews that aimed at investigating the relevance of business model research, assessing the ontology's fidelity with real world phenomena (i.e. its ability to express the business model of a firm) and exploring possible uses of the business model concept.

Interrogating business people on the business model ontology is insofar problematic as it is a theoretical construct that cannot directly be evaluated by practitioners as such. To ask them if the ontology is capable of describing the business logic of a firm I had to present them some form of instantiation. Therefore I simulated a tool that could visually display the bird's eye view of easyJet's business model, its value proposition, ColorMailer's infrastructure management and Nokia's or Barnes & Noble's distribution channel strategy .

The interviews were structured into four parts (see Table 43 and www.hec.unil.ch/aosterwa/PhD for the interview template). A first part was composed of questions on the use of models, formal models and business tools in the interviewees company. The second part consisted of a short explanation of the business model ontology by presenting the simulated instantiation/tool that generates certain business model views mentioned previously. The third part was destined at discussing these views with the goal of getting an indirect feedback on the ontology's ability to present a business model and aimed at getting information on its completeness. The goal of the fourth part was to investigate in what fields the business model concept and specifically the ontology could make a contribution.

Question Domain	Questions
Questions on the use of business concepts & tools	How do you plan the general business objectives of your company? Do you use any conceptual tools to plan your business or to sketch the general direction in which your firm is heading?
	If yes, do you use any specific formalism(s) to do this?
	If yes, do you use any specific software tool to do this? If yes, which one(s)?
Demonstrations & Explanation of the Ontology	easyJet.com, ColorMailer, Barnes & Noble, Nokia
Questions on the fidelity with real word phenomena	In your opinion, what elements are missing in the model presented before?
	In your opinion, what elements should not belong to the model presented before?
	How could such a model help you define business indicators?
	How could such a model help you or a group of managers make better decisions?
	How could such a model improve some parts of strategic planning?
	How could such a model make it easier to chose and design appropriate information systems (e.g. software purchases like Customer Relationship Management or Supply Chain Management...)
	How would it be able to foster innovation in a company with such a model?
	How do you think such a model could improve business process design and engineering?
	How could it be helpful to have such a model to communicate your business model. (when making decisions, to communicate with employees)
Final discussion	Do you have any final comments?

Table 43: Business Practitioner Interview Structure

The interviewees included 8 managers from transport (1), media (1), services (4), retail (1) and industry (1) and 3 management consultants (cf. Table 44). Company sizes ranged from 3 to 3'315 employees (while the Montreux Jazz Festival peaks at a staff of 1200 people for three weeks once a year). From the companies addressed and asked to participate in the interviews only one did not

take place after initially agreeing. A general impression was that the interviewees were all quite receptive to the topic of business models. One manager of a startup company mentioned: "*I'm already happy that somebody tries to define the term business model. It was one of the most violated terms. Everything was a business model. Everybody asked me what a business model is. I could never really define it. It is good that somebody is looking at this*".

Table 44 gives an overview of the interviews depicted in the following sections, showing the interviewee's economic domain, the number of employees, the company's use of concepts and tools, as well as the use of trial & error, and, the interviewee's position concerning the questions. The questions ranged from "can the business model concept help in defining indicators" to "can the business model concept improve communication" (favorable in green, reluctant in red).

	employees	use of concepts	use of tools	trial & error	defining indicators	improving decision making	improving strategic planning	helping in the design of ISs	increasing innovation	improving process design	improving communication
Retail over Internet	3	little	no	yes	q1		q2	q3	q4	q5	
Software in the mobile industry	5	little	no	yes		q6	q7	q8	q9		q10
Service over Internet	15	no	no	yes	q11	q12	q13		q14	q15	
Service in Finance	31	no	no	no		q16		q17			
Internet Industry Platform	80	yes	no	yes		q18		q19	q20	q21	
Industry	400	yes	no	no		q22		q23	q24	q25	q26
Entertainment	10-1200	no	no	yes			q27				
Transport	3'315	no	no	yes		q28	q29	q30	q31		
Consultant 1		yes	no	-	q32	q33, q34		q35	q36	q37	q38
Consultant 2		yes	no	-	q39	q40	q41		q42		q43
Consultant 3		yes	no	-		q44					

= positive answers = negative answers = neutral answers q = quote

Table 44: Interview outcome

7.2.1 Use of formal concepts and tools

The first part of the interview aimed at examining if the interviewees and their companies used models, formal models or even more sophisticated business tools in business planning. Of course this was not aimed at giving us such detailed insights to business concept use, as for example the study by Rigby (2001), but it can serve as an indicator for companies being comfortable with the use of concepts.

Not surprisingly, very few companies, but all the consultants used concepts or models. One consultant put it very clearly: "*I have seen very few managers use concepts or models, but then that is one of the reasons why they bring in us consultants*". The CEO of the industrial company

that actually used some formal concepts said that "*it took quite a lot of work to use these concepts, but it was very helpful. What was not satisfying was that we didn't exploit them sufficiently once the work was done*". At another point he mentioned that "*at the end of the day there stays very little time for doing prospective business planning*". Surprisingly, the smallest company interviewed used a conceptual tool for business planning. In the CEO's opinion the most important aspect of using a concept was consistency. Concepts would only bring advantages when rigorously applied.

The younger companies had all made business plans during their startup phase. This could also be seen as the use of some sort of concept, as most of them had structured their business plan according to recommendations in books available on the market. One executive compared the business model ontology to the business plan approach and saw it as a quite useful checklist, particularly for start-ups.

A surprising finding was that a large number of companies relied deeply on trial and error to introduce new aspects to their business. The planning for this relied essentially on drafting text documents with a Word processor and calculating the financials with a spreadsheet program.

7.2.2 Impression of the Business Model Ontology and its Completeness

One of the goals of the interviews was to capture the interviewees' impression of the business model ontology by presenting and explaining them different business model views (i.e. instantiations) as explained above. This was principally destined at evaluating the business model ontology's fidelity with real word phenomena (based on March and Smith 1995). In other words, the objective was to find out if in the interviewees' opinion the ontology was suitable to describe the business model of a firm. The questions on the ontology's completeness, e.g. "*In your opinion, what elements are missing in the model presented before*", served to start discussing fidelity to real world phenomena. Experience showed that the interviewees could give some important feedback on the ontology's composition, but had too little time and were not in the position to evaluate completeness. Nevertheless, they were perfectly able to express themselves on the ontology's ability to represent the business logic of a firm or even their firm.

All interviewees were quite happy with the presentation of the presented instantiations of easyJet.com's business model and the more detailed views of ColorMailer, Nokia and Barnes & Noble. Two managers and two consultants insisted on the importance of the relationships between the elements. According to them it helped to understand how the elements of a business model interact. The manager of a company active in services for financial companies stated that "*people can start to see where some of the complexity is. It helps you visualize the relationships, you know, with clients and with suppliers*". One of the consultants saw the value of the ontology in representing the relationships between the whole: "*Everything that helps to understand the vision of the whole is great. Also the relationships, the complexity, how things relate play a very important role*".

Furthermore three interviewees insisted that the ontology would become even more interesting if it were able to visualize cost relationships: "*if you work with such a tool you should be able to have the whole cost calculation if you click on infrastructure*" or "*if you have factors, how will some factors influence the final result, the whole? When you make projections it is funny how some factors have an influence on the end result*". One of the interviewed consultants acknowledged the difficulties of working with absolute numbers and suggested that "*it would be interesting to calculate the impacts, for example with relative values*".

A major concern of a manager of a startup company was that models create redundancies: "*the problem I think is redundancy. Matrixes bring redundancies. My fear is that if you click on these elements that you will find the same thing behind the elements*".

7.2.3 Business Model Use

The fourth part of the interview was devoted to investigating possible uses of the presented ontology. This does not directly contribute to evaluating the ontology but investigates its usefulness. The interviewees were asked seven questions with open answers:

1. How could such a model help you define business indicators?
2. How could such a model help you or a group of managers make better decisions?
3. How could such a model improve some parts of strategic planning?
4. How could such a model make it easier to chose and design appropriate information systems (e.g. software purchases like Customer Relationship Management or Supply Chain Management...)
5. How would it be able to foster innovation in a company with such a model?
6. How do you think such a model could improve business process design and engineering?
7. How could it be helpful to have such a model to communicate your business model. (when making decisions, to communicate with employees)

The two most important themes that can be isolated from these seven questions were transparency and communication. They appeared in several answers of the interviewees to several different questions. Transparency was particularly mentioned by two managers and two consultants. For example to the first question on business indicators one manager mentioned: "*it is important to make things transparent to show where cost and risks come from. Transparency is very important. […]. Such a framework can be interesting*" (cf. quote q1 in Table 44).

Communication was another recurring theme throughout the answers and explicitly addressed in the last question on communication. Especially in question two on decision making communication was mentioned by four interviewees in combination with transparency: "*it's also about transparency. Somebody puts up the sheet and says this is our company and this is the way it works. Not everybody understands the same thing under the functioning of a company*" (q33). One manager that was less enthusiastic about the business model concept's role in improving decision making acknowledged: "*it helps in communicating, in that sense it may improve decision making. But at least this way people talk about the same thing*" (q12). One CEO of an industrial company said that the ontology "*can be very helpful if not too complicated and adapted to specific managerial levels for decision making: employee communication; customer presentations (screened); and training purposes (employees and customers)*" (q26) and that "*it [the ontology] is a very useful instrument to initiate discussions with employees, partners or customers about process improvements. The visualization helps also in the internal or external communication of business decisions*" (q25).

