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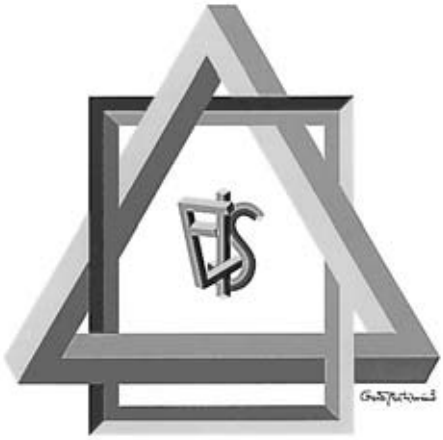
A Framework for the Strategic Management of Information Technology

By

Raquel Flodström



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Dedicated to my son Alberto

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ABSTRACT

Strategy and IT research has been extensively discussed during the past 40 years. Two scientific disciplines Management Science (MS) and Management Information Science (MIS) investigate the importance of IT as a competitive factor. However, although much research is available in both disciplines, it is still difficult to explain how to manage IT to enable competitive advantages. One reason is that MS research focuses on strategies and competitive environments but avoids the analysis of IT. Another reason is that MIS research focuses on IT as a competitive factor but avoids the analysis of the competitive environment. Consequently, there is a gap of knowledge in the understanding of the *strategic management of information technology* (SMIT).

The strategic analysis of IT as a competitive factor is important for achieving the competitive advantages of IT. This thesis explores factors related to strategy and IT that should be considered for the strategic analysis of IT as a competitive factor, and proposes a framework for SMIT. The research is conducted by means of a qualitative analysis of theoretical data from the disciplines of MS and MIS. Data is explored to find factors related to SMIT.

The results of the analysis show that the strategic management of information technology is a continuous process of evaluation, change, and alignment between factors such as competitive environment, competitive strategies (business and IT strategies), competitive outcome, and competitive

factors (IT). Therefore, the understanding of the relationships between these factors is essential in order to achieve the competitive advantages of using IT.

This thesis contributes to *strategic management* research by clarifying the relationships between strategic management, competitive environment, and IT as competitive factor into a holistic framework for strategic analysis. The framework proposed is valuable not only for business managers and for IT managers, but also for academics. The framework is designed to understand the relationship between competitive elements during the process of strategic analysis prior to the formulation of competitive strategies. Moreover, it can also be used as a communication tool between managers, in order to achieve alignment among company strategies. To academics, this thesis presents the state-of-the-art related to *strategic management* research; it can also be a valuable reference for strategic managers, as well as researchers interested in the *strategic management of IT*.

Keywords: strategic management, information technology (IT), competitive environment, and competitive advantages.

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PREFACE

The field of Economic Information Systems (EIS) includes the communication and transmission of information to, from and between people, as well as the development and evaluation of appropriate information systems for those purposes. The field also covers information structures; in other words, the interaction among modern information technology, organizational solutions and people.

Doctoral candidates in this field are associated with various research programmes. Some candidates conduct their research at IMIE (International Graduate School of Management and Industrial Engineering). Doctoral candidates at EIS may also participate in "Management and IT" (MIT), a co-operative research programmes involving ten universities. Other doctoral candidates are enrolled in the Industry Research School in Applied IT and Software Engineering, which is partially funded by the Swedish Foundation for Knowledge and Competence Development. There is also a three-year licentiate Research Programme for Auditors and Consultants (RAC). RAC is being carried out in partnership with leading audit firms in Sweden. EIS also co-operates closely with Gotland University College and Skövde University College. EIS graduate study programmes are open to some of their doctoral students.

EIS research is currently conducted under a number of principal headings:

- e-Business
- Combating Economic Crime
- Financial Accounting and Auditing
- Organization and Communication with New Information Technology

- Strategy and Management Control
- Simulation, Decision Support, and Control of Manufacturing Flows
- Applications of Principal-Agent Theory
- IT and productivity

Raquel Flodström, Master of Science in Engineering wrote Framework for the Strategic Management of Information Technology, as her Licentiate thesis

in the field of Economic Information Systems, Department of Computer and Information Science, Institute of Technology, Linköping University. She was enrolled in the Swedish research school MIT.

Linköping, October 2006

Birger Rapp
Professor
Economic Information Systems

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To my friends (who I also consider as family), thanks to Jan-Olov Hansson, Anna-Lisa Ericsson, Margit Stålh, Eva Sandborg, Peter Lind, Göran Flodström, and Karl Erik Flodström for all support, love, and encouragement during this challenge.

To my family, I thank specially my son Alberto Flodström for being my inspiration, joy, and motivation. And I thank my family in Venezuela Gladys, Maria, Jesus, Nohemar, Esther, and Mia for giving me the foundations of who I am. Additionally I thank those who have passed away but still live in my heart, Margarita de Carrillo, and Elsy Flodström, thank you for sharing your life and love with me.

I would also like to extend my gratitude to all those people that during this journey have shared their life experiences with me. Thanks for the light, love, and wisdom that you brought to my life; because they form part of the person I chose to be. Thanks to you all.

Gävle, Sweden, October 2006

Raquel Flodström
Economic Information Systems

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ABBREVIATIONS

In the discussions presented in this thesis, key abbreviations are used to facilitate the reading. Table 1 summarizes these abbreviations in alphabetical order.

Table 1: Abbreviations

Type	Abbreviation	Specification
Key abbreviation	IT	Information Technology
	MIS	Management of Information Systems (scientific discipline)
	MS	Management Science (scientific discipline)
	SMIT	Strategic Management of Information Technology
Text abbreviation	cf.	"confer" (latin) meaning compare (one source with another)
	et al.	"et alii" (latin) meaning "and other authors"
	ibid.	"ibidem" (latin) meaning "the same as the previous reference"
	i.e.	"id est" (latin) meaning "that is"
	p., pp.	Page(s)

Part I :

FOUNDATIONS FOR THE RESEARCH

This thesis starts with *"Part I: Foundations for the Research"*. Part I introduces the assumptions behind the research conducted in this thesis. This part investigates the research of the *Strategic Management of Information Technology* (SMIT) and proposes research issues to expand this domain of knowledge. Part I contains five chapters (Chapters 1–5). Each chapter introduces the foundations considered in this thesis. *"Chapter 1: Introduction to the Research,"* presents the research problem giving its background, aim, methodology, key definitions, delimitations, and outline of the thesis. "*Chapter 2: Concepts Related to the Strategic Management of Information Technology (SMIT),"* introduces the meaning of the strategic management of information technology. *"Chapter 3: Scientific Disciplines Related to SMIT Research,"* introduces disciplines that pursue research related to SMIT. *"Chapter 4: MS, MIS and SMIT Research*", introduces the contributions and gaps of MS and MIS research to SMIT. Last, *"Chapter 5: Research Methodology,"* introduces the methodology selected for this research.

Chapter 1:

INTRODUCTION TO THE RESEARCH

The title of this thesis is "*Framework for the Strategic Management of Information Technology (SMIT).*" Chapter 1 introduces the characteristics of the research pursued in this thesis, by describing: the background, problems, aim, research questions, justification, delimitations, methodology, and outline. Section 1.1 describes reasons for explaining the importance of SMIT. Section 1.2 describes the problems related to SMIT. Section 1.3 specifies the aim of this thesis. Section 1.4 proposes research questions. Section 1.5 justifies the research conducted in this thesis. Section 1.6 gives the delimitations of the research. The chapter ends with a presentation of the methodology in Section 1.7, and the outline of the thesis in Section 1.8.

Having given a brief introduction about the aim and outline of Chapter 1, the next section continues by introducing the background of this research.

1.1 Background

Until now, companies have been using IT as a means to achieve advantages. However, the uses and impact of IT have changed constantly. Although, one can find many examples that illustrate changes in the uses and impact of IT, I

start by presenting some examples found in my previous work experiences[1] in 1984–2005.

In the companies I worked with[1], during 1984–1987, information technology (IT) was represented either by a mainframe with terminals, or by a simple PC. At that time, developments in IT were steady. Businesses were learning to use IT as a tool to increase the effectiveness of specific administrative routines, for example calculations, programming, and word processing. The impact of IT was limited to specific functions and could be explored and managed without serious problems.

IT developments in 1985–86 made possible the connection of PCs into local networks. Therefore, in 1987–1990 the company I worked with[2], started to connect their PCs into Intranets, to increase the effectiveness of several functions. This increased impact of IT in the organization contributed to the view of IT as a strategic resource[3].

In the 1990s, a new development in IT, i.e. Internet and the infrastructure to support it, made possible the connection between PCs regardless their geographic location. IT expanded once more its level of impact from internal, i.e. when it was used within the organization, to external, i.e. when it was used between businesses.

During the period 1990–2005 Internet made possible data processing between customers, producers and suppliers, as well as between customers and producers. Since both customers and competitors connect to the Internet, companies have to consider the Internet as a strategic competitive resource.

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1 *Examples of some of the companies and industries that I have been working with in Venezuela: Cordevica (Construction company), Papeles Maracay (Paper industry), Maraven (Oil industry).*

2 *Maraven (Oil industry) For further information see http://www.maraven.pdv.com/.*

3 *The consideration of IT as strategic resource relates to the ability of IT to enhance competitive advantages.*

The developments of new IT technologies such as SMS[4], MMS[5], and 3G[6], are also other examples of resources that challenge competition. In 2005, IT is used as a source of competitive advantages because it solves problems such as geographic distance, transaction costs, availability in time, and global intercommunication. Therefore, in order to be more competitive and increase market shares, companies require fast and updated information.

To sum up, the examples presented above show that within a few years (1984–2005) the uses and impact of IT on competition have changed dramatically. IT has transcended its traditional "back office" role and has evolved toward a "strategic" role with the potential not only to support chosen business strategies, but also to shape new business strategies[7]. Moreover, the Internet has changed the competitive impact of IT from the local to the global market. Internet supporting global communication enables the achievement of global corporative strategies in a way that was not possible before.

Having given an introduction to the uses and impact of IT on competition, the next section introduces problems related to the strategic management of information technology.

1.2 Research Problem

Section 1.1 introduced IT as an important factor for competitive advantages. This section (1.2) continues the analysis of IT, by identifying problems related to the strategic management of information technology.

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4 *SMS: Short Message Service, a technology used to send messages through the GSM net, from another telephone to a PC. Messages can only be 160 characters long.*

5 *MMS: Multimedia Messaging Service, through this service you can send text, sound, pictures and short videos. This is an expanded version of SMS.*

6 *3G also called UMTS Universal Mobile Telecommunications System is a digital cell phone standard that can allow a data transmission of 2 Mbit/s.*

7 *See i.e. Keen (1991), Konsynski & McFarlan (1990), Morton (1991).*

Many researchers[8] today accept that Information Technology (IT)[9] is an important enabler for competitive advantages. Although there is much IT research, the research soon becomes outdated and difficult to apply to new competitive situations. Moreover, managers also have problems matching the developments of IT, and have difficulties getting competitive benefits from IT[10]. Until now many researchers[8] have focused on IT as a main source of competitive advantages. However, in recent years other researchers[11] have focused on the potential to create competitive advantages that resides primarily in the *Strategic Management of Information Technology (SMIT)*. The reason to focus on strategic management is that competition based on IT changes constantly. Therefore, in order to create competitive advantages managers need to combine and adjust business strategies and IT factors to meet the demands of competition.

Much research[12] [13] in the disciplines of Management Science (MS) and Management Information Systems (MIS) contributes to a partial understanding of SMIT. While MS research[12] contributes to SMIT research with strategic and

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8 *See i.e. Porter & Miller (1985), Earl (1989), Clemons & Row (1991), Ciborra (1994), Seddon (2001), Kanter (2003).*

9 *IT abbreviation for Information Technology technologies from computing, electronics, and telecommunications for processing and distributing information in digital and other forms (Source: Encarta English Dictionary.)*

10 *Computer Science Corporation (CSC) made in 2001 a report by surveying the opinions of 1009 IS executives in 31 countries. In the overview of their report on p. 3 they summarized the returns of investments in IT as follows: 14.7 % high (> 15 % in return) , 35,6% medium (< 10% in return), 36.2% unknown, and 1.4% negative. This means that only 14.7 % got more than 15 % in return, while 85.3 got from negative to a highest of 10 percent in return (Computer Science Corporation, 2001, Overview, p. 3).*

11 *See i.e. Andreu & Ciborra (1996), Ciborra (1994), Clemons & Row (1991), Earl (1989), Kanter (2003), Porter (2001), and Porter & Miller (1985).*

12 *See i.e. Barney (1991), Bowman (2003), Clemons & Row (1991), Christensen (2001), Eisenhardt & Martin (2000), Hall (1993), Mata (1995), Minztberg et.al (1999), Porter (1979, 1985, 1991, 1996, 2004), Prahalad & Hamel (1990), Winter (1987).*

environmental factors, MIS research[13] contributes with IT factors. Because these disciplines (MS) and (MIS) differ in their research focus, the integration of prior SMIT research is difficult to achieve. MS and MIS research has limited its focus to either strategic issues, or IT issues. One observation is that existence IT research does not consider changes in IT as technology, and therefore can be partially used to explain the strategic management of IT as competitive factor. Another observation is that, much MS and MIS research does not consider the impact of IT on competition[14]. Consequently, it is difficult to find research that combines strategy and IT in research analysis.

The problem is that even when researchers[11] agree that the *SMIT* is a key factor for competitive advantages, there is little research[15] that contributes to a holistic understanding of SMIT that can be applied to the characteristics of IT today. Considering that SMIT is an important factor for competition, I argue that there is a need for a holistic understanding of SMIT that considers both strategy and IT factors that may affect the creation of competitive advantages. A better understanding of SMIT is relevant for managers who wish to maximize benefits from IT investments, as well as for researchers who want to understand the impact of IT on competition. However, since little research[16] focuses on the analysis of both strategy and IT factors there is a need for further research to develop updated frameworks that can consider both factors. Moreover, further research is needed to update factors of IT that can apply to global competitive scenarios.

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13 *See i.e. Bocij et al. (2003), Boddy et al. (2002), Chandler et al. (1999), Lucas (2005), Luftman et al. (2004), McKeen & Smith (2004).*

14 *With the exception of Porter (2001).*

15 *See i.e. Kalling (1999), Porter (2001), Clarke (2001).*

16 *Although much research can be found using keywords as strategy and IT, the contents of the research often do not include factors from strategy and from IT in the same analysis. Examples of research that analyses both factors can be seen i.e. Kalling (1999), Porter (2001), and Clarke (2001).*

Having given the problem as the need to further investigate *SMIT* focusing on strategy and IT factors, the next section introduces how this thesis aims to pursue SMIT research.

1.3 The Aim of this Thesis

Section 1.2 presented SMIT as a key factor in competition, and the need to pursue further research. Therefore, the aim of this section is to explain how this thesis aims to investigate SMIT.

This thesis explores IT from the perspective of strategic management. From a strategic management perspective, SMIT research can be conducted by proposing theories, models, or frameworks of analysis. While theories and models are use to explain few factors, frameworks are used to explain many factors [17] . Much strategic management research is represented by using frameworks. Although, frameworks have been accused of lacking practical use, they have been recognized as good management tools for developing strategic thinking and for dealing with the future[18]. Consequently, managers use strategic frameworks as tools to communicate visions and to achieve future goals. Considering that SMIT may be related to many factors, the expansion of knowledge through a framework is selected as the most appropriate approach for this thesis. Therefore, this thesis presents new knowledge by the development of a new framework to explore factors related to the *strategic management of information technology*. Therefore the aim of this thesis is:

[17] *See Porter (1991, pp. 97–98).*

[18] *See Stacey (1993) as cited in O'Shannassy (1999, p. 10).*

To develop a framework for exploring the strategic management of information technology in competition

This framework can be used for both academics and managers to understand factors related to the strategic management of information technology in competition.

Having given the aim for this thesis, the next section introduces the research questions used to achieve this aim.

1.4 The Research Questions

Considering that the aim of this thesis is broad in scope, it seems important to identify several research questions to support this thesis. Valid research questions for this thesis should therefore satisfy two conditions. The first condition is that the research questions should support the aim of this thesis, which is to develop a framework. The second condition is that the research questions should lead to the identification of unexplored factors that may explain the *strategic management of information technology*.

