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.

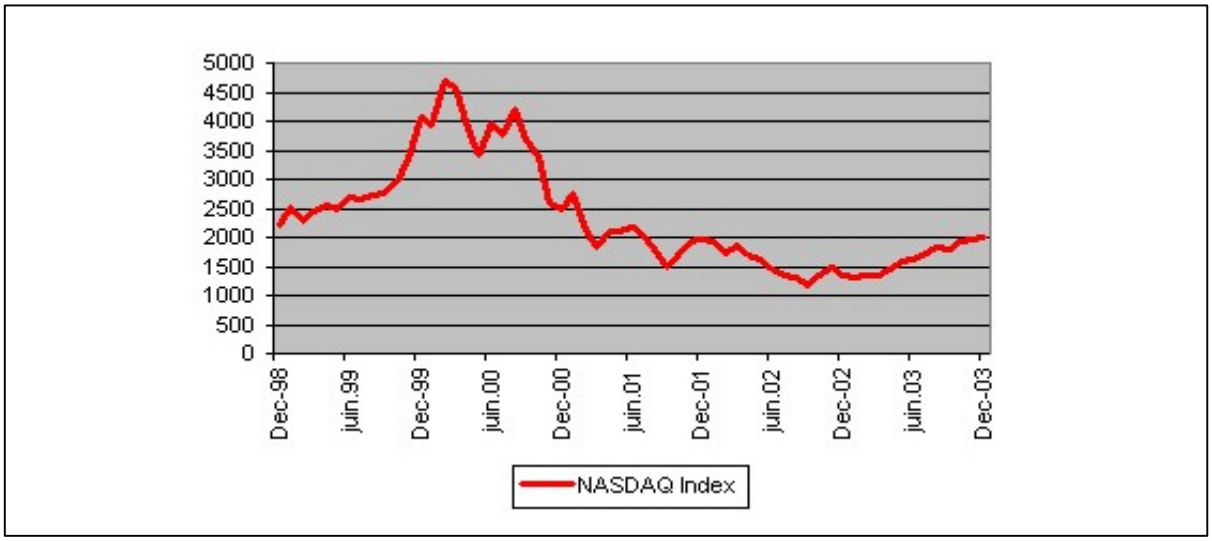

Figure 1: NASDAQ Chart 1998-2003

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.

Of course my warmest thanks go to my mother, my father my sister, my grandmothers, Jean-Luc, Luca and Hanna for always believing in me even in difficult moments and for giving me days of rest in Winterthur, St.Gallen, Davos, Montreal and Sarajevo.

I am deeply indebted to my dissertation supervisor Prof Yves Pigneur without whom I would not have been able to write nor finish this dissertation. He has always, and I mean this literally, been available to look at my work when I was stuck and helped me to restructure my thoughts. For the time being it is a myth to me how somebody can grasp intellectual problems so quickly and give back a constructive input immediately.

I express my gratitude to my dissertation jury composed of Profs Erkko Autio, Stefan Klein and Christopher L. Tucci for the discussions and inputs.

Furthermore, I'm indebted to the "business model research community" for discussions, inputs, workshops and conferences, particularly to Profs Jaap Gordijn, Harry Bouwman, Otto Petrovic and Christian Kittl, Patrick Stähler and Adamantia Pateli.

I also want to thank all my friends and colleagues at the institute for the moments we have spent together: Ivan for the Saturdays spent working, Mathias for the discussions on French thinker Bourdieu (and the pleasure and "burden" of having kids) and both for some memorable after-hour parties, my office colleagues, Sarra, Giovanni and Sandrine for listening to my "existential" problems, then there are all those that made the moments at the cafeteria more pleasant, notably Olivier, Yelena, Dominique, Bertrand, Antoine, Jan and Ian. I'm also grateful for the encouragements by Ethel Bonvin, Prof Christine Parent, the great discussions with Profs Thibault Estier and Benoît Garbinato, the enthusiasm of Prof André-René Probst, the other Profs with whom I had a warm relationship, not forgetting the team of the Infocentre helping me out during those regular computer crashes.

Of course I am also thankful for those outside of the academic microcosm that have stimulated intellectual thought and given me power to go on: Notably all the members of the Open World Initiative OWI for those amazing debates on global governance, development and trade, particularly Prof Jean-Pierre Lehmann and the OWI members at the University of Lausanne and EPFL, namely Valérie (and all those "net sends"), Gerry, Minyue, Roch, Marc and Jacques. I certainly do not want to forget my friends in Lausanne and all over the world that made me cheer up when I had weaker moments: Thank you Bijou (for all the time we spent together), Maurice, Peter, Catherine, Aïcha, Ricci, Carla, Eva, Sandra (long live FUCP), Stéphane, Thierry & Nathalie, Alain & Corinne, Yves, Philippe, Urs, Andrew, Ricci, Anouk, Angèle Flora, Florian, Christian, Olivier, Nicolas, Ben, Greg, Cyprien, Edouard, Gladys, Aleks, Véronique and Vanessa. Also, a special thanks to Stefan who's exploits in professional sports (hope to see you there in Athens!) have been a particular motivation to me.

Finally and most importantly, thank you Marliatu and Latif for stepping into my life.