Defining indicators. While quite a few interviewees seemed favorable to the idea that the use of the business model ontology could improve defining business indicators they particularly stressed financial indicators. One interviewee pointed out the importance of transparency regarding costs and risks (q1). A consultant insisted on the financial relationships: "*If I can change parameters in the model and see how this impacts costs, profits, then yes. If you can model cost structure and profitability you have to integrate it with the how and who [infrastructure and customer relationship]. I have to understand how factors influence each other and then I will look at evolutions more closely with my controllers*" (q32).

The chief operating officer (COO) of a company with 15 employees was rather critical and remarked that "*in a company like ours everything is in the heads of the people*". He saw the value of the ontology elsewhere: "*Where it can be very important is on the venture capital side or the investor side where you have to map business models quickly*" (q11). Astonishingly, few

interviewees bought in on the idea of not only defining financial indicators, but defining indicators throughout the business model pillars. One consultant that understood this asked in what the idea of deriving indicators from the ontology was different from the balance scorecard concept (q39).

Improving decision making. The reactions to the question on improved decision making through tools based on the business model ontology where mixed. Many of the interviewed saw an indirect influence on decision making through discussing the fundamentals of a business (q34, q40, q18. q28) and through improving communication. The executive from the transport industry saw the force of schematizing in asking fundamental questions: "*You will have to ask yourself in which box [element] I put what - it allows me to look at things from a new angle. It forces you to ask questions. But I see this rather as a tool for startups*" (q28). One manager of a startup company talked about his experience at a large corporation where they used a simple conceptual model to communicate during meetings. As regards the ontology he noticed that it may help people talk about the same thing and thus improve decision making (q12). Another COO was quite enthusiastic stating "*it would certainly help to make better decisions. Oh yeah, I'd love to see this in my department*" (q16). One of the interviewed consultants acknowledged the value of the ontology in communication but perceived it as too static to improve decision making (q44).

The founder of a software company in the mobile industry felt that the problems he experienced in decision making where much more related to human aspects of the deciders (q6). The CEO of an industrial company was rather favorable, but questioned the availability of business data, "*the framework can help to better set priorities, however, to better support the decision process, the availability of business data needs to be ensured*" (q22). Furthermore, he stressed the importance of having to be able to "*introduce such a business model framework within reasonable means and resources*".

Improving strategic planning. The ontology's possible direct or indirect contribution to improving strategic planning was perceived by all but two interviewees that answered the question. The CEO of the smallest company interviewed saw the business model concept as a way to outline the steps necessary to achieve a strategic goal (q2). Another manager saw the advantage in taking into account all the elements of a business model (q7). A consultant proposed combining business model and scenario approach in order to have an impact on strategic planning: "*[The business model concept] can indirectly influence direct strategic planning through scenarios and transparency*" (q41).

One executive that was reluctant stated: "*We would think what kind of skills we need. We would make a cost model and a revenue model. We would make a prototype and look if it works. If it doesn't work we would stop the test*" (q13). This approach remarkably resembles some of the structures of the business model ontology. The executive from the transport industry was also reluctant and thought that the ontology could have an impact on strategic planning if it allowed simulation (q29). Finally, the executive from the entertainment industry observed that looking at his enterprise through the business model lens opened up new perspectives that were not usual to his business (q27).

Helping in the design of ISs. The question on improving the design of information systems (IS) was not answered by all the interviewed practitioners because not all of them felt expert enough to reply. The answers that were given were quite mixed and split between three supporters and three opponents of the idea. Noteworthy, the supporters felt very strong about the necessity to describe the business logic of a company to improve IS design.

The CEO of the industrial company, the COO of the financial platform and one of the management consultants strongly backed the link between business model and IS design. The first declared "*once business models/processes are clearly defined and evaluated, respective*

appropriate information systems can be easily defined. There are significant differences in the business processes supported by off-the-shelf information systems. Therefore, a business framework can not only help, but is almost required to identify the information system with the best fit" (q23). The second proponent mentioned: "*I think you make things much easier here… much, much easier. Well I think what we've done is that [..] it presents it [the business model] in a clear way. So everybody starts in the same place. Picking up on your point about taking it out of a manager's head and putting it on a piece of paper*" (q17). The consultant answered like the CEO: "*You absolutely need a model before you can do anything*" and "*especially if the dependencies and interactions of the different building blocks become clearer. "Transparency is important for understanding what we do and how the building blocks interact*" (q35).

The CEO of the small Internet retailer felt that the business model concept would probably not improve IS design because of its static nature (q3). Similarly, the co-founder of the small software company remarked that the tools based on the ontology "*may influence IS design, but will not essentially help to improve it*" (q8). An executive from an Internet industry platform had the impression that according to his experiences "*engineers would not be favorable to use such a tool as the business model ontology*" (q19). Another manager saw the use of the ontology in IS design particularly for new economy companies of a networked type (q30).

Increasing innovation. With regard to innovation there were two positions, the first accentuated the human capability aspect of innovation (q9, q14, q42) and the second drew attention to the fact that the visualization and transparency created by the ontology could improve innovation (q4, q36, q31). A proponent of the first view stated: "*What is important is thinking it through. That is what takes time. If we look at the value proposition it is the thinking behind it that is important. If we are in front of investors the important thing is that it is innovative, that there's a prototype, that it was tested and that it comes over technically. And that thinking takes time*" (q14). Similarly, another one mentioned that "i*nnovation is more about the people*" (q9). A consultant commented that the ontology may help in innovating but that "*the tool will not generate innovation. You still need the creativity of the people*" (q42).

A proponent of the positive effect on innovativeness pointed out that thinking through a business model will automatically stimulate innovation: "*Establishing/elaborating business models and business processes requires thorough and in-depth analyses which leads by itself to innovative ideas and incentives on how to improve key indicators and elements of business models and how to better process steps or phases*", (q24). Similarly, another executive had the impression that structuring the thought process could be an advantage for brainstorming and have an effect on innovation (q20).

Improving process design. The interviewees that answered the question on improving process design were all relatively positive except for one that underlined the model's static nature as he had already done for information systems (q5). They saw the ontology's value in its high level business logic description: "*I think something like this model is the foundation. Before you can describe processes you have to have something like this at the generic high level*" (q37). The executive of a startup, however, emphasized that this is too sophisticated for small companies, "*in a small company this would be overkill*" (q15). The executive from the Internet industry platform had the impression that such a model would help people keep in mind the whole, because they would often forget other parts of the company when designing processes (q21).

Improving communication. As explained above its ability to improve communication between different parties was seen as one of the strong points of the business model concept. One consultant saw it as "*a formalism that everybody understands to speak the same language*" (q43). Another one pointed out that it helped people to talk about the same thing: "*First you have to assure that everybody is talking about the same thing. For example in customer relationships you*

can imagine talking about hundred different things. It's about presenting things in a simple way that is certainly the most important" (q38). One interviewee saw tools based on the business model ontology as a means to communicate with employees, customers and for training purposes (q26). The interviewee opposed to the positive effect on communication felt that "*it's too complicated to represent a business model in 9 elements. It's [a business model] more about how I make my money*" (q10).

Recapitulating, I think the interviews have shown a number of different things. The executives of very small companies have mixed opinions concerning the use of the business model ontology, particularly in applying it to their firm. Though not completely reluctant to the use of the ontology they feel that the business model of their company is already sufficiently clear.

It also seems that the larger the companies of the interviewees were the more favorable they tended to be regarding the use of the business model concept - with the exception of the executive from the transport industry. The consultants all seemed quite comfortable with the idea of applying the business model concept to a number of different problem domains.

The main strengths of the business model ontology that came out of the interviews were threefold:

a) Its ability to create a transparent big picture of a business and to externalize the relationships and dependencies of the business elements.

b) Its use is comparable to the use of a commonly understood language to enable communication.

c) Its use can stimulate approaching and understanding the fundamental questions of a business.

Of course the above mentioned strengths are simply impressions of the interviewed business practitioners and would have to be empirically tested, but which would go beyond the possible of this dissertation. Therefore I formulate a set of three hypotheses that could be used in further business model research. One of the problems of testing these hypotheses is that they demand specific tools (i.e. instantiations) based on the business model ontology. As mentioned by March and Smith (1995) this means that the performance of tool or instantiation and ontology can not be dissociated. Nevertheless, the following hypotheses could give interesting hints on the use of the business model concept:

h1. A business model ontology based visualization tool can help business practitioners more quickly understand a business model and the relationships behind its elements.

h2. A business model ontology based tool creates a common langue to address business model issues and in this regard improves communication between business practitioners.

h3. Discussing business model issues with a business model ontology based tool (to understand business models) has an impact on discussion quality.

7.3 BUSINESS MODEL CASE STUDIES

The business model ontology has been applied to three different case settings and is being used in a graduate thesis at the University of Bern. The first one was a case study that I have made of the Montreux Jazz Festival in October 2003 and that I captured in BM^{2}L. The second setting was a case study and analysis of a small enterprise in form of a Masters thesis carried out by a student of the Masters Program in Business Information Systems (MBI) at the Business School of the University of Lausanne (Durig-Kalashian 2003). The third setting was the application of the ontology to the students' annual project of an IS strategy course of the MBI taught by Professor

Yves Pigneur. Finally, the ontology is being applied to a number of e-business cases in a graduate thesis at the University of Bern.