Much Management Science (MS) research[19] focuses on generic, competitive advantages, and environment. However, less MS research[20] focuses on the impact of IT on competition. Since much MS research focuses on exploring strategic factors, i.e. from the macro perspective and excludes the exploration of IT factors, then it has difficulties explaining how to manage IT strategically. Today little research[16] combines both strategy and IT as factors related to SMIT.

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19 *See i.e. Barney (1991), Bowman (2003), Clemons & Row (1991), Christensen (2001), Eisenhardt & Martin (2000), Hall (1993), Mata (1995), Minztberg et al., (1999), Porter (1979, 1985, 1991, 1996, 2004), Prahalad & Hamel (1990), Winter (1987).*

20 *c.f. Porter (2001).*

Analyzing the contributions of MS and MIS frameworks in relation to the research questions the following patterns have been noticed. While MS research produces many frameworks that focus on the importance of competitive environment but do not consider the analysis of IT as a competitive factor, Management Information Systems (MIS) research [21] produces many frameworks that focus on IT strengths achieving competitive advantages within an organization[22] but does not consider the importance of the competitive environment[23].

Both competitive environment and IT are important factors to consider for SMIT research. Therefore, one way to increase knowledge of SMIT can be by integrating strategic management factors and IT factors into the same framework of analysis. However, the analysis of previous frameworks in MS and MIS research showed that those frameworks are not updated. Additionally, since those frameworks focus on different factors, the combination of prior research is not easy. Moreover, the combination of existent MS and MIS frameworks, gives limited support when making a strategic analysis of IT. Consequently, an increase understanding about how to relate strategic management to IT is very important in order to achieve competitive advantages. Therefore, it is urgent to develop new frameworks for the SMIT.

Considering the discussion above, this thesis proposes the following research questions:

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[21] *See i.e. Anthony (1965), Ciborra (1994), Earl (1989, 1999), Henderson & Venkatraman (1993), Lee & Bai (2003), McFarlan (1984), Sabherwal & Chan (2001), Ward et al. (1990).*

[22] *See for example Bocij et al. (2003), Boddy et al. (2002), Chandler et al. (1999), Lucas (2005), Luftman et al. (2004), McKeen & Smith (2004).*

[23] *Few MIS frameworks analyze IT within its competitive environment (i.e. Clarke, 2001).*

RQ1: What is the role of strategic management in competition?

RQ2: Which factors are related to strategic management?

RQ3: Which characteristics are related to IT as a competitive factor?

In order to give the reader an introduction to the argumentation followed in this thesis, a summary of some arguments presented in this thesis is included below.

Essentially I argue that competition based on the SMIT, requires not only the exploration of factors related to strategic management, but also the exploration of factors related to IT. The impact of these factors may be on the internal or external environment. Moreover, it is important to understand the possibilities and setbacks of using IT technology as a main competitive factor. The factors analyzed in this thesis in relation to SMIT are Strategic Management (See Chapter 6), Competitive Environment (See Chapter 7), Competitive Strategies (See Chapter 8), and Competitive Factors focusing on IT (See Chapter 9).

This section introduced RQ(1−3) as the research questions used to analyze the data in relation to SMIT and to identify factors that can be used to build a holistic framework for SMIT. The next section introduces some justifications for this research.

1.5 Justification for the Research

Section 1.2 introduced some contributions of MS and MIS research to the SMIT and explained that an integration of factors related to strategic management and IT is needed in order to understand SMIT. This section continues with an analysis of the contributions of MS and MIS research and their limitations in exploring SMIT.

Many disciplines pursue research related to the SMIT. However, only two disciplines are parent disciplines for SMIT research: "Management Science (MS)" and "Management Information Systems (MIS)" (See Chapter 3).

The disciplines of Management Science (MS) and Management Information Systems (MIS) produce much research related to the strategic SMIT. Although, both disciplines MS and MIS, agree that IT is a source of competitive advantage, their research focus is different and consequently difficult to integrate (See Chapter 4). While MS research focuses on analyzing the competitive environment, MIS research focuses on analyzing IT as a technology. These separate perceptions give only a partial explanation of the real meaning of SMIT. The next section summarizes the contributions of MS and MIS research to SMIT in order to understand the limitations of their approach.

Analyzing the contributions of *Management Science (MS)* research to SMIT, the following patterns have been found. One pattern is that much MS research focuses on strategies for competitive advantage, but do not include IT in the analysis, with the exception of Porter, 2001. Another pattern is that MS research has difficulties explaining the relationship between IT investments and benefits, and therefore uses paradoxes[24] in its explanations.

In contrast, the contribution of *Management Information Systems* (MIS) research to SMIT can be summarized as follows. First, much MIS research[25] focuses on IT[26], IT strategies[27] [28], and the Management of IT[29]. However, few

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[24] *See i.e. the IT productivity paradox, compare Brynjolfsson (1993), Clemons & Row (1991), Mata et al. (1995), Sambamurthy (2000), Strassman (1985).*

[25] *See i.e. Bocij et al. (2003), Boddy et al. (2002), Chandler et al. (1999), Lucas (2005), Luftman et al. (2004), McKeen &Smith (2004).*

[26] *See i.e. Davis (2001), Orlikowski (1992).*

[27] *With time, the research interest in IT strategy issues has become more and more relevant with the increasing ability of IT to enable competitive advantages. See i.e. Porter & Miller (1985), Clemons & Row (1991), Ciborra (1994), Kalling (2000), Hidding (2001), Smaczny (2001), Rapp, W. (2002), Dehning & Stratopoulos (2003), and Kanter (2003).*

MIS researchers[30] focus on IT within its strategic context. Therefore, one can say that much MIS research focuses on the analysis of IT within the boundaries of an organization, i.e. the micro perspective, and does not consider the external environment, i.e. the macro perspective. Consequently, MIS research has some gaps in exploring SMIT. One gap is that the meaning of IT has not been researched in detail[31]. Moreover, knowledge about strategy theories in the research of the management of IT is lacking[32], and consequently it is difficult to integrate IT strategy models[33].

Comparing the contributions of MS and MIS to SMIT, the following patterns are found. While MS focuses on factors related to the "competitive environment" and has a macro perspective, MIS focuses on factors related to "IT" and has a micro perspective. Considering that the understanding of SMIT demands the understanding of macro and micro perspectives, MS and MIS research contributes to SMIT with only partial answers. Moreover, the differences in the research focus of MS and MIS makes difficult the integration of both perspectives for the understanding of SMIT.

This section has shown that there is still a need for a broader understanding of the *strategic management of information technology* in factors related to strategy and IT. Therefore, the role of this thesis is to expand the understanding of SMIT by exploring strategic management aspects. This section is designed only as an introduction to the research; therefore, further justifications are presented in Chapters 3–4.

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28 *See i.e. Besaou (1998), Earl (1989, 1992, 1993, 1994, 1999, 2000; 2001, 2003), Henderson & Venkatraman (1993), Chan (1999), and Sabherwal et al.(2001).*

29 *See i.e. Earl (1989, 1992, 1993, 1994, 1999, 2000, 2001, 2003).*

30 *See i.e. Clarke (2001).*

31 *See i.e. Mason & Mitroff (1973), Orlikowski & Iacono (2001, p.121).*

32 *See Sambamurthy (2000, p.3).*

33 *See i.e. Callon (1996), Kirchmer (1998).*

Having given the contributions of MS and MIS to SMIT and the argumentation for continued further SMIT research, the next section analyzes gaps in prior research exploring SMIT, in order to identify supportive research questions.

1.6 Delimitations of the research

Sections 1.1–1.5 have given the foundations for this research. Therefore, the aim of this section is to present the limitations considered in this thesis.

Scope of analysis

The analysis of the SMIT as phenomenon can be studied from many disciplines (See Chapter 3), and many different perspectives. However this thesis has selected two parent disciplines from the research of SMIT i.e. Management Science (MS) and Management of Information Systems (MIS) (See Chapter 4). This thesis focuses therefore on the perspectives of *Management Science* (MS), and *Management Information Science* (MIS) according to Figure 8. This thesis focuses on MS and MIS as parent disciplines for SMIT research (See chapters 3–4), and although there are many others perspectives in others disciplines they are considered as out of the scope of this thesis.

Much strategy research is found in many disciplines; therefore this thesis focuses only on research conducted in the discipline of Management Science. Moreover, this thesis only considers factors related to strategic analysis[34], and strategic choices. The scope of this thesis is limited to the strategic analysis process and does not consider the formulation of strategies. Although this thesis is based on the analysis of two disciplines, results must be categorized within the MS discipline, but can still be used in MIS.

[34] *For details about strategic analysis, strategic choice, and strategy implementation see Clarke (2001, p. 29).*

The analysis of strategy in this thesis is limited to the consideration of competitive strategies. Although other researchers may agree that strategy should be analyzed in terms of corporative strategies, business strategies and operational strategies, that approach is not considered in this analysis. Instead this thesis has focused on the identification of factors that are important to consider in achieving competitive advantages, regardless of the scope of the competitive strategy.

A detailed presentation about the focus of analysis in this thesis is presented in Section 5.2. Having given the limitations for this research, the next section introduces the methodology used to find the answers.

1.7 Methodology

Sections 1.1–1.6 introduced the foundations for this research. The aim of this section is to present a brief description of the methodology used to find the answers in this thesis.

Considering that the aim of this thesis is the development of a new framework to explore SMIT, the best way to collect relevant data is by conducting a theoretical, explorative analysis. Therefore, the methodology chosen for this research uses a qualitative, theoretical, explorative, and conceptual approach.

The research is *qualitative*, because it selects specific sources of data that are analyzed in detail. The research is theoretical because it uses MS and MIS research as data sources. The research is *explorative,* i.e. Chapters 1–4, because it explores MS and MIS research to identify gaps related to SMIT. The research is also *conceptual,* i.e. Chapters 6–10, because produces new knowledge, i.e. definitions, factors and relations between the factors regarding SMIT. The conceptualization is based on a meta-analysis of MS and MIS research that attempts to explore SMIT as a phenomenon. The meta-analysis identifies factors and relationships used to build a holistic framework for the SMIT. A further discussion about the methodology used in this thesis is presented in Chapter 5.

1.8 Outline of this Thesis

The thesis: *A Framework for the Strategic Management of Information Technology* is about constructing a framework for understanding the *strategic management of information technology*. This section outlines the contents of this thesis and introduces the reader to the reasoning followed in this thesis.

The thesis contains two parts: Part I and Part II; "Part I: Foundations for the Research", and "Part II: Analysis and Results." Each part develops specific themes and therefore includes several chapters. While Part I addresses the foundations for this research and identifies research issues to explore in this thesis, Chapters 1–5, Part II analyzes the data in relation to the research issues proposed in Part I and proposes answers, Chapters 6–11. A brief description of the contents presented in this thesis follows below.

PART I: FOUNDATIONS FOR THE RESEARCH. Part I, gives an introduction to this research by describing the problems and explaining the research methodology used in this thesis. Part I includes Chapters 1–5.

Chapter 1: *Introduction to the Research*. This chapter describes the background, problems, and definition of the research questions investigated in this thesis. The chapter introduces the *strategic management of information technology* (SMIT) by presenting the problems of prior research.

Chapters 2–4 analyze the meaning of SMIT and the gaps found in previous research. The aim of these chapters is to analyze previous literature and to identify unexplored factors and relationships between strategic management and IT.

Chapter 2: *Concepts Related to the Strategic Management of Information Technology (SMIT)*. This chapter, defines concepts related to SMIT research, and proposes a definition of SMIT to be used as the basis for this thesis.

Chapter 3: *Scientific Disciplines Related to SMIT Research*. Chapter 3 introduces the scientific disciplines that pursue research related to SMIT, with the aim of

identifying parent disciplines, which research can be used as sources of data for this thesis.

Chapter 4: *MS, MIS, and SMIT Research*, introduces the research of parent disciplines Management Science (MS), and Management Information Systems (MIS). The chapter identifies their contributions and gaps in relation to SMIT research.

Chapter 5: *Research Methodology*, gives a description of the methods and theories that support the contents of this thesis.

PART II: ANALYSIS AND RESULTS

PART II includes Chapters 6–11 and presents an analysis of strategic management factors related to SMIT. In order to understand the connections between the contents of each chapter a brief description is presented below.

Chapter 6: *Strategic Management* addresses the role of *strategic management* in competition and identifies factors related to SMIT. It introduces factors such as competitive environment, competitive strategies, and competitive factors, which are discussed in the following chapters (7–9).

Chapter 7: *Competitive Environment* analyzes the role of the competitive environment in competition and its effects on competitive strategies, and competitive factors.

Chapter 8: *Competitive outcome and Competitive Strategies,* discusses factors that influence competitive outcomes and the development of competitive strategies.

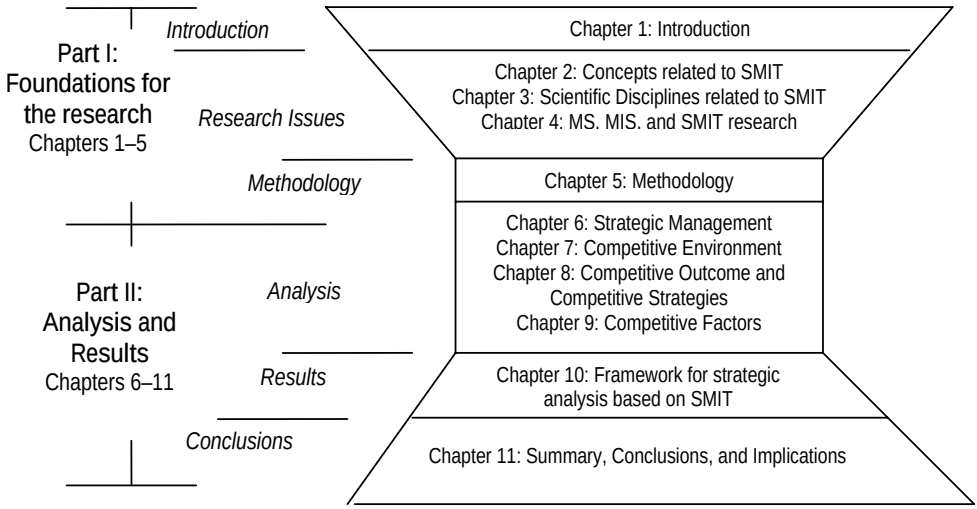
Chapter 9: *Competitive Factors* discusses the role of competitive factors in enabling competitive advantages, and analyzes the role of IT as a main competitive factor.

Chapter 10: *Framework for Strategic Analysis based on SMIT* summarizes the results of Chapters 6–9 in a common framework of analysis.

Chapter 11: *Summary, Conclusions and Implications* summarizes the conclusions of the results presented in Chapters 6–10. Moreover, this chapter presents the implications of the results of this thesis for managers and academics. Additionally, it presents the role of this thesis in future research, and it describes how the findings of this thesis will be used in a PhD dissertation.

Figure 1 illustrates the disposition of Chapters 1–11.

Figure 1: Thesis – Outline



(Source: Developed for this thesis from Chapters 1–11)

Figure 1 contains several blocks of different width. The width of each block indicates the scope of analysis. A wide block means a broad scope and a narrow block means a narrow scope. The sequence of the blocks shows how each Part and Chapter contributes to the whole analysis. For instance, Part I gives the foundations for the research and constitutes the basis of the analysis presented in Part II. Part II presents the answers to the research issues proposed in Part I.

Figure 1, shows that this thesis contains two parts: Part I, and Part II. Part I establishes the foundations for the research and Part II gives the analysis and the results of the research. The position of the blocks in the figure shows how the contents of each chapter are used as a platform for the following chapters. The width of the blocks shows the focus of each chapter (for example, a wide block means a wide focus and a narrow block means a narrow focus).