7.3.1 Instantiation, BM²L and Montreux Jazz Festival

The case study of the Montreux Jazz Festival illustrated in section 5 was conducted in October 2003. It included the description of the MJF's business model and its capture through the Business Model Modeling Language BM²L (see section 6). In terms of validation this means three things. Firstly, by using the business model ontology to describe the business model of the Montreux Jazz Festival an instantiation of the ontology is created. Secondly, testing if the ontology is able to represent the business model of a real-world business by discussing the captured MJF case study with its manager signifies getting insights on the instantiation's fidelity with real word phenomena and its understandability. Thirdly, if it is possible to implement the ontology in a prototype and capture the MJF's business model it demonstrates feasibility, without, of course, expressing anything about its value for business. In their design science methodology March and Smith (1995) state that instantiations show that constructs, models or methods can be implemented in a working system. This demonstrate feasibility, enabling future concrete assessment of an artifact's suitability to its intended purpose.

The discussion of the formally captured MJF case with the Mathieu Jaton, the number two and principle manager of the Festival, exposed two qualities of the business model ontology. One was its ability to display the big picture and the other one was its ability to transparently display the different aspects of a business model. He said that "often people don't perceive the Montreux Jazz Festival as a business because they associate it to music and party rather than to hard work, management and budgets. The business model concept exposes the business aspects of the festival". Mr. Jaton saw the structured business model as a way to analyze the Festival and to communicate some aspects to certain stakeholders. He was interested in further analysis and feedback on the case study.

A very interesting application which is further investigated in section 8.1 and is currently quite important to the MJF is the alignment between its business model and future information systems. The MJF is in the phase of evaluating new possibilities to manage its JAZZ currency and eventually new access systems for concert visitors and staff members.

7.3.2 Use and test ontology by others - feedback

My chocolate. The most in-depth use of the business model ontology outside this research was its application to an artisan chocolate producer. The small enterprise based in Lausanne, Switzerland, wanted to complement its physical business with an online shop. The analysis resulted in a Masters Thesis (Durig-Kalashian 2003). Though very small in scale the study gives some very nice insights on the applicability of the concept. Its use for validation of the ontology stays somewhat limited yet it gives a good indication on usability.

The firm used the ontology to get a better understanding of the business logic of the company in order to go online. Furthermore, the application of the business model concept aimed at facilitating the alignment between IT infrastructure and the business (based on the concepts of Weill and Vitale 2002). The ontology was also used to define the required application portfolio (based on the matrix by Ward 1988) and to identify indicators to measure business performance (based on the BSC by Kaplan and Norton 1992).

According to the author of the analysis developing a formal business model for the chocolate producer helped the firm to clearly define and understand its business logic. It made clear the links between the firm's value proposition, the customer relationships through which this value proposition would best be communicated, and the capabilities and resources necessary to deliver

them. Above all, the business model seemed to serve to define the IT infrastructure enabling the implementation of the business logic. For each part of the business model, the supporting IT infrastructure services were defined, and the corresponding application portfolio developed and analyzed in terms of its life cycle management. Finally, the business model analysis included the development of a set of BSC indicators to measure the performance of the business.

Masters students' case studies. The business model concepts that underpin the business model ontology were taught during the first half of an IS strategy course of the Masters in Business Information Systems by Professor Yves Pigneur at the business school of the University of Lausanne. The second part of the course was on business-IT alignment, industry analysis, disruptive technologies and prospecting methods (e.g. scenarios). Within the scope of this course the students had to analyze a business model by using the elements of the business model ontology. Furthermore, they studied alignment, application portfolio, industry actors and prospects of the companies in question. The students could freely choose the cases they wanted to analyze (cf. see Table 45). This annual course project was document in form of a pre-formatted word document.

Company & industry sector	Company information
Logifleet – Fleet management systems provider	Swiss startup founded in 2002
Factory121 – personalized Swiss watch retailing over the Internet	Swiss startup founded in 2003
LeLivre –book retailing over the Internet	Subsidiary of book retailer Librairies La Fontaine SA
Ellipse – bricks & clicks book retailing	Swiss bookstore founded in 1984
NetMovies – DVD rental over the Internet	Subsidiary of Aleance (USA) founded in 2001
MNC – mobile phone services (SMS)	Swiss Telecom service provider founded in 1998
Adrenalink – sports marketing and management consultancy	Swiss consultancy
Phone-Plus – telecommunication services reseller	Belgian venture established in 1999
ZenithVie – life insurance	Swiss company

Table 45: Masters students' case studies

The part of interest for this dissertation was on the business model analysis of the cases studies and the use of the concepts taught in the course. Therefore I asked the students to fill out a questionnaire assessing the usefulness of the ontology and the concepts applied to their particular case study. The closed questions that the students were asked to rate between 1 and 5 (1 = very definitely not, 3 = to some extent, 5 = very definitely) are shown in Table 46. In addition some open ended question investigated the students' experience using the business model concept. A total of 9 questionnaires were filled out.

Closed interview questions rated between 1 and 5 (1 = very definitely not, 3 = to some extent, 5 = very definitely)	average
Did the concepts exposed in the course "Stratégies et technologies de l'information" allow you to accurately describe the business model of the company you analyzed?	3.89
How closely do the elements of the sample document cover the aspects of the business model analyzed?	4
Was the concept "proposition de valeur" relevant to describe the business model you analyzed?	4.44
Was the concept "clients et canaux de distributions" relevant to describe the business model you analyzed?	3.78
Was the concept "relation-client et confiance" relevant to describe the business model you analyzed?	3.78
Was the concept "activités et compétence" relevant to describe the business model you analyzed?	3.89
Was the concept "partenariat" relevant to describe the business model you analyzed?	4.11
In your opinion is the business model concept useful?	4.33

Table 46: Interview questions Masters Students

The students seemed quite happy with the concepts chosen to describe the business model elements as there was no score under 3 and the average score of the first question was close to 4 (= definitely). Also, the structure of the sample document modelled after the ontology seemed to satisfyingly cover the aspects of the students' business model case studies scoring an average of 4. From the specific concepts the value proposition was the most appreciated, while all of them seemed sufficiently relevant to describe the business model element in question. The question on the overall usefulness of the business model concept scored a very high average of 4.33.

In the open questions one student remarked that the business model concept helped him thoroughly reflect on his own company that is in the early stages of its development. Another student found it difficult to apply the business model concepts. Similarly, another student mentioned that the description of a business model demanded a large time investment from the interviewers and the interviewees. Finally, one student said the business model analysis was very welcomed and appreciated by the company they studied, because it was a way to describe their company which they didn't know before.

7.3.3 Use of the ontology in other contexts

The business model ontology was also used in a developing economy context. Some propositions were made to apply the ontology for business model knowledge transfer to developing countries (Osterwalder 2002; Osterwalder, Rossi et al. 2002; Osterwalder 2004). Furthermore, in the same context the 9 business model elements were used to describe the business model of a Bangladeshi Telecommunication Company, Grameen Phone, which aims at connecting Bangladesh's rural villages (Osterwalder 2004).

7.4 TESTING ONTOLOGIES – WHAT'S NEXT

More in depth validation of the ontology and its components with different approaches are imaginable. It could be interesting to give the same case study information to different people and ask them to use the business model ontology to capture the case' business model. Similar outcomes would give more information on the ontology's domain authority. Such an experiment, however, would not provide any input on the ontology's usefulness in a business setting. To learn more on the ontology's business value one would have to test concrete tools (i.e. artifacts) built on the basis of the ontology. This would allow the assessment of a tools' suitability to an intended purpose and would indirectly validate the ontology.

For example, a visualization tool and its ability to improve communication could be tested in a management workshop. Equally, the concepts exposed in section 8.1 on alignment could be used and assessed in a workshop setting and their impact tested. This would satisfy March and Smith's (1995) second stage of design science applying the social science couple of theorizing and justifying. Additionally, one could imagine testing two or more similar business model concepts and comparing the outcome.

Concretely, I propose that future work on business models includes testing the following hypotheses developed on the basis of the interviews with business practitioners (see section 7.2):

h1. A business model ontology based visualization tool can help business practitioners more quickly understand a business model and the relationships behind its elements.

h2. A business model ontology based tool creates a common langue to address business model issues and in this regard improves communication between business practitioners.

h3. Discussing business model issues with a business model ontology based tool (to understand business models) has an impact on discussion quality.

However, testing these hypothesis is not an easy task and constitutes an entire research in itself. While h1 seems more or less straight forward to test h2 and h3 would require observing a management team over a period of time before introducing the business model ontology. In a first ethnographic-like step one would have to try to assess communication style and discussion quality and in a second step one could apply the business model ontology and analyze the change.

Another validation method worth investigating is the comparison of the business model ontology with other models. It could be interesting to assess the same case using different approaches and define useful metrics to compare the outcome. As Gordijn's E^3value framework uses a similar ontological approach to the one applied in this research it could be appealing to compare it with the business model ontology.

Noteworthy is the fact that of all the authors that presented different business model frameworks only Gordijn (2003) has written about some kind of evaluation having applied the e3-value methodology in consultancy work. None of the authors has set up any hypothesis and tested them in a field setting.

Note:

The concept of business models and the business model ontology have been presented at several peer-reviewed conferences (Ben Lagha, Osterwalder et al. 2001; Osterwalder, Ben Lagha et al. 2002; Osterwalder and Pigneur 2002), doctoral workshops (Osterwalder 2002; Osterwalder and Pigneur 2002), published at a number of occasions (Dubosson, Osterwalder et al. 2002). The most recent version of the ontology will appear as a book chapter in a book on "Value Creation from E-Business Models" (Currie 2003). Some of the constructs have also been presented as separate papers at peer-reviewed IS conferences (Osterwalder and Pigneur 2003; Osterwalder and Pigneur 2003). One paper presented the business model ontology as a means to achieve an alignment between business strategy and information systems (Osterwalder and Pigneur 2003).

More interestingly, the business model ontology has been recognized by the business model research community (Pateli 2002; Pateli and Giaglis 2003) and has led to an international workshop on business models (Osterwalder and Pigneur 2002) and to a panel on business models at the 16th Bled Electronic Commerce Conference. This has created an interesting dynamic of exchange between researchers in the business model domain, such as with Jaap Gordijn, Harry Bouwman, Patrick Stähler, Otto Petrovic and Christian Kittl.

8 ONTOLOGY APPLICATIONS AND FUTURE RESEARCH

In this section of the dissertation I outline some ideas for applications and possible future research that draw from and build on the research described in this thesis. As business models are a very broad domain and still a young research stream this list of applications is of course non-exhaustive. It contains some research directions that I think are worth pursuing and that form an extension to the business model ontology presented in the foregoing sections.

8.1 ALIGNMENT

The first area of further research that could be promising is alignment between strategy, organization and IT. From an alignment standpoint, if the business model has been precisely defined using the business model ontology it should help to improve answering the following questions visualized in Figure 68.

Strategy. What are the indicators of the executive information system for monitoring the strategy, using for example a balanced scorecard approach (Kaplan and Norton 1992) with its financial, customer, internal business, and innovation and learning perspectives?

Organization. What is the alignment profile with its IS role (opportunistic, comprehensive or efficient), IS sourcing arrangement (in-sourcing, selective or outsourcing) and IS structure (decentralized, shared or centralized), using for example the "defender, prospector, analyser" framework adopted by (Hirschheim and Sabherwal 2001)?

Technology. What is the application portfolio with its turnaround, strategic, factory and support applications (Ward 1988)? What is the IT infrastructure (Weill and Vitale 2002) with its different components?

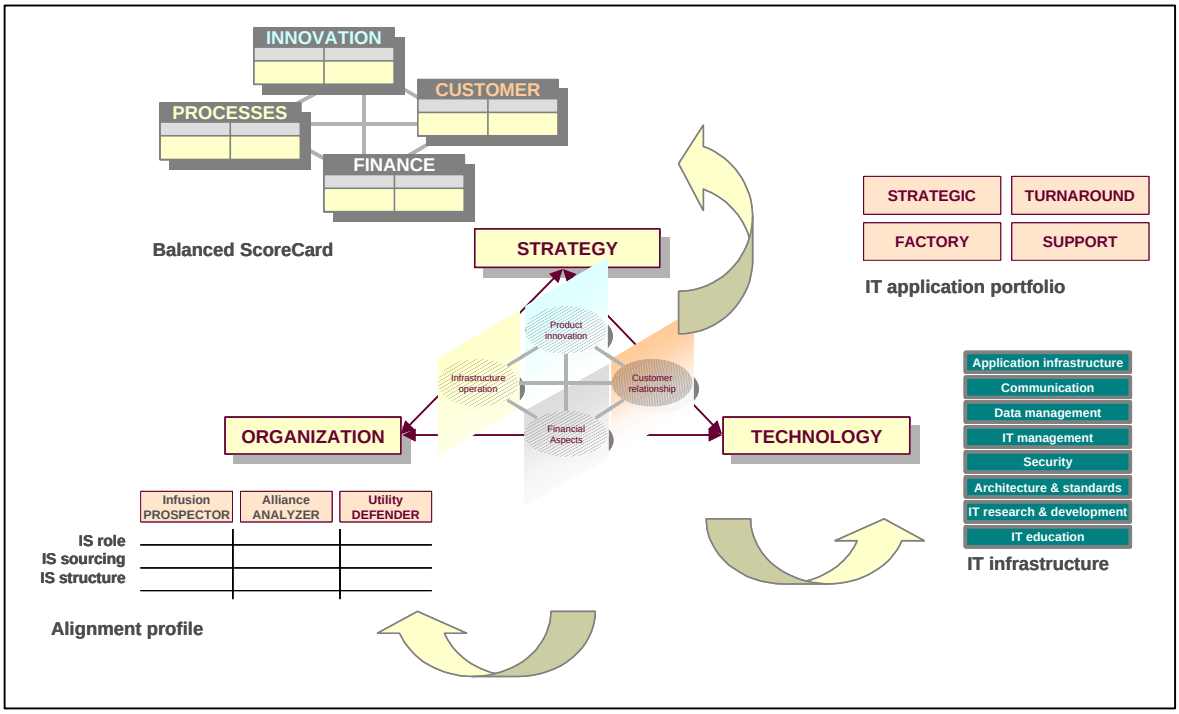


Figure 68: Alignment based on the business model

Business and Information Systems (IS) alignment has been largely investigated (Henderson and Venkatraman 1993; Luftman, Lewis et al. 1993; Maes, Rijsenbrij et al. 2000; Hirschheim and

Sabherwal 2001). Yet, it seems that all publications are rather vague in terms of how to practice alignment, apart from some rules of thumb (Luftman 1996). For the time being the most referenced method is still the relatively general framework by Venkatraman and Henderson (Henderson and Venkatraman 1993). Thus, in the following sections I try to develop one of the enablers of alignment and tackle one of the inhibitors, which are "IT understands business" respectively "IT does not understand business", both mentioned in a field study by Luftman (1993).

Concretely, I argue that the business model concept can serve as a federator between "the worlds of business and IT". In other words, business people have to be able to clearly formulate their vision and what they expect from IS people and IS staff has to be able to point out how Information and Communication Technology (ICT) can improve a company's business goals. Yet, these two worlds, the one of business and the one of technology, sometimes seem quite distant. On the one hand every manager and entrepreneur has an intuitive understanding of how his business works, but in many cases she or he is rarely able to communicate it in a clear and simple way (Linder and Cantrell 2000). On the other hand, IS people have a clear idea of what information technologies are able to accomplish in IS management, but they struggle to achieve a strategic fit with the big (business) picture (Camponovo, Osterwalder et al. 2003). Therefore, Chesbrough and Rosenbloom (2000) perceive the business model as a mediating construct between technology and economic value.

8.1.1 Information Technology Alignment

Weill and Vitale (2002, p.18) "*define a firm's information technology portfolio as its total investment in computing and communications technology. The IT portfolio thus includes hardware, software, telecommunications, electronically stored data, devices to collect and represent that data, and the people who provide IT services. The IT portfolio includes both the "insourced" IT capabilities provided by internal groups and the IT capabilities outsourced to external suppliers*". They decompose the IT portfolio into three layers, from which the first two represent the firm's IT infrastructure (see Figure 69). The first basic layer includes IT components, human IT infrastructure and shared IT services. The second layer contains shared and standard IT applications, which change less regularly such as accounting, budgeting or human resource management. The top layer consists of fast changing local applications.

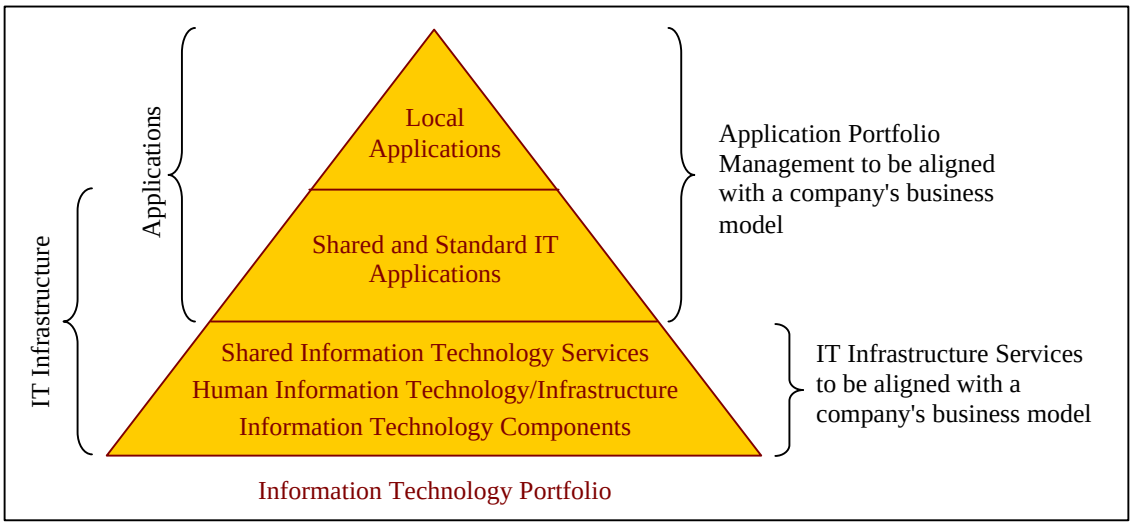


Figure 69: Information Technology Portfolio (Weill and Vitale 2002) and alignment

In terms of IT alignment with business I propose two things. Firstly, to cross the nine basic building blocks describing a company's business model with Weill and Vitale's (2002) first layer of IT infrastructure services, which they divided into nine service areas (see Table 47). Using this matrix as a basis for analysis it may be able to achieve a better alignment between the business logic of a company and the IT services provided by the IS department.