Part I is designed as the foundation of the research and with a wide introduction represented by (Chapter 1). Chapter 1 is gradually narrowed into a specific theme core related to SMIT that is developed in Chapters 2–4. Later the methodology followed in this thesis is presented in Chapter 5. Part I states the characteristics of this research and gives the basic conditions for the development of the following chapters. Part II contains the answers of this research and uses Chapters 1–5 as foundations for the research. Chapter 6 initiates the second part and starts a broad discussion of strategic management. Strategic management is investigated to identify factors related to competition that are further discussed in Chapters 7–9. Chapter 10 integrates the findings of Chapters 6–9 into a common framework. Finally, Chapter 11 presents the conclusions of the research by integrating the theoretical foundations given in Part I, and the answers given in Part II. Figure 1 illustrates the outline of this thesis.

Having given the contents of Chapter 1, the next section presents the summary.

Summary Chapter 1

Chapter 1 presented an introduction to the research in this thesis.

This chapter presented the research issues considered in this thesis by describing the aim (1.3) and the research questions (1.4). Table 2 summarizes research issues.

Table 2: Research Issues

Issue	Content	See
Research Problem	The need to investigate the relationship between strategic management and IT in competition.	Section 1.2
Aim	To develop a framework for exploring the strategic management of information technology SMIT in competition.	Section 1.3
Research questions	RQ1: What is the role of strategic management in competition? RQ2: Which factors are related to strategic management? RQ3: What characteristics are related to IT as a competitive factor?	Section 1.4

(Source: Developed for this thesis from Sections 1.2–1.4)

This chapter has also justified the research (1.5) by identifying some knowledge gaps in research related to SMIT. The methodology used to find answers to the research questions is an *exploratory qualitative conceptual approach* (1.7). The *delimitations of the research* (1.6) are the analysis of data from the disciplines of Management Science and Management Information Systems. The *outline* of this thesis (1.8) includes two major parts: Part I that gives the foundations for the research, in Chapters 1–5, and Part II that presents the analysis and the results of the data collected, Chapters 6–10.

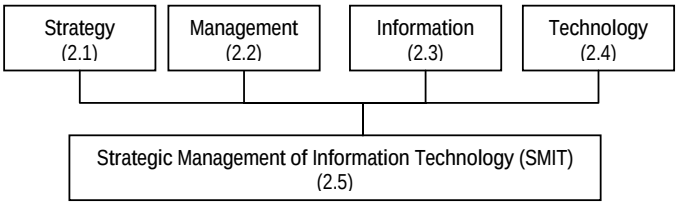
Chapter 2:

CONCEPTS RELATED TO THE STRATEGIC MANAGEMENT OF INFORMATION TECHNOLOGY (SMIT)

Chapter 1 presented an introduction to this thesis. Chapter 2 continues the research by investigating the meaning of *strategic management of information technology* (SMIT). The aim of Chapter 9 is to explore scientific knowledge related to SMIT.

Chapter 2 studies the epistemological components of *strategic management of information technology*. Chapter 2 presents definitions of *strategy*, *management, information*, and *technology* and uses these concepts as data sources to evaluate their contributions to SMIT. Figure 2 illustrates the epistemological analysis made in this Chapter. Each box in Figure 2 shows the name of the concept analyzed and the section that presents the analysis. For instance, the box with the title *"strategy"* (2.1) means that the concept of *strategy* is analyzed in Section 2.1. The analysis of the epistemological components is conducted as follows. First, the concepts of *strategy* (2.1), *management* (2.2), *information* (2.4), and *technology* (2.4) are analyzed separately. Finally, all concepts are combined into one definition to describe the meaning of *strategic management of information technology* (2.5) that is used as the basis for this research.

Figure 2: Analysis of the epistemological components of the strategic management of information technology (SMIT), from the perspectives of MS and MIS



(Source: Developed for this thesis from Sections 2.1–2.5)

The small boxes in Figure 2 represent the definitions that are analyzed. The numbers within parentheses indicate the section that contains the analysis. Finally, these definitions are integrated into a holistic definition for SMIT presented in Section 2.5.

This section has illustrated the structure of the analysis presented in this Chapter; the next section presents an analysis of the concept strategy.

2.1 The meaning of Strategy

The first term that needs an explanation regarding *strategic management of information technology* is the term *strategy*. Strategy is a central concept in the analysis of this research, and therefore the aim of this section is to describe its meaning. The discipline of Management Science and the field of Business Strategy studies strategy as a concept. However, since Management Science is a convergence of many other disciplines[35], the definition of strategy may vary depending on the perspective of analysis. In order to illustrate changes in the

[35] *Such as: Economics, Organization Theory, Business Administration, marketing, finance, and geography (see Section 3.3)*

aim and role of strategy some definitions have been selected from several authors[36] and are summarized in Table 3.

Table 3: Definitions of *Strategy*

Author	Definition	Discipline
Andrews (1965)	"Strategy is the pattern of major objectives, purposes of goals […] stated in such a way as to define what the business the company is in or is to be in and the kind of company it is or is to be" (Source: Andrews, 1965 as cited in O'shannassy, 1999, p. 3)	Management Science
Andrews (1980)	"… strategy is the pattern of decisions in a company that determines and reveals its objectives, purposes or goals,[which] produces the principal policies and plans for achieving those goals, and defines the range of business the company is to pursue, the kind of economic and human organization it is or intends to be and the nature of the economic and non-economic contribution it intends to make to its shareholders, employees, customers and communities." (Source: Andrews ,1980; as cited in Mintzberg et al.,1998 p. 51)	Management Science
Porter (1991)	"Strategy is the act of aligning a company and its environment. That environment, as well as the firm's own capabilities are subject to change. Thus the task of strategy is to maintain a dynamic, not a static balance" (Source: Porter, 1991, p. 97)	Management Science

Continues

[36] *Authors such as Andrew (1965, 1980), Cardullo (1996), Mintzberg & Quinn (1991), Porter (1991).*

Continued

Author	Definition	Discipline
Mintzberg & Quinn (1991)	"Strategy is the pattern or plan that integrates an organization's major goals, policies, and action sequences into a chosen whole" (Source: Mintzberg and Quinn, 1991, p. 5)	Management Science
Cardullo (1996)	"…a strategy is used to allocate factors based in the organization's needs and should manage: 1) core competencies and shortcomings, 2) unanticipated changes in the environment, and 3) contingent moves by competitors or agents[37]." (Source: Cardullo, 1996, p. 46)	Management of Technology

(Source: Definitions selected for this section from References)

Table 3 shows that *strategy* definitions are usually described in terms of *aim* and *role* in business organizations. The table also shows that *strategy* definitions have changed over time. One example of changes in the role of strategy is shown in Andrew's (1965, 1980) definitions. While in 1965, he describes strategy as related to any goals that define the future of the business; in 1980, he describes strategy as related only to *economic* or *non-economic* goals. Therefore, over time, strategy usually relates to financial goals. Another change in the role of strategy is shown in the definition of Mintzberg (1991), who suggests that strategy plays an *integration* role between major goals of an organization.

Porter (1991) focuses on strategy as the dynamic interaction between a business organization's capabilitities and its environment. Moreover, Porter (ibid) argues that strategy balance the relations between the organization and its environment.

[37] *Agent is used meaning process launched adversely or unintentionally by nature or other components of the environment (Cardullo, 1996, p. 47)*

Cardullo (1996) defines strategy from the perspective of Management Technology and adds some factors to the role of strategy. One factor is *core competencies*, or areas that the business organization can perform with excellence. Another is the need to consider the competitive environment and identify possible futures changes as well as competitors' strategies. Moreover, it stresses the need to allocate factors in the organization. This definition highlights the complexity of the strategy role.

2.2 The meaning of Management

The second term that needs an understanding in SMIT is *management*. Usually, *management* definitions describe either the actions or role of the manager. Table 4 includes some management definitions from the discipline of Management Science.

Table 4: Definitions of *Management* from the perspective of Management Science

Author	Definition
Frew (1971)	"Management is the process of moving an organization, either the organization at large or a sub/organization, through its environment toward the accomplishment of goals" (Source: Frew, 1973, p. 397)
Johannsen & Page (1986)	"1. Effective use and coordination of factors such as capital, plant, materials and labour to achieve defined objectives with maximum efficiency. 2. People responsible for directing and running an organization." (Source: Johannsen & Page, 1986, p. 195)

(Source: Selected for this section from References)

As Table 4 shows, *management* definitions relate to the achievement of specific goals. Moreover, in Johannsen & Page's definition, *management* may be interpreted in two ways: as the actions done by the manager, or as the manager *per se* or the people that execute those actions. Moreover, this definition also relates management to the effective coordination of [business] factors in order to achieve specific goals. The role of the *manager* is to achieve different goals,

and one of these goals may be to enable competitive advantages. However, the achievement of competitive advantages is not traditionally related to management, but rather to strategic management.

Definitions of management are also found in the discipline of Management Information Systems. However, the definitions found in MIS are always related to the management of IT or IS as technology. Moreover, the terminology used for management in MIS uses several names such as "Management of Information Systems (MIS)," or "Information Management (IM)"[38]. Moreover, these terms are also used for the scientific discipline as well. Table 5, presents some management definitions from the MIS perspective.

Table 5: Definitions of *Management* from the perspective of Management Information Systems

Author	Definition
Ives et al (1980)	"MIS [Management Information Systems] is the systematic investigation of the development, operation, use and /or impact of an information (sub) system in an organizational environment" (Source: Ives et al. , 1980, p. 1)
Lundeberg, et al., (1995)	"Information Management [Management of Information Systems] as an academic field is the study of structures and processes related to the use of information technology by persons in business processes." (Source: Lundeberg et al., 1995, p. 195)

Continues

[38] *See i.e. Davis (1991), Lundeberg et al. (1995, p. 95).*

Continued

Author	Definition
Clarke (2001)	"The management of IS [IT] becomes the design, development and management of technological solutions to identify problems. However, whilst most frequently information systems management is pursued as predomnantical technical endeavor, it none the less has to work within a given social framework" (Source: Clarke, 2001, p. 7)

(Source: Definitions selected for this section from References)

As shown in Table 5, the definition presented by Yves et al. (1980), describes the activities that the IT manager should execute within the function. Moreover, this definition refers to the management of "information systems." This is because, most of the IT developments in 1980s (the date of this definition) relate to information systems. Another observation is that one important activity of management is the analysis of the uses and impact of information systems in the organizational environment. Lundeberg's, definition, includes new components to MIS perceptions of management: information technology, business processes, and persons. Clarke's definition shows that MIS perception of *management* is still ambiguous. According to this definition, first *technological solutions* are created and afterwards are used to solve existing *problems*. This approach to technology development is not competitively effective because it solves designers' problems, instead of managers' problems.

2.3 The meaning of Information

The third term that needs understanding in SMIT is *information*. Table 6 presents some definitions of *information*.

Table 6: Definitions of *Information*

Author	Definition	Discipline
Langefors (1966, 1993)	The infological equation I = i (D, S, t) where I is the information produced from the data, D, and the recipient prior knowledge, S, by the interpretation process, i, during the time, t." (Source: Langefors, 1966, p. 1; 1993, p. 150)	MIS
Mason et al. 1973)[39]	"Information is knowledge for the purpose of taking effective action" (Source: Mason et al., 1973, p. 475)	MIS
Ackoff (1989)	"Information is contained in descriptions, answers to questions that begin with such words as who, what, when, and how many" (Source: Ackoff, 1989, p. 3)	MS
Turban, et al. (2001)	Information: data that has been organized so that they have meaning and value to the recipient. (Source: Turban et al., 2001, p.45)	MIS

(Source: Definitions selected for this section from References)

As shown in Table 6, there are several interpretations of the information concept. Langefors (1966, 1993) perceives Information (I) as a relative concept that is dependent on data (D), the recipient's prior knowledge (S) and the time (t) available for the interpretation process. Moreover, he highlights the relationship between the pre-knowledge of the person that interprets the data. According to Langefors (ibid), information may have different meanings depending on the person that receives and interprets the data. Analyzing this definition from a strategic perspective, the value of the information is defined by the perceived value of the person receiving the information. Therefore, the successful use of information technology is also dependent on the preliminary knowledge of the people working with that information. In case their

[39] *See Mason et al. (1973, p. 475) as cited by Davis (1991).*

knowledge is not adequate for the interpretation of the information provide by information technology learning may be considered as an alternative to create the necessary preliminary knowledge.

Mason (1973) defines information as *knowledge,* used for the purpose to *take effective action*. However, many researchers, i.e. Ackoff (1989), Turban et al. (2001), argue that there are differences between information and knowledge. To illustrate these differences some definitions of knowledge are included in Table 7.

Table 7: Definitions of *Knowledge*

Author	Definition	Discipline
Ackoff (1989)	"Knowledge can only be obtained in two ways: either by transmission from another who has it, by instruction, or by extracting it from experience. In either case the acquisition of knowledge is learning." (Source: Ackoff, 1989, p. 4)	Management Science
Turban et al. (2001)	"Information that has been organized and processed to convey understanding, experience and expertise as they apply to a current problem or activity. Data: any description of things, events, activities, and transactions that are recorded, classified, and stored, but not organized to convey any specific meeting." (Source: Turban et al., 2001, p.45)	Management Information Systems

(Source: Definitions selected for this section from References)

As Table 7 shows both Ackoff (1989) and Turban et al. (2001) agree that knowledge is an internal process related to the understanding and experience of information. Therefore, the definition of Mason (1973) (See Table 6) can be argued regarding differences between information and knowledge.

2.4 The meaning of Technology

The last term that needs understanding in SMIT is *technology*. To understand the meaning of Technology the etymology of the word technology is presented in Table 8.

Table 8: Definitions of *Technology* from the perspective of Management Science

Author	Definition
Encyclopedia Britannica (2006)	"[Technology] is the development over time of systematic techniques for making and doing things." (Source: technology, history of. (2006). In Encyclopedia Britannica. Retrieved June 9, 2006, from Encyclopedia Britannica Online: http://search.eb.com/eb/article-9108659)
Cardullo (1989)	"The term [technology] is derived from the Greek words tekhnë, which refers to an art or craft, and loggia, meaning an area of study; thus, technology means the study or science of crafting" (Source: Cardullo, 1996, p. 1)
Levi (1998)	"Technology can be defined as the assembly of hardware and software means and tools used by human beings to achieve socioeconomic goals." (Source: Levin, 1998, p. 9)

(Source: Definitions selected for this section from References)

According to Cardullo (1996) *technology* is related to *craft*. Craft is by definition a synonym for art, and therefore it may be manifest in different forms. Considering *technology* as an *art* means that technology expresses the creativity of its designer and consequently changes with every designer. Therefore, *technology* may have as many different manifestations as the amount of designers, and the manifestations of technology can be sometimes innovative and revolutionary.

In contrast, Levi (1998) focuses on technology as a combination of software and hardware used to achieve social goals. Although this definition is not related to IT, it shows that technology is embedded as a combination of hardware and software and that it is used to achieve social goals. For instance,

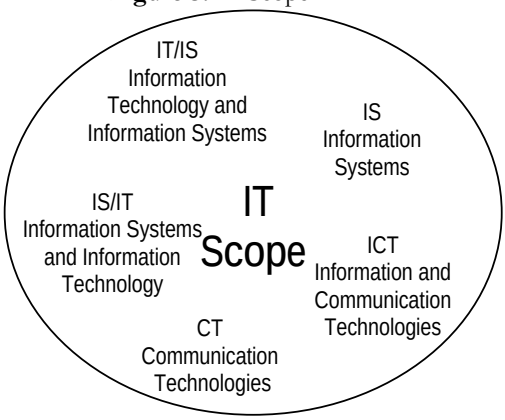
technology used in manufacturing industries is highly digitalized, and integrated into different systems.

One can observe that perceptions of technology have changed over time. First, the Cardullo (1989) perceives *technology* as a unique manifestation of art. Later Levi (1998) perceives technology from a *sociological* perspective, and as a medium to enable advantages.

Management Information Systems also develops definitions of technology; however, MIS definitions are specifically related to IT as technology.

Information technology (IT) is also known as: "Information Systems (IS)", "Information and communication technologies (ICT)" [40], "Information Systems and Information Technology (IS/IT) [41]", and also "Information Technology and Information Systems (IT/IS)"[42]. An illustration of the scope of IT is shown in Figure 3.