Secondly, I propose using the nine basic building blocks of a company's business model to analyze its need in terms of IT applications (the top two layers of the IT portfolio). In addition, these application's strategic importance should be assessed with Ward's application portfolio theory (Ward 1988). I believe this could allow a company to streamline its application portfolio and achieve a better fit with its business logic.

IT Infrastructure Services Alignment. As explained above, one proposition is to improve business and IT infrastructure service alignment by crossing the business model concept with the IT service areas defined by Weill and Vitale (2002). These contain nine areas, namely Application Infrastructure, Communications, Management, Data Management, IT Management, Security, Architecture and Standards, Channel Management, IT Research and Development and Training and Education in IT.

Application Infrastructure includes purchasing software, developing proprietary applications, modifying applications, providing installation and technical support, and other tasks related to ensuring that applications are meeting the needs of the organization.

Communications Management focuses on all the technologies and infrastructures that facilitate digital communication both within the organization and with the outside world.

Data Management refers to the way the organization structures and handles its information resources. Data may be sourced from internal or external databases.

IT management includes many of the professional and strategic activities of the information technology group including negotiation, IS planning, project management, and other tasks.

Security refers to the need to protect data, equipment, and processing time.

IT architecture is a set of policies and rules that govern the use of IT and plot a migration path to the way business will be done in the future.

Channel management recognizes that new and emerging technologies allow direct connections or distribution channels to customers.

IT research and development includes identifying and testing new technologies for business purposes and evaluating proposals for new information systems initiatives.

IT training and education ensures computer proficiency levels meeting corporate requirements. IS management education is the education aimed at senior levels in the firm designed to generate value from IT use.

	Application Infrastructure	Communications Management	Data Management	IT Management	Security	Architecture and Standards	Channel Management	IT Research and Development	Training and Education in IT
Value Proposition									
Target Customer									
Distribution Channels									
Relationship Management									
Value Configuration									
Capabilities									
Partnerships									
Cost Structure									
Revenue Model									

Table 47: IT Infrastructure Service Alignment

Table 47 illustrates the matrix combining business model and IT infrastructure services to analyze a company's need in IT services. Once the business model is captured and described with all its elements it could serve as a basis to study what needs in terms of IT services are required to optimize business. I hypothesize that it is faster (and easier) to start from a captured, depicted and explained business model to design and adapt IT services than to start from the discussion and meetings usually dominating alignment today. Of course this assumption would have to be tested in the field.

Application Portfolio Alignment. The second proposition I make is the alignment between business and a company's portfolio of applications (cf. the second and third layer in Figure 69). Therefore, in a first step a company has to analyze what applications underpin its business model and in a second step it has to assess their contribution to business, their performance and their strategic importance. The first step can be improved by departing from the captured and described business model. The second step can be achieved by applying portfolio management theories coming from finance to IT/IS applications, as more and more companies are starting to do (Hoffman 2003; Nairn 2003). In this proposition I apply Ward's Application Portfolio Framework (Ward 1988). Ward classifies a company's applications on two axes, their potential to contribute to future business and the company's dependency of an application (cf. Figure 70). He distinguishes between four categories of applications. Strategic applications that provide comparative advantage and are critical to future business success. Key Operational applications, which sustain the existing business operations. Support applications that improve business efficiency. High Potential applications, which are innovative applications and may create substantial revenue in the future but which are not yet proven.

	Strategic	Key Operational	Support	High Potential
Value Proposition				
Target Customer				
Distribution Channels				
Relationship Management				
Value Configuration				
Capabilities				
Partnerships				
Cost Structure				
Revenue Model				

Table 48: Business Model and Application Portfolio

Similar to the precedent proposition on IT infrastructure service alignment it makes sense to combine the captured business model elements with the application portfolio approach in a matrix (see cf. Table 48). This would show how applications are spread over the business model and indicate their importance.

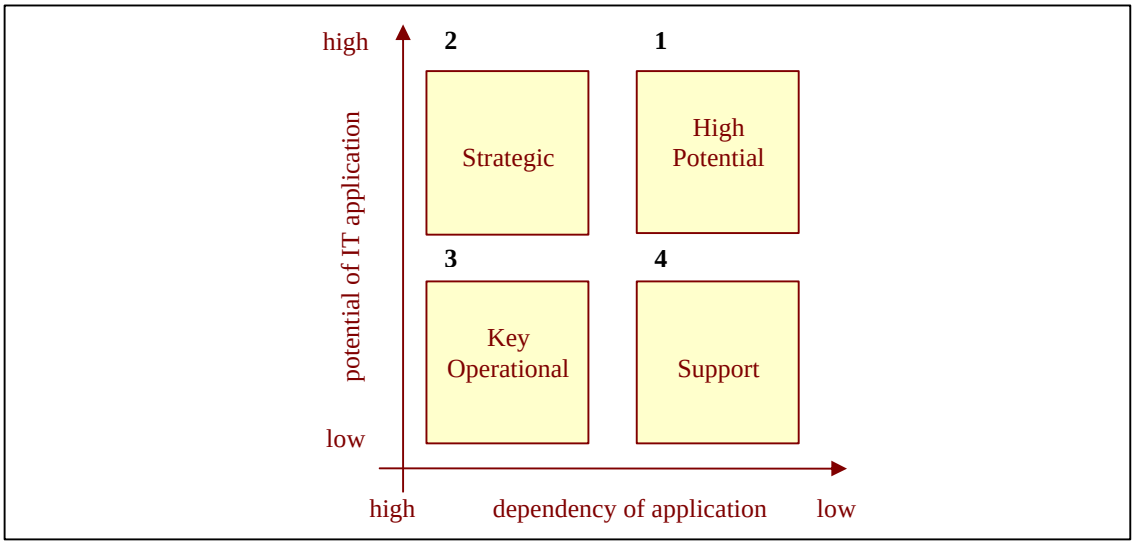


Figure 70: Application Portfolio

8.1.2 Organizational Alignment

Alignment between strategy and business organization is another field where the business model ontology might be able to contribute. This is, however, less clear than the previous proposition on alignment between strategy and technology.

One area of contribution could be the improvement of business process design due to a better understanding of the business model. One could imagine that the granularity of the business model ontology could be increased, particularly in the infrastructure pillar, in order to gradually approach the process level (see Figure 71). By increasing the granularity of description of the

VALUE CONFIGURATION, the PARTNERSHIPS and the CAPABILITIES it would become possible to close the gap that still exists between business strategy and business processes.

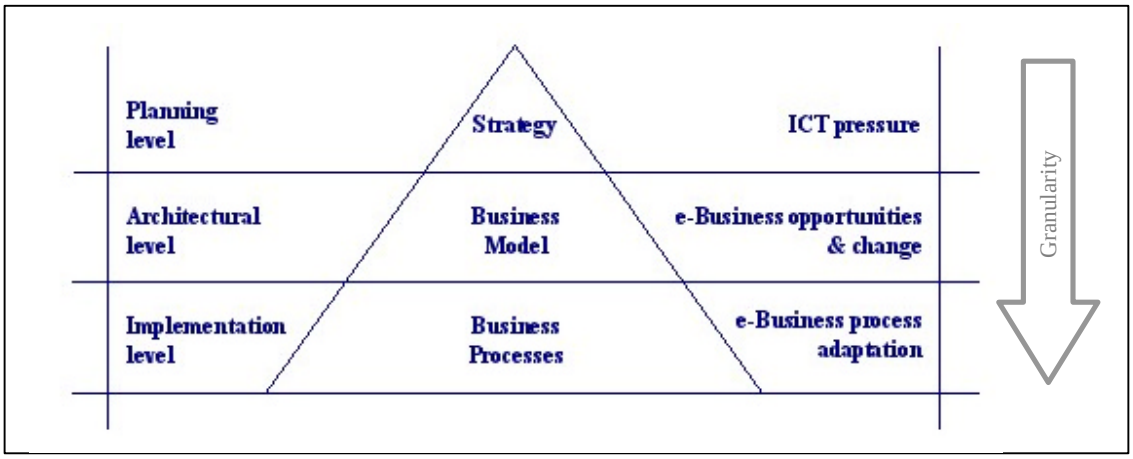


Figure 71: From Strategy to Processes

Another interesting field of organizational alignment could be looking into a company's IS structure and its relationship to business strategy. Based on Hirschheim and Sabherwal's (2001) alignment approach it might be appealing to introduce the business model ontology to concretize their alignment framework (outlined in Table 49). They differentiate between three business strategies, which are the Defenders, the Prospectors and the Analyzers. Then they cross these strategies with the IS role (opportunistic, comprehensive, defender), the IS sourcing arrangements (insourcing, selective sourcing, outsourcing) and the IS structure (decentralized, shared, centralized). Further research would aim at including the business model ontology to approach business strategy and IS role, sourcing arrangement and structure. The business model concept could be used to define the business strategy of either prospector, analyzer or defender.