Figure 3: IT Scope



(Source: Developed for this thesis from Section 2.4)

[40] *See i.e. Aerts et al. (2004).*

[41] *See i.e. Caldeira & Ward (2002).*

[42] *See i.e. Lee et al. (2003).*

Although, much MIS research was used in the analysis, it was difficult to find definitions of IT[43]. However, the definitions found are presented in Table 9.

Table 9: Definitions of *Information Technology* from the perspective of Management Information Science

Author	Definition
Davis (1991)	"The systems [Information Technology] is an integrated, user/machine system providing information and information processing to support the strategy, operations, management, analysis, and decision making functions in an organization." (Source: Davis, 1991, p. 7)
Orlikowski (1992a)	"The structurational model of technology comprises the following components: (i) human agents–technology designers, user, and decision-makers, (ii) technology–materials artifacts mediating task execution in the workplace, and (iii) institutional properties of organizations, including organizational dimensions such as structural arrangements, business strategies, ideology, culture, control mechanisms, standards operating procedures, division of labor, expertise, communication patterns, as well as environmental pressures such as government regulation, competitive forces, vendor strategies, professional norms, state of knowledge about technology, and socio/economic conditions." (Source: Orlikowski, 1992, p. 409)

Continues

[43] *For further discussion see Section 4.3.3 Gaps in MS and MIS research in relation to SMIT: Gaps in MIS research.*

Continued

Author	Definition
Rodriguez & Ferrante (1996)	"The meaning of information technology is almost universally understood. It comprises all the technological factors for storage, manipulation, and retrieval of data, which are thus transformed into information which is useful to society." (Source: Rodriguez & Ferrante, 1996, p. 3)
Morath & Schmidt (1999)	IT includes hard components (for example, computers, fax machines, cellular phones), hard/soft components (for example, Internet, intranet, network and video-conferencing systems, virtual reality) and soft components (for example, group ware, EDI programs, learning management systems, groupware. (Source: Morath & Schmidt, 1999)
Weill & Broadbendt, (1998)	"We define information technology as a firm's total investment in computing and communications technology. This includes hardware, software, telecommunications, the myriad of devices for collecting and representing data (such as supermarket point-of-sale and bank automatic teller machines), all electronically stored data, and the people dedicated to providing these services. It includes the information technology investments implemented by internal groups (insourced) and those outsourced by other providers, such as IBM Global Services or EDS. " (Source: Weill & Broadbendt, 1998, p. 6)

(Source: Definitions selected for this section from References)

As shown in Table 9, two of the definitions, i.e. Davis, 1991, Rodriguez & Ferrante (1996), omit the descriptions of IT as technology, which is paradoxal. Although the definitions omit the descriptions of technology in a way to generalize, one can argue that the analysis of IT is different depending on the scope of the technology used. For instance, the analysis of PC as a single computer is different from the analysis of PC in networks or Internet. This is because the scope of the analysis is different depending on the scope of the technology considered in the analysis. On the other hand the definition of Morath & Schmidt (1999) specifies the technology considered in the analysis.

For instance, Orlikowski (1992a) perceives technology as an artifact that interacts with the organization, from a *structural perspective*, and expands the focus of analysis for IT. This last definition shows that the description of the technology considered in the analysis gives also an indication about the scope of the analysis.

Davis' (1991) definition includes several relevant factors that describe IT as competitive factors: first the perception of IT as a system or holistic perspective, and second the perception of IT as a subordinated function to strategy and management.

Orlikwoski (1992a) considers technology as an actor that interacts with the organization. Therefore she analyzes technology from a structurational view and includes human agents, technology artifacts, and institutional properties in her analysis.

In contrast, the Rodriguez & Ferrante definition is rather diffuse but is interesting because it emphasizes that the meaning of IT is rarely discussed in prior research. This statement supports the position of this thesis as well as the propositions of Mason & Mitroff (1973), and Orlikowski & Iacono (2001).

Having given the meaning of information and technology as separate units, this thesis analyzes the meaning of information technology.

2.5 The Meaning of the Strategic Management of Information Technology (SMIT)

Sections 2.1– 2.4 introduced definitions related to the *strategic management of information technology (SMIT)*. This section integrates the key factors of the contents presented in Sections 2.1– 2.4 into a whole and proposes a definition of SMIT. Therefore, the aim of this section is to build a definition of SMIT that can be used as a base for the research pursued in this thesis.

Let us start the discussion by analyzing similarities and differences between *strategy* and *management*. When comparing the *strategy* (2.1) definition given by

Cardullo (1996) (See Table 3) with the *management* (2.2) definition given by Johannsen & Page (1986) (See Table 4), one can see that they present both similarities and differences.

One similarity is that the role of both strategy and management is to select resources and achieve economic goals. One of the differences is that while strategy is concerned with the achievement of strategic goals, management is concerned with the effective use of resources. Another difference is that while strategy definitions usually focus on the role of competitive strategies (See Section 2.1), management definitions usually focus on the role of the manager as a coordinator of resources (See Section 2.2).

Section 2.4 presented the meaning of *information technology* (IT) from the perspective of strategic management. According to strategic management perspective, the importance of IT is related to its value in competition. As a result of the analysis and integration of the definitions presented in section 2.1– 2.4 a definition for SMIT is presented below.

The strategic management of information technology (SMIT) is related to the achievement of a business organization's objectives by charting, planning, and designing the uses of information technologies and information strategies to enable advantages in the competitive environment.

(Source: Developed for this thesis from Sections 2.1– 2.4)

This definition implies that SMIT involves two activities. One activity is the strategic analysis of the competitive environment, and another activity is the management of information technology as a competitive factor.

Summary Chapter 2

Chapter 2 presented separate definitions of the components of SMIT. Therefore, the chapter presented single definitions such as *strategy* (2.1), *management* (2.2), *information* (2.3), and *technology* (2.4). The contents of sections 2.1 – 2.4, were integrated into a definition of strategic management of

information technology (2.5). The definition proposed for SMIT is used as the basis of this thesis, and it was stated as:

> *The strategic management of information technology (SMIT) is related to the achievement of a business organization's objectives by charting, planning, and designing the uses of information technologies and information strategies to enable advantages in the competitive environment.*
>
> *(Source: Section 2.5)*

After presenting research into SMIT, this thesis continues with Chapter 3 that analyzes previous research in order to identify new factors for explaining SMIT.

Chapter 3:

SCIENTIFIC DISCIPLINES RELATED TO SMIT RESEARCH

Chapter 2 presented some definitions related to the subject of SMIT. This Chapter identifies parent disciplines that can be used as sources of data for this thesis.

The structure of Chapter 3 is as follows. The chapter starts with an introduction to difficulties related to the identification of scientific knowledge and scientific disciplines (3.1), and continues with a further analysis of the definitions presented in Chapter 2 as sources of scientific knowledge[44] to identify possible parent disciplines (3.2). The chapter continues by identifying relevant disciplines for the exploration of SMIT (3.3). Finally, parent disciplines for the research in this thesis are presented in Section 3.4.

3.1 Scientific knowledge vs. scientific disciplines

Today, there are many discussions that defend the positions of scientific knowledge and scientific disciplines[45]. Therefore, this sections starts by

[44] *The term scientific knowledge is also known as the domain of knowledge.*

[45] *Some examples of research that discusses the position of the discipline Management of information technology are Banville, & Landry (1989), Davis (1991, 1995), Lundeberg et al. (1995), Benbasat & Zmud (2003).*

discussing factors that may be important to consider in identifying scientific disciplines related to SMIT research.

Even though it seems easy to understand that there are differences between the terms *scientific knowledge* and *scientific disciplines*, it is difficult to explain the differences. One reason is that scientific disciplines emerge with the production of scientific knowledge. However, the production of scientific knowledge is not a sufficient condition to warrant the existence of a scientific discipline. Another reason is that discipline implies the establishment of boundaries, which sometimes are difficult to define. Therefore, the transformation from scientific knowledge towards scientific discipline is gradual and may take many years. The gradual pace of this transformation makes it difficult for researchers to define the limits between scientific discipline and scientific discipline. Consequently, researchers [46] in new disciplines[47] have ongoing debates about the establishment of their disciplines. Therefore, one aim of this section is to present the position of this thesis regarding the identification of scientific disciplines.

For the purpose of this discussion, one can consider science as a representation of a scientific discipline, since both science and scientific disciplines create knowledge that can be reproduced, by using specific research methodologies that are related to specific scientific areas. Consequently both produce knowledge that may be replicable by other scientist. A definition of science by Arsham (2005) is included below to continue the discussion.

Another example is the discussion about the position of Information Science by Webber (2003).

46 *See i.e. Davis (1991, 1995), Jackson (2001), Lundeberg et al. (1995), and Webber (2003).*

47 *For instance the discipline of Management Information Systems (MIS).*

> *"Science is a continuing search; it is a continuing generation of theories, models, concepts, and categories"*
>
> *(Source: Arsham, 2005)*[48]

Arsham (2005) relates *Science* to the creation of continuous scientific knowledge, represented by *theories, models, concepts, and categories*. However, since the production of scientific knowledge does not guarantee the existence of a scientific discipline; the next question is what defines scientific disciplines? This question is not easy to answer for several reasons. One reason is that scientific disciplines emerge over time, and the discussions between scholars, may take many years[49]. Another reason is that some disciplines[50] have well defined theories and paradigms, while others do not[51]. This makes difficult the definition of scientific disciplines. Moreover, some sciences use theories and paradigms of other disciplines (cf. the discipline of Management of Information; which uses theories from Organizational Science, Management Science, and Economics for its research). Consequently, the definition of a pure scientific discipline is diffuse, and therefore, it can take many years before researchers accept the beginning of a new scientific discipline. Moreover, when disciplines emerge as a combination of other disciplines they have great difficulties being accepted as scientific disciplines[52].

Therefore, it is difficult to define when scientific knowledge transforms into a scientific discipline. However, in order to identify scientific disciplines in this research the recommendations of Becher & Trowler (2001) were followed in the analysis presented in Section 3.2 and are therefore included below.

---

48 *See Arsham (2005).*

49 *See the discussion of Information Science as discipline, in Webber (2003), and the discussions of MIS as a discipline in Banville & Landry (1989), Benbasat & Zmud (2003).*

50 *For example, the disciplines of Physics, and Nature Science.*

51 *For example, the disciplines of Social Science, Management Science, and Management of Information Systems.*

52 *See i.e. Banville, & Landry (1989), Davis (1991, 1995), Lundeberg et al. (1995).*

> *"The existence of academic departments, and their place within the structure of the university; Graduate students; the degree to which an international community has emerged; the existence of professional associations and journals; Identification of self with the discipline (i.e. 'I'm a chemist'); Idols and artifacts which express allegiance to the discipline and its heroes; Language".*
>
> *[Source: Becher and Trowler (2001) as cited in Webber (2003, p.315)]*

This section presented some factors that are important to consider in identifying scientific disciplines. The next section identifies several scientific disciplines that produce knowledge related to the SMIT.

3.2 Research issues related to SMIT

Section 3.1 presented the differences between scientific knowledge and scientific disciplines. This section (3.2) discusses the origin of scientific knowledge related to SMIT. The aim of Section 3.2 is to identify several disciplines, which pursue research related to SMIT.

Section 3.1 introduced the difficulties identifying the boundaries between scientific disciplines and their domain of scientific knowledge. This is because, in many cases, the same research issues are studied by several disciplines, for example, IT is studied within Computer Science and Management Information Science. Different scientific disciplines study the same research issues from different perspectives, but may use different scientific methods to do the research. Consequently, although different disciplines research the same issues their results are also different. The implication of this phenomenon is that the results of the research within different disciplines may have different meanings and applications, depending on the perspective used in the analysis.

In order to identify disciplines related to the research of SMIT, this section uses the definitions presented in Sections 2.1–2.4 as sources of scientific knowledge, and analyzes further the research of Strategy, Management of IT, IT, and IT strategy.

3.2.1 Strategy research

Section 2.1 presented the concept of *strategy* as related to the research of SMIT and introduced several definitions. Therefore, this section analyzes further those definitions in order to identify disciplines that pursue *strategy* research.

Because *strategy* applies to all kind of activities, many disciplines pursue *strategy* research. Therefore, the boundaries in the domain of knowledge related to strategy research within different disciplines, for example, Management Science, and Management Technology, may be difficult to observe.

However, Table 3 shows two characteristics of strategy definitions. The first characteristic is that strategy definitions can be found in different disciplines, for example, *Management Sciences,* and *Management of Information Systems*. The second characteristic is that strategy definitions include the same relevant factors, regardless of the discipline of origin.

3.2.2 Management of information technology

Section 2.2 presented definitions related to the *Management of Information Technology*, this section analyzes further those definitions in order to identify scientific disciplines that do research related to *the management of information technology*.

Since information technology influences many areas, many scientific disciplines study issues related to the *Management of Information Technology,* and therefore much research can be found [53]. Scientific disciplines such as Computer Science, Management Science, Organization Science, Economy, and Management of Information Systems, continuously produce research that may be related to the *Management of Information Technology*.

[53] *See i.e. Ball (1982, p. 30), Brancheau et al. (1987), Clark (1993, p. 62), Dickson et al. (1984, p.138), Kanter (2003, p. 24), Niederman (1991, p. 479).*

However, *Management of Information Technology* is studied by two major disciplines: Information Science[54], and Management of Information Systems (MIS). While the research within the discipline of Information focuses on dissemination of information regardless of the distribution channels, the discipline of Management of Information Systems is interested in the management of information through technology. Therefore, for the purpose of this thesis the discipline of MIS is selected as a parent discipline for aspects related to the management of information technology.

3.2.3 Information Technology (IT) research

Section 2.4 presented the importance of *information technology* (IT) for the research of SMIT, therefore this section analyzes further definitions for identifying scientific disciplines that may pursue research related to *IT*.

Information technology (IT) is also known in prior research as Information Systems (IS), Information Systems and Information Technologies (IS/IT)[55], Information and Communication Technologies (ICT)[56], and Information Systems and Technology (IST)[57].

Since *information technology* (IT) influences many areas, many scientific disciplines study issues related to IT, and therefore much research can be found[58]. Because IT affects many disciplines, research into the management of IT has been conducted since 1960 from several disciplines such as the Management of Information Systems, Economics, Management Organizational Behavior, Computer Science, Decision Science, and

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54 *See i.e. Webber (2003).*

55 *See i.e. Caldeira & Ward (2002).*

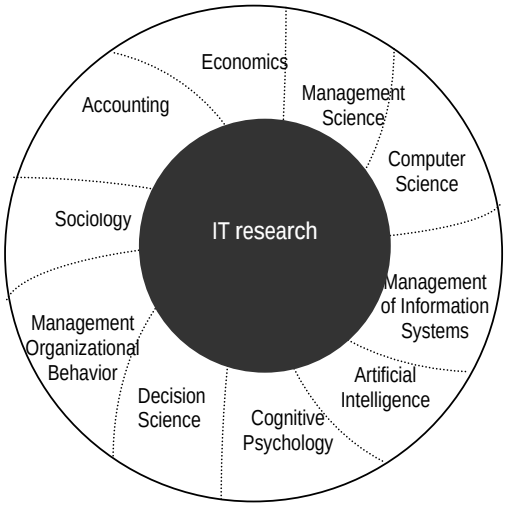
56 *See i.e. Aerts et al. (2004), Economist Intelligence Unit (2004).*

57 *See i.e. Bacon & Fitzgerald (2001).*

58 *See i.e. Ball (1982, p. 30), Brancheau et al. (1987), Dickson et al.(1984, p. 138), Kanter (2003, p.24), Niederman (1991, p. 479).*

Management Science. Consequently, many disciplines today pursue research related to IT. Figure 4 illustrates some disciplines that conduct IT research.

Figure 4: Interdisciplinary nature of IT research



(Source: Developed for this thesis from Section 3.2.3)

Figure 4 illustrates that IT research is pursued within many disciplines, and therefore, may be influenced by many dominant theories within those disciplines. This figure can be compared to the one proposed by Davis (1991, p. 8). While Davis proposes that the discipline of Information Systems shares methods and theories of other disciplines, however in my perception IT research do not have own research theories or methods, but combine theories or methods from other disciplines.

3.2.4 IT strategy research

Section 2.5 discusses the importance of IT strategy for the research of SMIT. This section discusses the disciplines that lead the research of IT strategy.

IT strategy is also known as: Information Systems Strategy (ISS)[59], Strategic Information Systems Planning (SISP)[60], Business Information Systems Strategies (BISS), Information and Communication Strategies (ICT)[61], IS/IT strategies, and IT/IS strategic planning[62]. Even though there are certain differences between the terms, much research uses these terms as synonyms.

IT strategy research has been influenced by other disciplines, such as Management Science[63], Computer Science, and Organization. Developments in the discipline of Computer Science affect *IT strategies*. This is because the development of new technologies affects the results of IT strategies. This is because new technological developments increase the choices of IT, which affect IT strategies. Organization theories also influence IT strategy research with theories such as Group interaction, Knowledge Management, and Organizational Learning[64].

In order to illustrate the relationship between other disciplines and IT strategy research, Figure 5 was developed and included in this section.

59 *See i.e. Salmela & Spil (2002).*

60 *See i.e. Lederer & Salmela (1996), Kearns & Lederer (1999), Te & Ang (1999).*

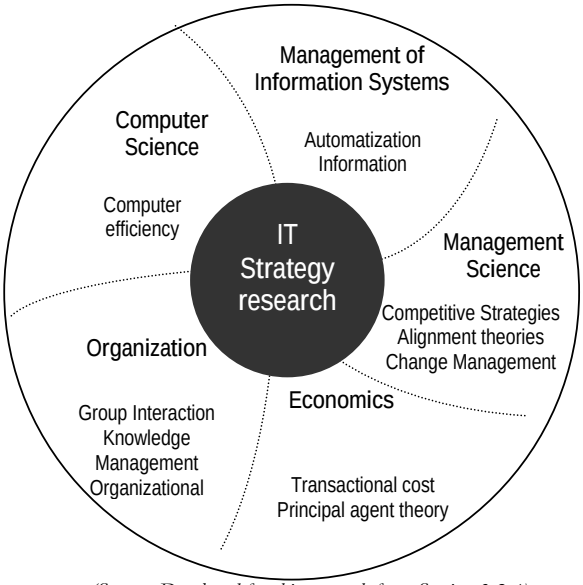
61 *See i.e. Economist Intelligence Unit (2004).*

62 *See i.e. Lee & Bai (2003).*

63 *See i.e. Porter (2001).*

64 *See i.e. Orlikowski (1992a, 1995, 2000).*

Figure 5: Interdisciplinary nature of IT Strategy Research



(Source: Developed for this research from Section 3.2.4)

Figure 5 shows the interdisciplinary nature of IT strategy research, which is influenced by theories from disciplines such as management of information systems, management science, economy, organization, and computer science.

Given an introduction about research issues related to SMIT, next section presents a summary for Section 3.2.1–3.2.4.

3.3 Parent disciplines for research issues related to SMIT

Section 3.2 presented many disciplines, which pursue research related to SMIT. Therefore, the aim of this section is to identify parent disciplines that can be used to understand SMIT in this thesis.

Section 3.2.1–3.2.4, presented research issues related to SMIT, i.e. strategy, IT, and IT strategy. This section starts the analysis of parent disciplines by summarizing these results.

For this purpose Sections 3.2.1–3.2.4 are further analyzed focusing on the disciplines pursuing particular research issues. For instance, Section 3.2.1 indicates that among the disciplines that study *strategy* research one can find Management of Information Systems, and Management Science. The analysis of Section 3.2.2 indicates that among disciplines researching *management of information technology* one can find Computer Science, Economy, Management of Information Systems, Management Science, and Organization Science. The analysis of Section 3.2.3 shows that others disciplines researching *Information Technology* are Computer Science, Decision Science, Economics, Management of Information Systems, Management Science, and Organizational Science. Table 10 shows a summary of these findings.

Table 10: Research Issues and Disciplines

Research issue	Others names	Disciplines related
Strategy (3.2.1)	Business strategies	Management Science, and Management of Information Systems.
Management of Information Technology (3.2.2)	Information Systems (IS), Information Management (IM), and Informatics	Computer Science, Economy, Management of Information Systems, Management Science, and Organization Science.
IT Strategy (3.2.3)	Information Systems Strategy (ISS), Strategic Information Systems Planning (SISP), Business information strategies (BISS), Information and communication strategies (ICT), IS/IT strategies.	Computer Science, Management of Information Systems, Management Science, and Organization Science.

Continues

Continued

Research issue	Others names	Disciplines related
Information Technology (3.2.4)	Information Systems (IS), Information Systems and Information Technologies (IS/IT), Information and Communication Technologies (ICT).	Computer Science, Decision Science, Economics, Management of Information Systems, Management, Management Science, and Organizational Science.

(Source: Developed for this thesis as a summary of Section 3.2)

Table 10 introduced many disciplines that may be related to the research of SMIT. The disciplines presented in Table 10 are further analyzed in combination with the aim (1.3) and the research questions (1.4).

The following sections analyze parent disciplines for the research issues presented in Table 10.

3.3.1 Parent discipline for *Strategy* issues

As shown in Table 10, both Management of Information Systems and Management Science can contribute with *strategy* research. However, considering this, the focus of this research is the process of strategic analysis and its contribution related to strategic management, i.e. framework for strategic analysis, the discipline of Management Science is selected as a parent discipline for strategy issues related to SMIT.

3.3.2 Parent discipline for Management of Information Technology issues

As shown in Table 10, *Management of Information Technology* is studied by several disciplines[65]. However, the research of management issues related to IT is conducted in two major disciplines: Information Science[66], and Management of Information Systems (MIS). While research in the discipline of Information focuses on dissemination of information regardless of distribution channels, the discipline of Management of Information Systems is interested in the management of information through technology. Therefore, for the aim (1.3) and the research questions (1.4) of this thesis the discipline of MIS is selected as a parent discipline for factors related to the management of information technology.

3.3.3 Parent discipline for *IT* issues

As shown in Table 10, many disciplines pursue research related to *IT,* i.e. Computer Science, Economy, Management of Information Systems, Management Science, and Organization Science. However, the research of IT is studied in two major disciplines: the discipline of Computer Science (CS), and the discipline of Management Information Systems (MIS). Davis (1991, p.10) discusses the roots of IT in relation to the *field of computer science*. Davis (ibid) argues that even when the fields of Computer Science, and the field of Management of Information Systems, study the same object (IT), there are differences in the way the disciplines approach IT. The differences are related to the context for the use of knowledge, academic context, key issues, and research paradigms. Table 11 summarizes Davis' propositions.

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65 *For instance. Computer Science, Economy, and Management of Information Systems, Management Science, Organization Science.*

66 *See i.e. Webber S. (2003), Information Science in 2003: a Critique. Journal of Information Science. Vol. 29 Nr. 4, p. 312.*

Table 11: Differences in IT research between the disciplines of MIS and Computer Science

	MIS	Computer Science
Context of use	Organization	Processing problem
Academic context	Study of organizations and management	Study of mathematics and computation
Key issues	Design, implementation, management of human/machine systems	Algorithms, computational methods, and structures for modeling data and programs
Research paradigms	Organizational and behavioral research	Algorithms, proofs, and demonstration of methods.

[Source: Developed for this thesis as a summary of Davis (1991, p. 10)]

3.3.4 Parent discipline for the *IT strategy* issues

As summarized in Table 10, the research of *IT strategy* issues is conducted in several disciplines, i.e. Computer Science, Management of Information Systems, Management Science, and Organization Science. However, the contributions of these disciplines to IT strategy are different. For instance, computer science focuses on factors related to technological efficiency rather than strategy. Organization Science focuses more on organizational impacts than IT. Management Science does not consider IT in enough depth, to provide relevant factors related to the management of IT. Finally, Management of Information Technology is the only discipline that combines both management and IT and therefore can provide relevant issues related to SMIT.

3.4 Parent disciplines for SMIT research

Sections 3.3.1–3.3.4, define the domain of knowledge and the parent disciplines that are most related to research issues related to SMIT. SMIT is related to the research of Strategy, Management of Information Technology,

Information Technology, and IT Strategy. Moreover, these research issues are studied by several disciplines, i.e. Management Science, Computer Science, Decision Science, Economics, Management of Information Systems, Management Science, and Organizational Science.

However for the purpose of this thesis, the perspectives of two disciplines are in focus: *Management Science* (MS) and *Management of Information Systems* (MIS). The discipline of *Management Science* provides knowledge about factors such as strategic management, competitive environment, competitive strategies, and competitive factors. The discipline of the *Management of Information Systems* provides knowledge about factors of IT and IT strategies in competition. Table 12 summarizes the results presented in this section.

Table 12: Parent disciplines for SMIT research

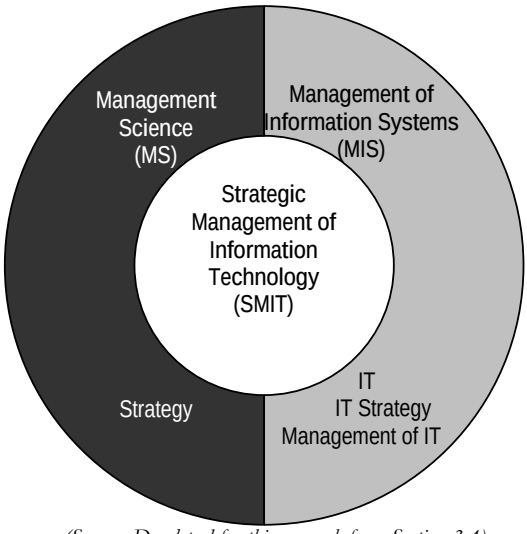
Domain of knowledge	Parent Discipline
Strategy (3.2.1)	Management Science (3.3.1)
Management of Information Technology (3.2.2)	Management of Information Systems (3.3.2)
IT (3.2.3)	Management of Information Systems (3.3.3)
IT Strategy (3.2.4)	Management of Information Systems (3.3.4)

(Source: Developed for this thesis as a summary of Section 3.3)

As shown in Table 12 two disciplines are selected for the research of different factors related to SMIT*:* Management Science, and Management of Information Systems. The discipline of Management Science is selected for the exploration of strategy research. The discipline of Management Information Systems is selected for the exploration of IT, IT strategy, and IT management.

Figure 6, illustrates parent disciplines and research issues for the exploration of SMIT.

Figure 6: Parent disciplines for SMIT research



(Source: Developed for this research from Section 3.4)

Figure 6 shows the parent disciplines considered for the exploration of SMIT in this thesis. The model shows that the exploration of SMIT is possible through the exploration of two parent disciplines; Management Science and Management Information Systems. While the discipline of Management Science can be used to analyze SMIT factors related to strategy, the discipline of Management of Information Systems can be used to analyze factors of SMIT related to IT, IT strategy, and the management of IT. Although, it is possible that other researchers may select other disciplines. This thesis focuses in the analysis of strategy and IT, as is represented in Figure 6.

Summary Chapter 3

Chapter 3 analyzed issues and disciplines related to SMIT research. The chapter started by presenting a discussion of scientific knowledge and scientific disciplines (3.1). The chapter identified research issues related to SMIT and the disciplines that conduct that research (3.2). The research issues considered in the analysis are strategy research (3.2.1), management research (3.2.2), IT

research (3.2.3), and IT strategy research (3.2.4). Finally, this chapter identified two parent disciplines as data sources for the research of SMIT (3.4): the discipline of Management Science (MS), and the discipline of Management Information Systems (MIS). While MS is used to explore factors related to strategy and strategic management, MIS is used to identify factors related to the management of IT, IT, and IT strategy.

Having given MS and MIS as parent disciplines for factors related to SMIT, this thesis continues by evaluating the research of these disciplines in Chapter 4.

Chapter 4:

MS, MIS, AND SMIT RESEARCH

Chapter 3 introduced *Management Science* (MS) and *Management of Information Systems* (MIS) as parent disciplines, and sources of data for the research of SMIT pursued in this thesis. Chapter 4 analyzes the state-of-the-art[67] of MS and MIS in terms of their contributions and gaps to SMIT research and establishes the settings for the research in this thesis.

The chapter starts with Sections 4.1–4.2 that introduce the disciplines of MS and MIS by describing their research, paradigms, and ongoing debates. Section 4.3 analyzes the contributions and gaps of MS and MIS to SMIT research.

Having given a brief introduction to the contents of Chapter 4, the next section continues by introducing the discipline of Management Science.

4.1 The discipline of Management Science (MS)

Section 3.4 presented the discipline of *Management Science (MS)*, as one parent discipline to SMIT research. Therefore, the aim of this section (4.1) is to introduce the discipline of MS and previous research.

[67] *By **state-of-the-art** I mean the highest level of development of the discipline.*

The discipline of Management Science (*MS*) started in 1953[68] with the establishment of The Institute of Management Sciences (*TIMS*)[69]. The discipline of MS is also known as *Decision Science (DS), Operational Research (OR),* and *Success Science (SS)*[70] [71]. MS research is influenced by other disciplines: Accounting and finance, Business strategy, Decision Analysis, Information systems, Manufacturing and distribution, Marketing, Mathematical Programming and Networks, Organization Performance, Public Sector Applications, R&D or Innovation, Stochastic Models and Simulation, Strategy and Design, Supply Chain Management[72]. Although MS research covers many issues, its focus lies on strategic planning[73].

4.1.1 MS research

Many researchers[74] in the discipline of MS are dedicated to the research of strategy. As shown in Table 3, strategy definitions have been proposed since 1965, and have been related to decision-making aimed to achieve goals for the future of a business organization. However, strategy definitions have evolved over time changing the perceptions about strategy from being an activity that can be planned, to being an activity that emerges over time. This evolution implies that MS researchers have changed the assumptions and focus of their analysis regarding strategy research. Therefore, historical strategy research has

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68 *To understand the historical development of Management Science, see Hopp (2004, p. 6).*

69 *See Hopp (2004, p. 1).*

70 *See i.e. Arsham (2005, p. 7).*

71 *Both MS and* OR *focus on the development and application of quantity tools to management, however MS develops scientific frameworks in which these tools are to be used. See Hopp (2004, p. 2).*

72 *See Arsham (2005, p. 7).*

73 *Source: Journal Information for Management Science, Retrieved November 29, 2005, from: http://www.jstor.org/journals/00251909.html.*

74 *See i.e. Ansoff (1965), Chandler (1962), Mintzberg (1998), Porter (1980, 1985, and 1996).*

gone through several paradigms[75]. Since every paradigm produces different knowledge regarding strategy, the evolution of strategy paradigms is included below.

4.1.2 MS paradigms

Several researchers[76] have analyzed the evolution of the strategic paradigm. While Mintzberg (1991) and Whittington (2001) classify strategy theories in relation to the development of strategies, O'Shannassy (1999) reviews the evolution of the strategic paradigms in relation to management. Since management paradigms are more related to SMIT, the results of O'Shannassy (1999) are briefly covered in this section.

O'Shannassy (1999) summarizes the evolution of strategic research in MS in five paradigms: basic financial planning, forecast-based planning, externally oriented planning, strategic management, and strategic thinking paradigm. The first paradigm[77] started in 1950 and involved **basic financial planning**. In this paradigm, the planning focus is related to the financial budget with a time horizon slightly beyond 12 months. Some of the researchers that can be included within this paradigm are Drucker (1954), and Selznic (1957). The second paradigm started in 1960 and involved **forecast-based planning**, meaning that organizations started to embrace a longer time horizon, environmental analysis, multiyear forecasting and static factor allocation. Researchers that belong to this paradigm are Chandler (1962), Ansoff (1965), Andrews[78] (1980). The third paradigm started in 1970 and involved **externally oriented planning**, meaning that strategic planning includes situation analysis, a review of competition, and an evaluation of alternative strategies and

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75 *Paradigm refers to changes in research assumptions and focus on a specific research issue within a discipline.*

76 *See i.e. Mintzberg (1991, 1998), O'Shannassy (1999), Whittington (2001).*

77 *See O'Shannassy (1999, p. 2).*

78 *Andrews's contribution is represented by the SWOT analysis (Strengths Weaknesses Opportunities and Threats) that has enormous influence on strategy research.*

dynamic factor allocation. This paradigm produced many frameworks such as the Experience Curve, the Boston Consulting Group's (BCG) portfolio matrix, and the Profit Impact of Marketing Strategies (PIMS) empirical project[79]. The fourth paradigm started in 1980 and involved **strategic management**, the combination of a business organization's factors to achieve competitive advantages. This paradigm includes three factors: a planning framework, a planning process and corporate visions and values. Important contributions to this phase include contributions from other disciplines. For example Porter (1980, 1985, 1990) contributed with the integrated the structure – conduct – performance theory in industrial – organization economics. He also created frameworks such as five forces, the value chain, and the diamond model of competitive advantages. Another contribution grounded in field economics are the contributions of Wernerfelt (1984), Barney (1991), and Peteraf (1993). The fifth paradigm started in the mid-1980s and involved **strategic thinking**. IT initiates the process of developing new strategic solutions that are not included in existent strategic frameworks. Contributors to this phase are Ohmae (1982), Stacey (1993), and Cummings (2003). Table 13, summarizes the paradigms proposed by O'Shannassy (1999).