Alignment Profile	Infusion: Alignment through Business Leadership	Alliance: Alignment through Partnering	Utility: Alignment through Low Cost Delivery
Business Strategy	Prospector	Analyzer	Defender
IS Strategy			
IS Role	Opportunistic	Comprehensive	Efficient
IS Sourcing	Insourcing	Selective Sourcing	Outsourcing
IS Structure	Decentralized	Shared	Centralized

Table 49: The Three Strategic Alignment Profiles (Hirschheim and Sabherwal 2001)

8.1.3 Strategy Alignment

Having captured, understood and described a business model should make it easier to define the indicators to follow in the executive information system in order to monitor the business strategy. Table 50 shows that indicators could be chosen in every business model element, followed in an IS displaying the current state, showing how it performs compared to a target value and raising an alarm when falling under a predefined critical value. As in the balance scorecard approach (Kaplan and Norton 1992) this method starts from a set of defined areas. The advantage is that having captured the business logic of the firm it should become easier to identify specific indicators than starting from a blank sheet of paper.

	Indicator	current	target	alarm
Value Proposition				
Target Customer				
Distribution Channels				
Relationship Management				
Value Configuration				
Capabilities				
Partnerships				
Cost Structure				
Revenue Model				

Table 50: Strategy Alignment

8.1.4 Montreux Jazz Festival

In this section I apply some of the ideas presented above to the Montreux Jazz Festival (MJF). The example shall illustrate the presented concepts of alignment and stimulate reflection rather than serve as a fully elaborated case. The information used come from a number of interviews and personal work experience at the Montreux Jazz Festival.

8.1.5 MJF Information Technology Alignment

IT infrastructure service alignment. Firstly, I look into IT infrastructure service alignment by outlining all the business model elements of the MJF (cf. section 5) and reflecting on the IT services that should exist to support them (see Table 51 and Table 52). This gives us a basic idea of what IT services should exist to underpin the MJF's specific business model.

For example, the MJF has six value propositions of which some considerably use IT service infrastructures and others little or not at all. The first value proposition, the MJF's main concerts, essentially use two IT service areas which are *communications management* and distribution *channel management* (cf. 1st line in Table 51). The former is required because the concert staff and production staff (e.g. cameramen) communicate intensely in order to guarantee a sound event. However, this is a basic IT service that is not key to the value proposition. The latter in contrast is a key service because the majority of tickets are sold through electronic channels.

A business model element that relies heavily on IT infrastructure services and that I describe in detail is the management of the so-called Festival-own JAZZ currency and the payments with CASH-cards (cf. 12th line in Table 52). In fact, in the 2003 edition using an own currency required 6 from the nine IT infrastructure services and in the future it may well require them all. As explained earlier in the MJF business model (cf. section 5.1.4) the Festival operates its own currency primarily to monitor revenue streams and transaction cuts (i.e. commissions) from the food and commerce stands but also for security reasons. All purchases made at the MJF are made either with JAZZ or electronically with so-called CASH-cards. CASH is an electronic means of payment for small amounts created by Swiss banks and Post Finance and operated by Telekurs-Multipay. It is found in the form of a chip on the Maestro card (a debit card), the Postcard CASH card and on neutral CASH card (as sold at the MJF). It can be loaded with money at any ATM or postal banking machine in Switzerland. Normally it functions as illustrated in Figure 72. A shop has a CASH enabled card terminal that is connected to Telekurs-Multipay over the telephone line. Telekurs does the clearing of any CASH purchase and the amount is credited to the shop's bank

account.

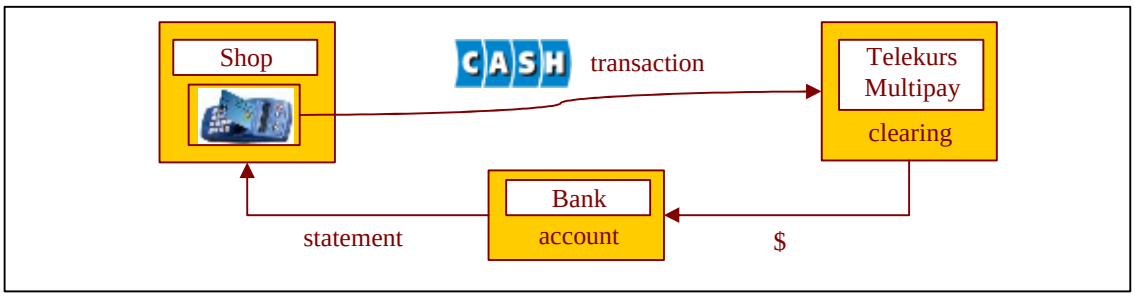


Figure 72: CASH transactions

Because the MJF takes a transaction cut of the independent merchant's revenue the functioning of the CASH system at the Festival is quite different. The terminals in the shops and in the bars are not directly connected to a telephone line but are physically synchronized with a docking station every end of the day at the MJF operations office. The transactions stored on the terminals are seized by the docking station and are communicated over an ISDN-line to a sort of bookkeeping-application and hosted by Ergonomics, the company that operates the CASH system at the MJF. Ergonomics forwards the transactions to Telekurs for clearing and also feeds them to a web application used by the MJF operations. Telekurs directly credits the transactions to a number of MJF bank accounts (cf. Figure 73).

At the same time the merchants bring the JAZZ they have earned during a Festival day to the MJF operations office where they are accounted for and booked to the Ergonomics bookkeeping application. Now the MJF exactly knows how much an independent merchant has earned and can pay him the amount owed, which is the turnover minus the transaction cut. The views on the turnovers generated from the bookkeeping application for management purposes are generated in a stand-alone MS Excel application, which is not integrated.

Hence, in terms of IT services this requires an *Application Infrastructure*, *Communications Management*, *Data Management* and *Security* for bookkeeping and monitoring JAZZ and CASH turnovers as well as for generating management views on transaction data. Furthermore, it requires services in *IT Management* and *Architecture and Standards* because Ergonomics, a partner, is managing the CASH-system and the bookkeeping application.

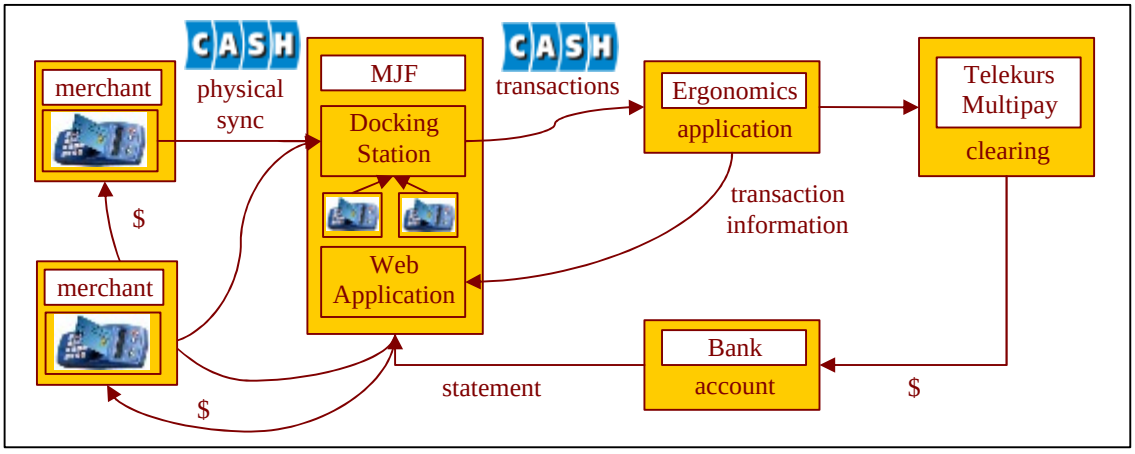


Figure 73: CASH transactions at the Montreux Jazz Festival

Interestingly, from a strategic and alignment point of view this whole system is subject to change.

In 2000 the MJF signed a contract with Ergonomics to conceive a paycenter for managing the JAZZ currency and CASH payments. Ergonomics entered the contract because it needed a testbed for a much larger contract with the Swiss Exposition in 2002, Expo.02. So the collaboration functioned very well until 2002. Now, however, Ergonomics has little interest in updating and adapting the MJF paycenter to current needs because the Festival is too small of a client. Therefore the MJF is looking for other solutions to its problems. One rather unsatisfying possibility would be to return to a merely coin-based JAZZ currency as used before 2000. Another possibility is being explored with one of the main sponsors, NAGRA of the Kudelski Group. This possibility could be followed because Mr. Kudelski is on the board of the MJF foundation.

Since NAGRA is a provider of smart card solutions and physical access and ticketing solutions a collaboration with the MJF would open up a wide range of imaginable systems. One solution would consist in replacing the JAZZ and CASH either by conventional smartcards and terminals or by contactless smartcards and transponders. This would allow the MJF to expand the use of the smartcards to other uses than payment. The cards could be used as tickets for concert visitors, as access identifiers to restricted areas for staff and for a variety of user. In addition, as NAGRA owns Ticket Corner, the whole system from the ticket purchase to the MJF visit could be integrated.

In terms of IT service alignment this allows exploring which other elements of the business model such a system would affect and in which element it would open up new opportunities (see Table 51 and Table 52). In an in-depth alignment study the different cells of the matrix would of course be described in detail.