Table 13: Paradigms in Strategy Research

Paradigm	First	Second	Third	Fourth	Fifth
Focus	Basic financial planning	Forecasting planning	Externally oriented	Strategic Management	Strategic Thinking
Authors	Drucker, 1954; Selznic, 1957	Chandler, 1962; Andrews,1965; Ansoff, 1965	Boston Consulting Group's (BCG)	Wernerfelt,1984; Barney,1991; Peteraf, 1993	Ohmae,1982; Stacey, 1993.

(Source: Developed for this thesis as a summary of O'Shannassy, 1999)

[79] *See O'Shannassy (1999, pp. 5–7).*

4.1.3 MS ongoing debates

There are several debates in strategy research. Examples of ongoing debates in MS in relation to strategy research are the nature of strategy as a plan or patterns, as science or art, and as static or dynamic. The *nature of strategy* is a source of debate between researchers. Table 13 summarizes existing paradigms regarding the nature of strategy. One example of this type of debate is the discussion about strategy in terms of *goals,* or *patterns* of decisions. Mintzberg (1994) has discussed strategy in terms of patterns. Strategy as *patterns* implies that strategy is not a straight action but an emergent sequence of actions. Moreover, the execution of patterns of decisions in large companies may become a complex action. This is because, in large organizations, the application of patterns of decision is done by virtue of the cooperation of many managers. Therefore, managers need to communicate their strategies to create consensus. However, obtaining consensus is difficult, because each manager may have several strategic choices, and the strategies may be different. Consequently, many researchers believe that communication is one of the most important actions in strategic management. The opposite of this debate is the strategy in terms of *plans*, which means that strategy can be planned in advance to achieve specific goals. An example of a researcher that defends this position is Porter and Ansoff.

One of the debates is about strategy in terms of *science or art*. While some researchers [80] argue that strategy should be considered as an art, others researchers[81] argue that strategy is a science.

Another debate is about the *static and dynamic* factors of strategy. This discussion started with Mintzberg (1990), who argued that strategy is procedural, and criticizes the planning school which limits strategic

[80] *See i.e. Ohmae (1982), Mintzberg (1994), and Cummings (2003).*

[81] *See i.e. Porter (1985), Andrews (1965), Ansoff (1965).*

implementation by excluding the intervention of middle management which produces resistance, but also because it is not useful in dynamic environments.

4.2 The discipline of Management Information Systems (MIS)

Section 3.4 introduced the discipline of *Management Information Systems (*MIS*)*, as a parent discipline to *information technology* research. The aim of this section is to introduce MIS as a discipline, and its research and contributions to SMIT.

The discipline of *Management Information Systems*[82] started in the 1960s with a few researchers [83] that understood its importance[84]. The discipline of MIS is also known as *Information Systems (IS)*, *Information Management (IM),* and *Informatics*[85]. Figure 7 illustrates the different terms used for this discipline since, in the academic world, the MIS discipline is known under different names[86].

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82 *See Davis (1991, 2001) for critical events in the development of Management Information Systems as a discipline.*

83 *Davis (2003, pp.282-284) presents a list of researchers who are considered as the grounders of the MIS research field. Some of the researchers in the list are: J. Daniel Couger from the US(LEO) , Börje Langefors from Sweden (LEO), Enid Mumford from the UK (LEO), Jay F. Nunamaker Jr. from the US (LEO)., Niels Bjørn-Andersen from Denmark (AIS Fellow), Pentti Kerola from Finland (AIS Fellow), William King from the US (AIS Fellow), Ephraim McLean from the US (AIS Fellow), and Richard O. Mason from the US (LEO).*

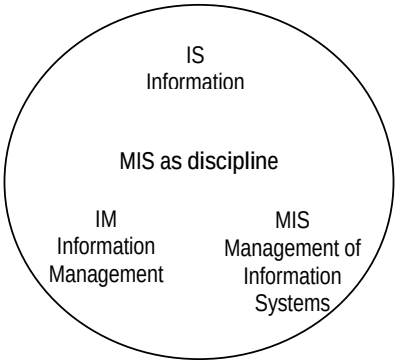
LEO the world's first business computer, developed in the UK in 1951 (Davis, 2003, p.278) AIS Association for Information Systems.

84 *See Nolan & Wetherbe (1980).*

85 *See Davis (1991, p.12), Davis (2003, p. 273).*

86 *See Lundeberg et al. (1995, p. 195).*

Figure 7: The discipline of Management Information Systems



(Source: Developed for this thesis from Section 4.2)

Having given an introduction to the discipline of MIS, the next section introduces MIS research

4.2.1 MIS research

Section 3.3 selected MIS as a parent discipline for IT and IT strategy research. Therefore, the next sections includes thoughts about MIS research in relation to IT and IT strategy.

MIS research started in 1960's by a few researchers[87] that understood the importance of IT[88]. Although MIS research has been a top issue during more than 40 years, researchers[89] still discuss the development of MIS as discipline.

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87 *See Davis (2003, pp. 282-284) to see a list of researchers who he considered as the grounders of MIS research. Some of the researchers mentioned in Davis list are: Daniel Couger (US), Börje Langefors (Sweden), Enid Mumford (UK), Nunamaker Jr. (US), Niels-Björn Andersen (Denmark), Penti Kerola (Findland), William King (US), Ephraim McLean (US), and Richard Mason (US).*

88 *See Nolan (1980).*

89 *See the discussions of Orlikowski and Iacono (2001) that considered the research of MIS is still immature.*

IT Research

Until now, existing IT research has focused on technical strengths of using IT in competition. Consequently, much research focuses on IT's ability to enable competitive advantages, a factor which has few uses in practical competitive situations. This is a problem for several reasons. The first reason is that IT as a technology is available to anyone; therefore, it increases competence about market shares. This is because IT changes the way in which industries compete with each other. In addition, IT increases the pace of competition. This is because IT factors are available to every company, thus competitive advantages of to IT technology drive competitors' responses, a factor that increases competition. IT stimulates the effects of competitive advantages, making business much more complex due to increased decentralization, flexibility, and relations between companies. The second reason is that while some companies invest in IT and get competitive advantages, others need to increase IT investments to survive in the industry[90]. Therefore, it is necessary to consider weaknesses and external factors in relation to IT in order to understand the strategic management of information technology. Moreover, little research has been found that describes either the relations between IT and its environment, or external factors.

IT strategy research

In the MIS discipline, there are many authors [91] that lead the research related to IT strategy. Much IT research has been influenced by strategy theories and organizational theories. Strategy theories have influenced the research of Henderson & Venkatraman (1999), Sabherwal & Chan (2001), and Clarke (2001). Organization perspectives have influenced the research of Bhabuta (1988), Earl (1989), Galliers et al. (1991), Lee & Bai (2003), Nolan

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[90] *IT investments for competitive survival are made as a competitive response and do not enable competitive advantages. See Willcocks et al. (2002, p. 118).*

[91] *See i.e. Besaou (1998), Earl (1989, 1992, 1993, 1994, 1999, 2000, 2001,2003), Henderson & Venkatraman (1999), Chan (1999), Sabherwal et al. (2001).*

(1973), and Rapp W. (2002). Organization theories such as *'Stages of growth'* have influenced the work of Nolan (1973) and Rapp W. (2002) to include the maturity of an organization in IT strategy.

Explanatory models, frameworks, and approaches represent much IT research[92]. Models, frameworks, and approaches are used in two ways. One way is to identify important factors for IT strategies[93]. The other way is to position the direction of IT strategy, i.e. McFarlan (1984).

Some researchers [94] focus on IT Strategy in terms of *models*[95]. Sometimes models are extreme simplifications of IT strategy mostly represented in the form of a 2x2 grid, i.e. McFarlan, 1984. IT strategy models are used to position a business organization in the model and help managers make strategic decisions.

Many researchers [96] focus on *IT strategy in terms of strategic approaches.* IT strategic approaches represent a set of specific assumptions that can be related to a particular theory, i.e. IT strategies that focus on organization theories are said to follow an organizational approach. The research of *IT strategy in terms of approaches* has been influenced by developments in other research disciplines such as Organization, Computer Sciences, and Management Sciences. Each

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92 *See i.e. Anthony (1965), Ciborra (1994), Earl (1989, 1999), Henderson & Venkatraman (1999), Lee & Bai (2003); McFarlan (1984), Sabherwal & Chan (2001), Ward et al. (1990).*

93 *See i.e. Henderson & Venkatraman 1999; Sabherwal & Chan 2001*

94 *See i.e. Henderson & Venkatraman (1999), Nolan (1973), McFarlan (1984), Sabherwal & Chan (2001).*

95 *Some examples of IT strategy models can be seen in::*

Nolan (1973, p.401): Four stages model, McFarlan (1984): Strategic Grid, Henderson & Venkatraman (1999): Strategic alignment, Sabherwal & Chan (2001): Prospectors, analyzers, and defenders alignment.

96 *See i.e. Anthony (1965), Ciborra, (1994), Earl, (1989, 1999), Lee & Bai (2003), Ward et al. (1990).*

discipline influences IT strategy research with particular theories, which result in new IT strategy approaches[97].

Other researchers[98] focus on *IT Strategy as Frameworks*. IT strategies as frameworks are useful to support management in actions such as communication and decision-making. However, most frameworks are based on static assumptions and do not consider the development of IT over time.

To sum up, IT strategy is represented by models, approaches, and frameworks. While models consider few variables, frameworks consider several variables and approaches propose a set of guidelines. In order to use these representations, they have to reflect the position of an organization. However, these representations consider partial factors related to IT. Moreover, they differ in focus and scope, which makes difficult the integration and application of IT strategy knowledge into practical problems. Additionally, those models focus only on the strengths of IT in enabling competitive advantages and do not consider the weakness and impact of IT on competition.

4.2.2 MIS paradigms

The discipline of MIS is a relatively new field[99] that does not have fixed paradigms, but has research questions with cross-traditional boundaries[100].

According to Davis (ibid), the discipline of Information Systems shares methods and interests with several academic disciplines such as Computer Science, Sociology, Psychology, Human Factors Decision Science, Management Organizational Behavior, Sociology, Accounting, and

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97 *Approach is interpreted here as the set of assumptions and intentions behind the strategy.*

98 *See i.e. Clarke (2001), Henderson & Venkatraman (1999).*

99 *To see critical events in the development of the discipline see Appendix A, but also Davis (1991, 2003).*

100 *See Davis (1991, p.6).*

Economics[101]. Consequently, previous research in MIS borrows theories from different disciplines. Some examples of theories that have influenced the development of the field are information theory, systems theory, and change theory[102].

Nilsson (1995) has researched the evolution of research paradigms in the MIS discipline. Nilsson identifies six paradigms in IT research. The first paradigm, the *Systems view,* was developed in the mid 1960s. This paradigm focuses on IT as a system with components that accomplished tasks in a natural and logical order (i.e. top-down and bottom-up). The second paradigm, the *Socio-technical view,* was developed in the early 1970s, and focuses on the interaction between people and computers. This paradigm has been influenced by organization and psychology theories. The third paradigm, *the political view,* was developed in the mid 1970s and focuses on IT as a force that participates in a change process. The fourth paradigm, *the actor-based view,* was developed in the early 1980s and focuses on persons or individuals as the focus for IT work. The fifth paradigm, the *network approach,* was developed in the mid 1980s and focuses on the relationships between actors' networks which other actors' networks. The sixth paradigm, the *multilevel approach,* focuses on IT in terms of levels such as, logical levels, i.e. persons, business infrastructure, information operations and environment, structural levels, i.e. information infrastructure, and other levels. Table 14 summarizes Nilsson's results.

101 *See Davis (1991, p.7).*

102 *See Lundeberg et al.(1995, p. 196).*

Table 14: Paradigms in MIS Research

Paradigm	First	Second	Third	Fourth	Fifth	Sixth
Focus	Systems view	Socio-technical view	Political view	Actor-based view	Network approach	Multilevel approach
Characteristics	IT as a system	IT as interaction between people and computers	IT as a change force	IT as dependent on individual's work	IT as relations between actors' networks	IT as interaction between persons, business infrastructure, information operations and environment.

[Source: Developed for this thesis as a summary of Nilsson (1995, pp. 270–273)]

4.2.3 MIS ongoing debates

After more than 40 years, in 2005, researchers in information technology still appear to have different opinions about the development of this discipline. Among MIS research ongoing debates it was found the maturity of the discipline, and the strategic value of IT.

Regarding the *maturity of MIS* as a discipline, some authors[103] still consider the research of the MIS discipline as immature, while others[104] seem to believe that the research field has developed steadily and become more established.

Regarding the *strategic value of IT*, although many researchers[105] agree that IT is a key factor for competitive advantages; its strategic value has been a source

[103] *See i.e. Orlikowski & Iacono (2001).*

[104] *See i.e. Davis (1991, 2003).*

[105] *See i.e. Earl (1989), Rapp W. (2002).*

of discussion in IT research. Some researchers[106] argue for the strategic value of IT. A few researchers, i.e. Carr 2003, argue against the strategic value of IT, considering IT as a necessity. Other researchers[107] consider that IT may have different strategic values. The discussion trends found among researchers are: (1) researchers[108] that *accept the strategic value of IT*, (2) researchers[109] that *do not see the strategic value of IT*, and thus consider IT as a necessity, and (3) researchers[110] that maintain that *IT has different values depending on its use*. These researchers validate the perceptions of both groups presented above.

Researchers who believe in the strategic value of information technology[108]

These researchers argue that IT has a strategic value because it may enable competitive advantages. These researchers agree that the acquisition of IT in itself is a resource, and believe that IT can become a strategic factor. To become a strategic factor IT has to satisfy two conditions. One condition is that IT is used to enable competitive advantages both to satisfy business needs, and to derive strategic benefits, for example creating new business opportunities or enhancing a business organization's position on the market[111]. Another condition is that IT has to support and be in alignment with business strategies and the mission of the organization[112].

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106 *See i.e. Earl 1989, Porter (1999, 2001).*

107 *See i.e. Capodagli (2001, p. 28), Rapp W. (2002), Willcocks et al. (2002, pp. 45-46).*

108 *See i.e. Applegate, et al. (1996), Earl (1989, 1999); Henderson, & Venkatraman (1999), Porter (1999; 2001), Raghunathan et al. (1999), Rapp W. (2002), Sabherwal & Chan (2001).*

109 *See i.e. Carr (2003).*

110 *See i.e. Capodagli (2001, p. 28), Rapp W. (2002), Willcocks et al. (2002, pp. 45–46).*

111 *See i.e. Applegate et al. (1996), Earl (1999), Porter & Miller (1985), Raghunathan et al. (1999), Rapp W. (2002), Sabherwal & Chan (2001).*

112 *See i.e. (Applegate, et al. 1996; Earl 1999; Henderson & Venkatraman, 1993, Raghunathan, et al. 1999; Rapp, W. 2002).*

Researchers who do not see the strategic value[109]

These researchers maintain that IT changes the nature of industries and obligates companies to use IT in order to survive on the market. Therefore, IT is considered as a necessity and not as a strategic factor, i.e. Carr, 2003. Consequently, the strategic value of IT does not reach beyond the acquisition. However, researchers in this paradigm overlook the processes, the interactions and new possibilities or additional benefits that generate added value.