Value Proposition v = basic service vv = key service ? = potential basic service ?? = potential key service grey = subject to change	Application Infrastructure	Communications Management	Data Management	IT Management	Security	Architecture and Standards	Channel Management	IT Research and Development	Training and Education in IT
MJF concerts		v					vv ??		
MJF off									
MJF frequentation	vv	v	vv	vv	vv	vv	??	??	??
MJF sponsorship		v							
MJF recordings	v	v				v ??	??	??	
MJF brand & franchise		v	?	??					??
Target Customers									
Festival visitors		v	v ??		v ??		vv		??
Shops		v	v		vv				
Sponsors		v							
Record, TV, artists		v	v				v		
Franchisees		v							
Distribution Channels									
www.montreuxjazz.com	vv	v	vv	vv	vv	vv	vv	??	
MJF event			v	v ??	v ?	??	?	??	
Ticket Corner		vv	vv		vv	vv	??	??	
www.ticketcorner.ch		vv	vv	v	vv	vv	vv	??	
MJF program		v	v				v		
Media		v	v				v		
www.montreuxsounds.com	??	v	v ??	??	?	v ??	vv	??	
MJF sponsors		v	v				v		
Swiss Tourism TEoS									
Relationships									
Sponsorship & VIP	??		v ??	??	??	??	??	??	
Festival visitor	??		v ??	??	v ??	??	v ??	??	
All (retention/branding)							vv		
Capabilities									
Attractive MJF venue									
Attract & feature stars		v	v						
Atmosphere & experience									
Attract people			v		v		vv		
Mobilize volunteer staff		v	v		v		v		

Table 51: IT infrastructure service alignment at the Montreux Jazz Festival (part 1)

Activities v = basic service vv = key service ? = potential basic service ?? = potential key service grey = subject to change	Application Infrastructure	Communications Management	Data Management	IT Management	Security	Architecture and Standards	Channel Management	IT Research and Development	Training and Education in IT
Contracting musicians		v	v						
Contracting sponsors		v	v						
Ticketing	vv ??	vv ??	vv ??	vv ??	vv	vv ??	vv ??	??	
Promotion		v	v				v		
Concerts	??	??				??	v ??		
F&B	v ??	??	v			??			
Commerce	v ??	??	v			??			
Merchandising	??	??	v			??	vv		
Selling recordings	??	v	v ??	??	??	v ??	v ??	??	
manage MJF infrastructure	v	v ??	v ??	??	v			??	?
Production	v		v	v		v			
JAZZ currency & CASH	vv ??	vv ??	vv ??	vv ??	vv	vv ??	??	??	??
Volunteer coordination	v	v	v ??		v		??	?	
Partnerships									
Artists							?		
Sponsoring	?	v							
Shops, F&B	vv ??	?	vv ??	??	vv	??	??	??	
Volunteers	??	?	vv ??	??	??	??	??	??	
Media		v				?	vv		
Infrastructure		v	v				v		
General Festival partners		v					v		
Friends of the Festival									
Musical partners		v	v				v		
Montreux municipality		v	v						
Ergonomics	vv	vv	vv	vv	vv	vv	vv	??	??
Revenue Streams									
Ticket sales	vv ??	vv	vv ??	vv ??	vv	vv ??	vv ??	??	
Sponsor revenues									
F&B	vv ??	??	vv ??	??	vv	vv ??	??	??	?
Merchandising	vv ??		vv ??	??	vv	vv ??	vv	??	?
Licensing of recordings	??	v	v ??	??	??	v ??	v ??	??	
Franchising		v	?	??			??	??	?
Cost Structure									
Cost									

Table 52: IT infrastructure service alignment at the Montreux Jazz Festival (part 2)

Application Portfolio. Besides aligning the first level of Weill and Vitale's IT portfolio (cf. Figure 69), the IT infrastructure services, it is also interesting to align the second and third level, a company's stable and volatile applications. Consequently, I applied the application portfolio concepts described in section 8.1.1 to the MJF. Table 53 shows an excerpt of the MJF's application portfolio illustrating those applications underpinning its activities in the Festival's value configuration. They have been classified among *strategic*, *key operational*, *support* and *high potential* applications (Ward 1988). Their return on investment (ROI), however, has not been assessed, as some application portfolio theories propose (Nairn 2003).

Activities	Strategic	Key Operational	Support	High Potential
Contracting musicians			Database, Office	
Contracting sponsors				
Ticketing	Website (NAGRA system)	Reservation System	Accounting	
Promotion	Website		Mailing Database, Office	CMS
Concerts	(NAGRA System)	Production		
F&B	(NAGRA System)	Paycenter	Accounting, Office	
Commerce	(NAGRA System)	Paycenter	Accounting, Office	
Merchandising	(NAGRA System)	Paycenter	Accounting, Office	Website
Selling recordings		Concert Database	Accounting, Office	Website (Music downloading)
manage MJF infrastructure				
Production		Production		
JAZZ currency & CASH		Paycenter & Views	Accounting, Office	
Volunteer management	(NAGRA system)	Volunteer Database	Volunteer Database, Office	

Table 53: Montreux Jazz Festival Application Portfolio for Activities

The excerpt of the MJF's application portfolio shows that the Festival's Website is currently its only strategic application, being characterized by a high degree of dependency and a large potential to achieve future business goals. As illustrated in the case study the MJF sells close to 50 percent of its tickets over its Website, impressive, but still leaving place for improvement and for progress in promotional activities.

A possible strategic application that is still in the brainstorming phase is a new smartcard payment and access application by NAGRA replacing its JAZZ currency and CASH payments managed in its Paycenter conceived by Ergonomics. The Paycenter is a *key operational* application characterized by a high degree of dependency, but little potential for future business. Contrary to NAGRA's solution which could be extended from a payment system to a fully-fledged access system, the paycenter is limited to pay management (JAZZ & CASH).

Another particularity of the MJF's application portfolio is that the accounting programme is merely a support application that is neither integrated with the Paycenter, the Volunteer Database, nor contract management with Merchants or Volunteers. This may be explainable by the Festival's event character (the main MJF lasts three weeks), but causes endless hassles, mistakes and corrections. It would make sense to introduce a light Enterprise Resource Planning (ERP) software, integrating the business model elements, such as payment, staff and contract management, thus shifting to a *key operational application.*

8.1.6 MJF Organizational Alignment

In this section I very briefly illustrate a part of the MJF's organizational IT/IS alignment based on the concepts of Hirschheim and Sabherwal (2001) explained in section 8.1.1.

Currently, based on the understanding of the MJF's business model, in terms of business strategy the Festival is mainly a *defender*. After many years of growth it has now reached its capacity limits concerning the main event, the annual Festival in Montreux, on which the majority of its value proposition s are based. The MJF now lasts three weeks, compared to a few days initially, attracts 240'000 visitors, which the venue can just manage to absorb and sells close to 100 percent of concert seats. Thus, it has shifted from "acquiring" new visitors in the last years to "retaining" its existing visitors, as the customer relationship shows. Accordingly in terms of IT/IS alignment it should have a *utility profile* focusing on low-cost delivery. This would mean that the IS role should be efficient, the IS sourcing based on outsourcing and the IS structure should be centralized. Yet, as the previous section on IT alignment has shown, the MJF's IT and IS are not based on efficiency but seem rather opportunistic. Similarly, the IS structure is not as centralized as a *utility profile* would ask, but is spread over the different activities, such as volunteer management and paycenter (cf. grey fields in Table 54).

So if the MJF plans to maintain its current *defender* business model it should adopt a clear utility profile. This would mean shifting the *IS role* to *efficient* and *centralize* its *IS structure*. But as a business model analysis has shown, the MJF might shift towards a different business strategy and modify its current business model. One element of possible change would be the intensification of its franchising activities. Until now, this has only modestly contributed to the MJF's turnover, but this could rapidly change. For the existing business model this would probably not mean a substantial change, except for a new emphasis of the franchise value proposition. A business model change with much larger consequences would be the introduction of selling downloads form its huge collection of recordings or selling live concert streaming over the Internet to individual customers. This would mean the introduction of a completely new value proposition targeting new segments of customers with a strong impact on the value configuration and partnering. As the MJF does obviously not possess the capabilities to offer music downloading partnerships with companies offering such services would be imaginable.

Such a business model would be based on an *analyzer* business strategy as it combines *defender* (annual Festival) and *prospector* (online music sales). As regards alignment this would mean shifting from a *utility profile* to an *alliance profile* based on partnering (see Table 54). Clearly, this would mean that IT/IS would take a more active role. The IS's orientation would be toward *comprehensiveness*, using a *selective sourcing* strategy, permitting flexibility and third-party assistance to help build alliances, while the structure would be *shared*.

Alignment Profile	**Infusion: Alignment through Business Leadership**	**Alliance: Alignment through Partnering**	**Utility: Alignment through Low Cost Delivery**
Business Strategy	Prospector	Analyzer ⇦	Defender
IS Strategy			
IS Role	Opportunistic	Comprehensive ⇦	Efficient
IS Sourcing	Insourcing	Selective Sourcing ⇦	Outsourcing
IS Structure	Decentralized	Shared ⇦	Centralized

Table 54: MJF Strategic Alignment Profile (based on Hirschheim and Sabherwal 2001)

8.1.7 MJF Strategy Alignment

Table 55 illustrates how an excerpt of a Business Model Scorecard for the Montreux Jazz Festival could look like. An executive Information System would allow the monitoring of indicators for the different business model elements.