Researchers who identify different values levels for IT [110]

These researchers validate the claims of both groups by presenting integrating models that explain the context in relations to both cases[113]. In these groups, the researchers make a difference between the roles of IT, and the fact that IT itself does not delivery any strategic value.

However, most researchers agree that the mere acquisition or use of IT factors is not enough to be considered as strategic. The acquisition of IT only means that it is used as a utility or necessity without any additional benefit, i.e. Earl 1989, Rapp W. 2002.

4.3 SMIT research

This section analyzes the contributions and gaps of MS and MIS disciplines in relation to SMIT.

4.3.1 MS research and SMIT

The strategy research produced in the discipline of Management Science influences SMIT with theories for competitive advantage, i.e. economies of scale, sustainable competitive advantage, resource based view (RBV), dynamic capabilities, and innovation. Competitive advantage theories, influences the

[113] *See i.e. Capodagli (2001 p. 28), Rapp, W. (2002), Willcocks et al. (2002, pp. 45-46).*

research of IT strategies. Many IT strategy models directly mirror theories for competitive advantages. For example, the research of Porter (1985a, pp. 33–61), and the research of Miles & Snow (1978) has influenced much IT strategy research, i.e. Henderson & Venkatraman (1993); Sabherwal & Chan (2001). MS influences the research of SMIT with other theories, such as alignment, change management, as well as economic theories, such as transaction costs and principal agent theory.

4.3.2 MIS research and SMIT

Section 1.2 argues that MIS research has focused on technological factors of IT that may enhance competitive advantages. However, much MIS research excludes the relationship between environment and IT. From a strategic management perspective, competitive advantages gained by virtue of technological factors are not sustainable [114]. Moreover, competitors may respond with the implementation of newer technologies, which affects competition. Additionally, with constant changes and improvements in IT, the competitive benefits obtained from the technology may be soon be lost. Therefore, there is a need to understand the effects of IT in the competitive context.

4.3.3 Gaps in MS and MIS research in relation to SMIT

Gaps in MS research

A major gap in MS research in relation to SMIT is that MS research does not consider IT in its research analysis. Although much MS research recognizes IT as a source of competitive advantages, little MS research considers IT in their research analysis. One reason for this pattern may be that Business strategy as a theoretical field is relatively fragmented and has not been particularly interested in IT (Porter, 1991). Consequently, MS research attempts to conceptualize IT by the use of paradoxes, i.e. the first mover

[114] *This is because these strategies are easily imitable, since the technology is available to anyone.*

paradox that is related to the effects of investments in new technologies. The aim of paradoxes in theory building is to justify the complexity of a phenomenon.

MS research has difficulties explaining the relationship between economic benefits and IT investments. However, this problem seems to be accepted by the research community as inexplicable since it has been categorized as a paradox.

One paradox is the *productivity paradox* developed by Solow (1987). According to this paradox, it is difficult to identify productivity achievements produced by the use of Information Technology. The paradox addresses the problem of quantifying the value of IT in a way that can be accounted for with productivity measures. The difficulty of quantifying the value of IT has resulted in the omission of IT from productivity calculations.

Another paradox is the *first mover paradox*. The first mover paradox explains the phenomenon when a company wants to use the latest technology, and invests in new technology before its competitors, and consequently pays relatively high prices. However, within a short time, IT prices usually decline, and competitors may acquire better technology at lower costs, making them more competitive. This is because the technological advantages of the first mover disappear as soon as its competitors acquire better technology. In practice, one company adopts the role of the first mover by implementing new IT to its business activities and eventually gains competitive advantages. Since the technology is available to everyone, other companies within the same industry tend to follow the IT strategy of the first mover. Competitors that imitate the IT strategy of first movers, usually get better technology at a lower price. Nevertheless, as IT strategy is context related, there are no guarantees that an imitated strategy will give any positive results for the imitating company. One argument for the limitation of the first mover's paradox is that the first mover may have to obtain skills in the technology that may be used and exploited to enhance competitive advantages. Moreover, since new technology is available to any business organization, the achievement of

competitive advantages depends mostly on the effectiveness of IT management.

Gaps in MIS research

In the analysis of IT research produced by MIS as a discipline, several gaps in the scope of the research were found in relation to SMIT. Thus, the aim of this section is to discuss these gaps in MIS research explaining the *strategic management of information technology.*

IT has been at the centre of human experience during the past 40 years. However, it is still difficult to predict the effect of new technologies practically (Cardullo, 1996, p. 1). One of the main problems related to the management of IT is based on the ambiguity involved with the factor. This is because the speed of IT development is higher than managers' potential to implement new IT strategies.

One major gap in MIS research is that IT has not been fully understood within the discipline[115]. Mason & Mitroff [116](1973) argue that this is because researchers have not analyzed the meaning of IT in enough detail, and traditionally analyze IT in relation to single factors. In contrast, Orlikowski & Iacono (2001, p. 121) claim that:

> *… these articles [related to IT research] essentially treat technology as absent, referring to it in passing as the context, motivation, or background against which to set examinations of phenomena such as IT governance mechanisms, IS professionalism, and IS strategy or planning approaches. In many of these articles, we notice that we could have substituted another term for IS [IT] – for example, "HR" personnel, "logistics," outsourcing, or "marketing" strategy – and the articles would still have made sense.*

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115 *See i.e. Mason & Mitroff (1973),Orlikowski & Iacono (2001, p. 121).*

116 *Mason and Mitroff, suggest in their paper that, IT research should be done by considering an analysis of different dimensions, emphasizing that the nature of the dimensions selected is not as important as the analysis behind the dimensions.*

(Source: Orlikowski & Iacono, 2001, p. 121)

The observations of Orlikowski & Iacono (2001, p.121), have several implications: the discipline of management of information systems consider IT as an isolated *black box* that is not related to any context, and (2) that the relation between IT and IT strategy is still unexplored in terms of the implications of IT for management. Therefore, an understanding of IT as an artifact, and its effects on competition would increase the understanding of SMIT. Therefore, the term IT has been accepted without further analysis.[117] Although, the meanings and the scope[118] of IT have changed with new IT developments, many researchers accept IT as a common phenomenon; and do not explain its meaning[117].

The gaps found in IT strategy research are related to several factors: ambiguous use of terms, lack of specification about the type of IT included in IT strategies, IT strategies that do not keep pace with the IT developments.

The *ambiguous use of terms* in MIS research is a well-known pattern in IT research. A major example is that much research refers to *Information systems strategies* and *information technology strategies* as the same phenomenon. While sometimes both expressions have the same meaning, in other research they refer to different strategies.

Additionally, IT strategy research does not explain the assumptions about the *technology* for which those strategies may apply. Most researchers, i.e. Earl, (1989), Henderson & Venkatraman (1993) do not mention technology in their IT strategies and few researchers have been found that consider the technology, i.e. Hedman & Kalling (2002), Rapp, W. (2002).

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117 *See i.e. Masons et al. (1973), Orlikowski & Iacono (2001, p. 1).*

118 *Luftman, et al. (2004: 333) explain this phenomenon, "IT is well-known for having many acronyms, special terms, special meanings for common terms, and even different definitions for common terms."*.

Moreover, the models, frameworks and approaches for IT strategies do not keep pace with the development of new IT technologies. Instead, researchers, i.e. Earl (1989) and Henderson & Venkatraman (1993), present generic factors for strategic analysis. One reason for this is the difficulty in predicting the future development of IT.

One of the gaps found in IT strategy research in relation to its ability to explain SMIT was the difficulty of MIS research to explain the relation between IT Investment vs. Economic Benefits. In recent decades, the total amount of investments in IT has increased [119] [120] [121]. However, many investments have not led to competitive advantages or economic benefits. Earl (1992, p. 106) explains in detailed the reasons for this phenomenon in the following statement:

> *The generic problem is that the functional characteristics of IT: specialist knowledge, professional leadership, career development are valid but the pay off of IT is in the business, whether in business units or other functions. The functional characteristics are concerned with efficiency and standards. Only business can delivery the effectiveness and benefits.*
>
> *(Source: Earl, 1992, p. 106)*

Following the observations of Earl (1992), one can conclude that it is difficult for IT to pay off, outside a business context. This is because the

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[119] *As an example the ICT investment in OECD countries rose from less than 15% of the total non/residential investment in the early 1980s, to between 15% and 30% in 2001 (OECD, 2004:9). ICT's share of the total non-residential investment doubled and in some cases even quadrupled between 1980 and 2000. OECD short for Organization for Economic Co-operation and Development. OECD countries: are: Australia, Austria, Belgium, Canada, the Czech Republic (1995), Denmark, Finland, France, Germany, Greece, Hungary (1996), Iceland, Italy, Japan, Korea (1996), Luxemburg, Mexico (1994), the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic (2000), Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. (Source: OECD, 2004, p.2).*

[120] *In 2001/2002, ICT's share was particularly high in Sweden, the United Kingdom and the United States (OECD, 2005, p.126).*

[121] *EU sank nearly €1.9 trillion into ICT capital in 1995-2001, an average rate of over 19% per year. (Economist Intelligence Unit, 2004, p.7).*

business is the one that makes the profits within the business organization. Therefore, the management of IT must subordinate its goals to achieve strategic business goals in order to produce economic benefits.

There may be several reasons for the existence of these gaps in explaining SMIT. One reason may be that much MS and MIS research assumes that the implementation of information technology as technology is a sufficient condition to achieve competitive advantages. However, as shown in the research problem (See Section 1.2) this has not been the case. Another cause may be that MS or MIS research rarely analyzes IT within its competitive environment and has therefore difficulties explaining the relations between IT and competitive advantages. Moreover, most research in MS and MIS assume that both IT, and the environment are stable and without any change. The assumption that IT is static produces several effects on competition: first, a lack of understanding about the impact of new IT developments in the competitive environment, and second, IT strategies based mainly on technology soon become outdated. Additionally, changes in the competitive environment can enhance the impact of IT developments, in ways that are not possible to foresee.

Today after 40 years of research, many IT strategy frameworks[122] have been created over time. However, these IT strategy frameworks are different in their assumptions and are difficult to combine. The limitations of existing frameworks for management IT suggest the need for more comprehensive frameworks or models of research[123].

The frameworks in both disciplines MS and MIS, only consider static competitive factors of IT. This is a problem because in the past decade, competition has increased its pace and become dynamic. One example is that

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122 *See i.e. Anthony (1965), Ciborra (1994), Earl (1989, 1999), Henderson & Venkatraman (1999), Lee & Bai (2003), McFarlan (1984), Sabherwal & Chan (2001), Ward et al. (1990).*

123 *See i.e. Ives et al. (1980, p. 1).*

the competitive environment has been changing and may be considered as dynamic. Another example is that continuous developments in information technology increase the pace of competition.

Summary of the Gaps

Table 15 summarizes the gaps found in MS and MIS research in relation to SMIT.

Table 15: Gaps in MS and MIS research in relation to SMIT

Discipline	Gaps in the Research	Researchers
Management Science (MS)	Difficulty in measuring the bottom-line contribution of IT investments – the IT productivity paradox	Strassman (1985), Brynjolfsson (1993).
	MS research as a theoretical field and its strategy research has not been particularly interested in IT	Porter (1991).
Management Information Systems (MIS)	Lack of understanding about IT in relation to its context	Mason & Mitroff (1973), Orlikowski & Iacono (2001, p. 121)
	Research that relates IT to strategy theories is lacking	Sambamurthy (2000)
	It is difficult to integrate IT research	Callon (1996), Kirchmer (1998).

(Source: Summarized from Sections 4.3.1–4.3.2)

Having given the gaps found in MS and MIS research related to SMIT, this chapter continues with a summary about its contents.

Summary Chapter 4

This chapter has evaluated MS and MIS research in relation to their contributions to SMIT.

MS (4.1) and MIS (4.2) research has been evaluated in terms of contribution to SMIT. While the discipline of MS focuses on strategy and strategic

management research, the discipline of MIS focuses on IT and IT research. The state-of-the-art of SMIT research was summarized in Section 4.3. Several gaps were found in the contribution to SMIT and were summarized in (4.3.3).

Chapter 4 has analyzed MS and MIS research in relation to SMIT. The content of this chapter is a starting point in the analysis of the data sources found in both disciplines. The data of both disciplines is analyzed in a way that contributes to reduce these gaps.

Chapter 5:

RESEARCH METHODOLOGY

Chapter 4 identified gaps in prior research related to SMIT. Therefore, the aim of this chapter is to describe the process followed to find answers to the research questions proposed in this thesis.

Chapter 5 includes several sections, which cover factors such as justification (5.1), research design (5.2), analysis and results (5.3), contribution (5.4), validity (5.5), and research biases (5.6).

5.1 Justification

Section 1.5 introduced the methodology used for this research as qualitative. The aim of this section is to justify the selection of qualitative research for the development of the analysis made in this thesis. The justification of the methodology is presented in Sections 5.1.1–5.1.2. Section 5.1.1, justifies the methodology selected for the research, and Section 5.1.2 justifies the method selected for data collection.

5.1.1 Choice of methodology

There are traditionally two methodologies for research, i.e. *qualitative* and *quantitative*. Although, both methodologies may be used to find answers for the questions proposed in this thesis, only one methodology was chosen for this research (1.7). The next section describes some differences between qualitative and quantitative research.

Some differences between qualitative and quantitative research methodologies can be found in Patton (1990). Patton [124] analyzes both methodologies considering their difference in relation to factors such as *scope, generalizability, and validity*. In the analysis of *scope*, he finds that qualitative methods permit the study of selected issues in depth and detail, while quantitative methods permit the study of many issues at once, and therefore requires the design of standard instruments for collecting data. In the analysis of *generalizability* he finds that qualitative methods are used to understand selected cases, which reduce the generalizability of results. The quantitative approach in contrast summarizes by statistical aggregation a broad amount of data to a limited set of answers, which facilitates the generalizability of results. In the analysis of *validity* he finds that the validity of the results in qualitative research relies on the skills, competence, and rigor of the person doing the fieldwork. In quantitative research, the validity depends on the construction and application of the instruments used to collect data[125]. Moreover, qualitative research rests on description, narrative, argument and persuasion, unlike quantitative research with its reliance on statistical and technical instruments[126]. Table 16 summarizes Patton (1990) results.

Table 16: Differences between Qualitative and Quantitative Research Methods

	Qualitative Research	Quantitative Research
Scope	Studies selected issues or cases in depth and detail	Studies many issues at once
Generalizability	Limited generalizability	Generalizability based on statistical analysis

Continues

[124] *See Patton (1990, pp.13-14).*

[125] *See Patton (1990, p.14)*

[126] *See Aktinson (1991 as cited in Woods, 1999, p. 2).*

Continued

	Qualitative Research	Quantitative Research
Validity	Relies on the skills, competence, and rigor of the person doing the fieldwork	Relies on the construction and application of the instruments used to collect data

[Source: Summarized from Patton (1990, pp.13-14)]

Table 16 summarizes some differences in qualitative and quantitative research methods in factors such as scope, generalizability, and validity. The selection of an appropriate method should therefore be adjusted to the type of research that is to be followed. In order to select the most appropriate methodology for this research, the next section reviews the aim and focus of this thesis.

Considering the aim is the development of a framework to explore the *strategic management of information technology (SMIT)*, and the focus of analysis is strategic management, the contributions of this thesis belong to the discipline of Management Science (MS). Consequently, an appropriate methodology for this thesis may be representative for research methods used in the discipline of MS. Although MS research may use both qualitative and quantitative research methods, much MS research is qualitative. This is because much MS research uses argument and persuasion as a way to present results.

SMIT research in this thesis includes three processes. First, a preliminary understanding of research related to strategic management and information technology. Second, this thesis is about understanding unexplored factors that are later integrated into a framework. The results of this thesis are presented by using arguments that construct meanings between SMIT factors IT. Consequently, a qualitative methodology can be used in this research for several reasons. One reason is that qualitative research is helpful when finding answers for unexplored issues, which may be of benefit when looking for unexplored factors related to SMIT. Another reason is that qualitative research is helpful in constructing arguments that explain factors related to SMIT. An

additional reason is that qualitative research is useful when communicating arguments related to strategic analysis. Considering the reasons given above and the fact that qualitative research is also representative for research in the MS discipline, I have selected this method for the research in this thesis. Having given some reasons for the selection of a qualitative methodology for this research, the next section introduces some reasons for the selection of a method for data collection.