	BM element	Indicator	current	target	alarm
Value Proposition	MJF concerts	percentage of seat capacity sold			
Target Customer	Franchisees	quality of franchised festival			
Distribution Channels	Media	media coverage (e.g. Nr. of TV broadcasts)			
Relationship Management	Sponsor satisfaction	sponsor questionnaire			
Value Configuration	F&B	hours out of beer			
Capabilities	Attract and feature stars	nr. of top 20 Jazz musicians			
Partnerships	F&B	nr. of different exotic food stand			
Cost Structure	Artists	cost of contracts			
Revenue Model	Merchandising	percentage of total revenues			

Table 55: MJF Business Model Scorecard

8.2 BUSINESS MODEL COMPARISON

Another interesting research direction could be a general characterization and classification of business models in order to compare them. Porter (2001) essentially classified businesses among cost leaders and differentiators, Timmers (1998) classifies business models among degree of innovation and degree of integration and Tapscott, Ticoll et al. (2000) classify b-webs among economic control and value integration. I believe that nowadays where business models are increasingly complex and different variables influence its success it could be interesting to apply a more fine-grained characterization or classification. Therefore, I propose assessing business models on nine axes which are the nine basic building blocks of a business model. Every one of these axis would allow characterizing a specific part of a company's business model (see Figure 74).

Value Proposition/Product/Value Leadership. To characterize the value proposition of a company one could imagine a scale showing how strong it performs concerning the price/value ratio of its value proposition(s).

Target Customer/Market Share. A second scale could show the company's market share to show its actual dominance in a specific market.

Distribution Channel/Channel Complexity. Channels could be characterized by there complexity having companies with a single distribution channel at the low end of the scale, companies with several stand-alone channels in the middle and companies with a range of complex and

interrelated channels at the high end.

Relationships/Customer Integration. The relationship scale could show how integrated a company's customers are. In other words, how deeply they are involved in the value creation process and how far the value proposition is tailored to their specific needs.

Value Configuration/Degree of Business Model Integration. The value configuration could be characterized by the degree of integration of the business model. The computer manufacturer Dell, for example, has a very integrated business model where everything from the supply chain to customer service is highly integrated.

Capabilities/Spread. The capabilities of a company could be characterized by the range or spread of the different capabilities necessary to execute the business model. A business model that builds on few and similar capabilities would be found at the low end of the scale, whereas a business models that demand many and diverse capabilities would be found at the other end.

Partnerships/Networkedness. This element could be characterized by the degree of networkedness of a company. In other words with how many partners the company works to execute its business model.

Cost Structure/Low-Cost Leadership. Characterizing the cost structure is rather straight forward. At the top end of the scale we have the low cost leaders.

Revenue Model/Revenue Diversity. The revenue model could be characterized by the diversity of its revenue streams. A company with a single revenue stream would be found at the low end of the scale and a company with diverse revenue streams at the other end.

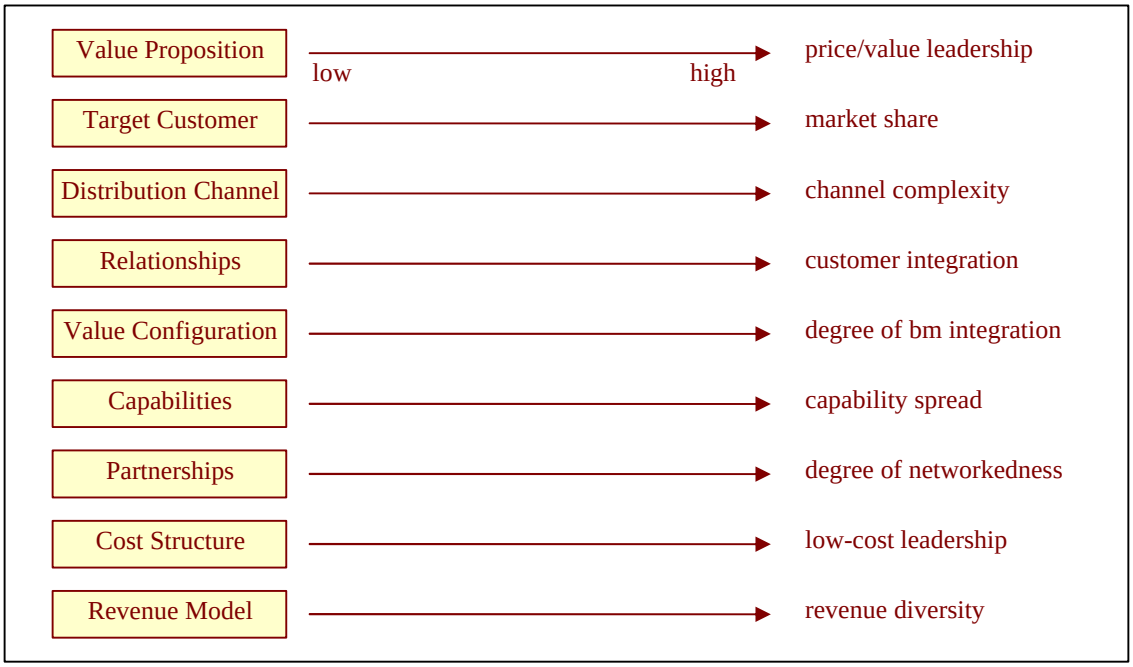


Figure 74: Characterizing Business Models

Figure 75 illustrates how a business model assessment would look like and shows a comparison of two business models in the airline industry, the one of the no-frills carrier easyJet compared to a conventional flag carrier. One could even imagine to go one step further and assess a larger number of business models in or across industries and try to analyze if there are any specific patterns in the characteristics of successful business models.

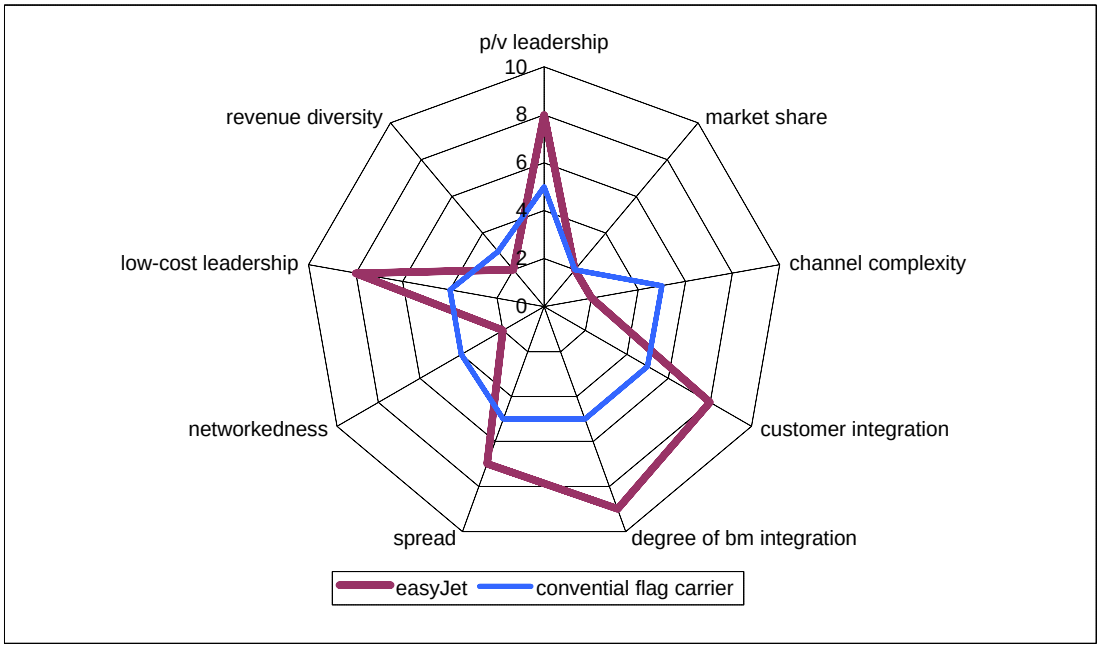


Figure 75: Business Model Comparison in the Airline Industry

9 CONCLUSION

The interviews with business practitioners have shown that the business model concept and related computer-based tools have potential to be further explored. Above all, the ability to create a transparent big picture of a business and to externalize the relationships and dependencies of business elements seem to interest executives and consultants. Furthermore, business models were perceived as a tool to create a commonly understood language to improve communication and understanding of the fundamental questions of a business.

In this dissertation I argue that a more rigid conceptual approach to business models is necessary in order to seize the possibilities detected with business practitioners. Particularly, if one envisages to build computer-based business model tools a rigorous model describing the concepts of a business model is indispensable. Based on this need the main contribution of this thesis is the business model ontology. Building on existing knowledge of the domain the ontology describes the terms, elements, attributes and relationships of the business model concept. In regard to comparable concepts the business model ontology represents a synthesis of the overall literature and a step forward in the rigor of conceptualization.

Regarding evaluation the ontology has been applied to a case study and its fidelity with real world phenomena (interviews) based on March and Smith's (1995) design science methodology has been investigated. Further research on evaluation and validation of the business model ontology was described by proposing different approaches. Also, further research on istantiations based on theorizing and justifying would tackle issues related to business model ontology-based tools and their performance.

As explained throughout the dissertation the rigorous ontological approach makes it possible to implement the business model concept into a computer-based tool. This has been demonstrated by realizing the Business Model Modelling Language BM^2L, an XML-based description language. This prototype has allowed capturing and describing the case study of the Montreux Jazz Festival, which would have been cumbersome without. Further potential lies in the extension into an analytical tool, for example, for designing, simulating and comparing business models.

In the section on future research I have outlined a number of possible paths for further exploring the potential of the business model ontology in alignment of business and IT/IS strategy. Moreover, it could be interesting to capture a large number of business models with the ontology to analyze if there are any patterns characterizing successful business models.

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