5.1.2 Choice of data collection method

Section 5.1.1 introduced some reasons for the selection of qualitative research as the methodology for this thesis. This section analyzes and evaluates methods for data collection representative of qualitative research.

Data in qualitative research is usually related to words, and words may be based on *observation, interviews, or documents* (Miles & Huberman, 1994, p. 9). Therefore, either an empirical[127] or a theoretical method can be used to collect qualitative data. However, while empirical methods collect data from individuals' prior experiences in business organizations and industries, theoretical methods collect existent data from documents, scientific theories, and scientific disciplines. Considering the aim of this thesis is to explore SMIT this section analyzes empirical and theoretical data in relation to this aim.

After analyzing uses of empirical data for SMIT research several disadvantages were found. One disadvantage of using empirical data was that it could be difficult to identify and select individuals with skills, knowledge, and experience that can contribute to expand the knowledge about SMIT. Another disadvantage is that data collected in interviews is dependent on personal skills and experience and is difficult to validate from others individuals. Moreover, since the idea is to construct a new understanding of SMIT, it can be difficult to obtain relevant empiric data that can be used to explain SMIT that until now

[127] *"Empirical, refers to demonstrated evidence rather than purely theoretical speculations or explanations based on faith" (Moriarty, 1997, p. 4).*

has been partially understood. Another consideration is that since empirical data depends on individuals' experiences, there are no guarantees that relevant factors for building a SMIT framework can be gathered through interviews. Consequently, being SMIT an unexplored phenomenon, the use of empirical data in this research, difficulty the validation of the data collected.

In contrast, the use of theoretical data seems to provide some advantages. One advantage of using theoretical data is that it makes possible the identification of relevant data in relation to SMIT. One reason for this is that I as a researcher can carefully select relevant theoretical sources, which provide the most reliable data for the phenomenon SMIT. Until now there is much theoretical data that investigates SM and IT as separate units, therefore the selection of relevant data related to SMIT is easier when using theoretical data sources. Moreover, the validation of answers using theoretical data is easy to achieve, since I can validate data by comparing it with the results of other researchers and disciplines. Considering that empirical data does not provide any advantages for the aim and purpose of this research, and that there are plenty of advantages of using theoretical data, this thesis uses theoretical data as data sources.

5.1.3 Analysis method

The analysis made in qualitative research seeks to generate theory [128] from data. Moreover, a qualitative research approach requires the application of a critical realism/interpretative approach analyzing the data. This is because qualitative research requires critical thinking in order to evaluate data and identify relevant results.

The phenomenon to be analyzed is SMIT and the focus of the analysis is on strategic management and IT. The analysis is based on the perspectives of MS and MIS in relation to SMIT. Therefore MS and MIS research were selected

[128] *A theory is said to be grounded in the social activity it purports to explain, see Glaser and Strauss (1967) as cited in Woods (1999, p. 4)*

and used as theoretical data sources, which were meta-analyzed in order to identify factors that could be relevant in the development of a framework for SMIT. The focus of the analysis is in the identification of factors that can be used to explore SMIT. This thesis proposes a new framework, which represents new knowledge in relation to SMIT.

The analysis made in this thesis is therefore *inductive* because it generates relations between factors depending on the findings about the phenomenon. The analysis made in this thesis is also *descriptive* and *explanatory*, since it describes and explains the relationship between factors included in the framework. The analysis is *explanatory* because it constructs explanations from the facts found in theoretical sources (prior research). As Moriarty (1997) remarks:

> *An explanation may be considered as the narrative constructed around the facts to make the facts cohere. A narrative [..] tell a story of causal relations: how and why the event took place within a situation. Explanations are constructed within the context of models or paradigms*[129].
>
> *(Source: Moriarty, 1997, p. 16)*

The analysis is *descriptive* because it shows different stages and characteristics of the factors considered in the framework. However, some researchers affirm that descriptive and explorative analysis are almost the same, therefore a quote by Miles & Huberman (1994) is included below.

> *There are no clear boundaries between describing and explaining, but the researcher moves through a series of analysis episodes that condense more and more data into a more coherent understanding of what, how, and why.*
>
> *(Source: Miles & Huberman, 1994, p.91).*

[129] *"Paradigms offer a context within which a research question and a hypothesis are formulated and derive their significance." (Source: Moriarty, 1997, p. 16).*

Moreover, descriptive and explanatory analysis is also called analytic progression (Miles & Huberman, 1994, p.91). In this analysis process, the researcher tries to explain something until it is possible to understand what it is. As Rein & Schon (1977) suggest:

> *It is from telling a first 'story' about a specified situation…, to constructing a 'map' …., to building a theory or model (how the factors are connected, how they influence each other). I have constructed a deeper story, in effect, that is both -oriented and process-oriented*
>
> *(Source: Rein & Schon (1977) as cited in Miles & Huberman (1994, p.91)).*

5.1.4 Presentation of results

Research in the discipline of Management Science typically originates in practical problems. This is because manage science focuses on solving practical problems. Consequently, the solution of practical problems usually begins in an unstructured manner with the development of a model or framework for the problem that is being investigated [130]. Therefore, the development and understanding of a model or framework is a very valuable part of MS research. Since the contribution of this thesis is related to the discipline of Management Science, key parts of the results are presented in frameworks that may be used to explain the *strategic management of information technology*.

Strategies as models, frameworks, and approaches

Strategy research is traditionally represented using models, frameworks, and approaches[131]. Although these techniques are used for theory building they have different limitations. However, there are some differences between the implications of models, frameworks, and approaches.

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130 *See Arsham (2005, p. 13).*

131 *For further discussions about models, and frameworks see Porter (1991, pp. 97 – 98).*

Models abstract the context by isolating a few key factors and examining their relationships in depth. Models are also normative and only applicable in specific contexts that fit their assumptions[132].

Frameworks can be used to describe the relationship between several factors[133]. They can be analytical and are use to communicate strategy to others. Moreover, they can be combined with basic assumptions or approaches. In order to understand the meaning of a framework, a definition of frameworks is included in this section.

> *A conceptual framework explains, either graphically or in narrative form, the main thing to be studied – the key factors, constructs or factors – and the presumed relationships among them. Frameworks can be rudimentary or elaborate, theory-driven or commonsensical, descriptive or causal.*
>
> *(Source: Miles & Huberman, 1994, p. 18)*

Approaches are a combination of underlying assumptions. The application of approaches also depends on the fit between the context and the assumptions, for example, the philosophy behind the strategy.

5.2 Research design

Section 5.1.1 has justified the use of a qualitative research method for the research pursued in this thesis. The aim of this section is to summarize the qualitative method used in this thesis.

The research method selected for this thesis is qualitative research. Qualitative research analysis focus on[134] natural settings, meanings, perspectives, and understandings, emphasis in process, inductive analysis, and grounded theory. The *focus on natural settings* means that qualitative research is

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132 *See Porter (1991, p. 97).*

133 *See Porter (1991, p. 98), Miles & Huberman (1994, p. 18).*

134 *See Woods (1999, p. 2).*

conducted through an intense and prolonged contact with a "field" or life situation[135]. The *interest in meanings, perspectives and understandings,* implies that the qualitative researcher seeks to discover the perspectives related to a particular issue, to understand the inconsistencies, ambiguities, and contradictions of a phenomenon. The *emphasis on process* means that qualitative researchers are interested in how understandings are formed, how meanings and roles are developed. This accentuates the need for the researcher to become immersed in the field of analysis.

The qualitative research pursued in this thesis focuses on the identification of meanings*, perspectives and understandings* related to SMIT. My role as a qualitative researcher in this thesis was to seek and discover theories, perspectives, and frameworks related to SMIT; to understand consistencies, inconsistencies, ambiguities, and contradictions to the phenomenon. As a researcher, I was interested in how the previous understandings of strategic management and IT were formed, and how their meanings and roles have developed. Consequently as a researcher, I became immersed in the fields of Management Science and Management of Information Systems in the analysis. Having given a brief introduction to my role as qualitative researcher, the next section introduces the process of data collection.

5.2.1 Research focus for SMIT in this thesis

Since strategy, management, and information technology affect many areas, several disciplines investigate these issues (See Chapter 3). For example, *strategy* can be study by means of the disciplines of Strategy, Management Science, Strategic Management, and Management of Information Systems. Moreover, since information technology is an enabler of competitive advantages it seems that these disciplines investigate SMIT from their own perspectives. Consequently, much research includes some factors that can be related to SMIT. This thesis considers only the perspectives in the disciplines of

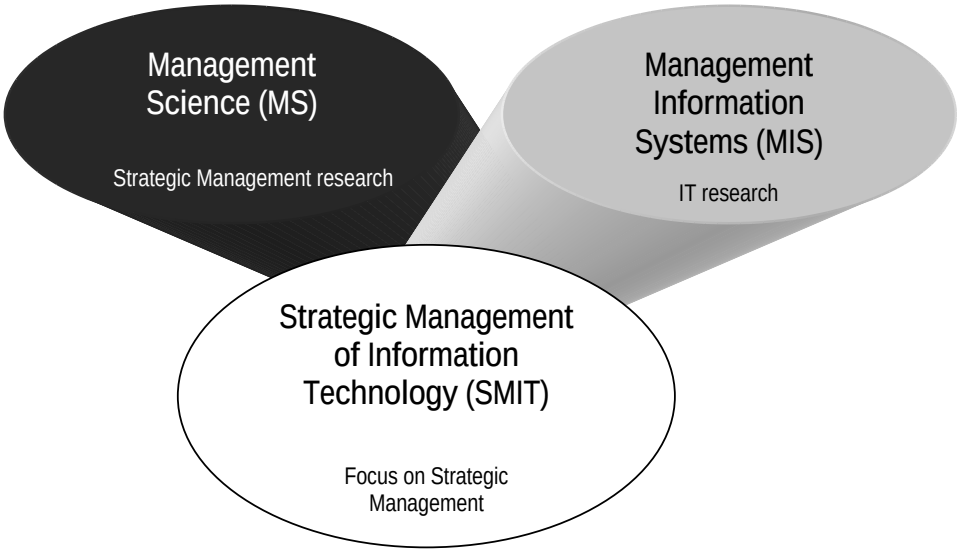
[135] *See Miles & Huberman (1994, p. 6)*

Management Science (MS) and Management Information Systems (MIS) (See 3.4). However, since the focus of research in MS and MIS disciplines overlaps, in relation to management and strategy, and is also limited regarding the strategic analysis of IT in competition, the knowledge produced by these disciplines may be ambiguous and difficult to apply in the understanding of SMIT.

The conceptual model for the analysis of SMIT pursued in this thesis is illustrated in Figure 8. The figure shows the disciplines with colored circles. The name of each discipline is shown in bold text and the domain of knowledge in cursive text. The middle of the figure shows a circle with *strategic management of information technology* indicating the focus of this research. However, the discussions presented in Chapter 3 and 4[136] shows that the research about SMIT considering strategic management and IT as main perspective is not covered by the parent disciplines discussed in chapter 4 (i.e. Management Science and Management Information Systems). Figure 8 shows therefore the analysis of SMIT in the middle of those disciplines, which indicates that part of the knowledge required to understand SMIT, may be found in MS and MIS Figure 8.

136 *Chapter 3 discusses the research of many disciplines, Chapter 4 discusses only the research of parent disciplines as Management Science and Management Information Science.*

Figure 8: Research focus for SMIT research in this thesis



(Source: Developed for this research from Sections 4.1–4.2.)

As shown in Figure 8, the disciplines of Management Science (MS) and Management of Information Systems (MIS) produce research that is related to SMIT. However, the scope of MS and MIS research is fragmented[137] in relation to the analysis of SMIT (See Chapters 3–4). While much of MS focuses on strategy research, much MIS research focuses on IT research. Consequently the MS and MIS perspectives are limited in exploring SMIT, in relation to relevant factors such as strategy and IT. Both factors are crucial to the analysis of IT, and require deeper analysis. Moreover, considering that *strategy* and *IT* factors belong to the domain of knowledge of different disciplines, the assumptions in previous research are limited by the assumptions of each discipline, i.e. MS and MIS. Therefore, the analysis of both factors, i.e. strategy

[137] *Much research analyzes strategy and IT as generic factors considering them as black boxes, without analyzing them in detail.*

and IT, creates a own domain of knowledge for SMIT. The focus of analysis in this thesis is Strategic Management.

The contributions of this thesis is to analyze strategic management and IT as fundamental factors in the achievement of competitive advantages from both MS and MIS perspectives, and to propose an explorative framework that include those factors and perspectives to increase the understanding of SMIT.

This research approach is also supported by the research of Dubravka (2000). According to Dubravka, the combination of factors originated in different disciplines, implies the creation of new knowledge that did not exist before. Therefore, a major contribution of this thesis is the analysis of strategy factors, and IT factors that focus on SMIT as a domain of knowledge.

5.2.2 Selection of the data sources

Chapter 4 has identified the discipline of Management Science (MS) and Management Information Systems (MIS) as sources of data for SMIT research. Moreover, Section 5.1.2 has justified the uses of theoretical data in this thesis. The data collected is used to propose answers to the aim (1.3) and the research questions (1.4). The phenomenon to be analyzed is SMIT and the focus of the analysis (5.2.1) is on strategic management and IT. The theoretical data sources used in this research include scientific publications, digital libraries, journals, articles, books, and doctoral dissertations (See References). The next sections will describe the selected sources.

The selection of scientific publications

Primary theoretical data sources used in this research were scientific publications in MS and MIS disciplines. The identification of scientific publications was done using the following definition:

> *An acceptable primary scientific publication must be the first disclosure containing sufficient information to enable peers (1) to assess observations, (2) to repeat experiments, and (3) to evaluate intellectual processes; moreover, it must be susceptible to sensory perception, essentially permanent, available to the scientific community*

> *without restriction, and available for regular screening by one or more of the major recognized secondary services (i.e., Biological Abstracts, Chemical Abstracts, etc…)*
>
> *(Source: Council of Biology Editors, 1968 as cited in Day, 1998, p. 9)*

Acceptable primary scientific publications in the research areas of IT, IT strategies, and business strategies were used. According to the definition above, data sources such as scientific journals and books can be selected as long as they are permanently available to the scientific community, and can be screened by secondary services.

However, since the amount of publications in journals is enormous in relation to strategic management and IT, qualitative selections of the sources were made. One prerequisite for selecting theoretical data sources was that it fit the aim (1.3), and research questions (1.4) presented in this thesis.

There is much research related to strategic management and IT, therefore scientific publications related to the phenomena are broad. To identify possible literature sources several digital libraries were used to facilitate the selection of theoretical data sources, and are described below.

Digital libraries

Digital libraries are used on the Internet to research scientific publications. A digital library is a database available on the Internet that has a vast collection of quotes and full text from different journals, publishers, and conference proceedings. Access to digital libraries may be free or may require a registration fee, and is usually available at university libraries.

Many digital libraries are available, because of the increasing amount of scientific publications. However, digital libraries differ in focus, scope, type and amount of sources. Therefore, it was especially important in this thesis to identify which digital libraries could be used to collect scientific publications related to the *strategic management of information technology*. In order to identify relevant digital libraries, a short evaluation was made of each university database. As a result of this evaluation, several digital libraries were selected: ACM, EBSCOhost, Emerald, IngentaConnect, LIBRIS, and Science Direct.

Table 17 summarizes the digital libraries used in this research in alphabetical order.

Table 17: Digital libraries used in the selection of theoretical data sources

Digital library	URL and short description	About the sources
ACM	http://portal.acm.org/dl.cfm Portal is published by the Association for Computing Machinery[138].	Journals, Magazines, Transactions, Proceedings, Newsletters, Publications by Affiliated Organizations, Special Interest Groups (SIGs)
EBSCOhost	Electronic Journal Services http://ejournals.ebsco.com/ The master A-to-Z title database provides link and coverage information to more than 76,000 unique titles from more than 750 database and e-journal packages from approximately 100 different providers.	More than 11,000 journals and 5.1 million articles
Emerald	http://puck.emeraldinsight.com Emerald publishes the world's widest range of management and library & information services journals[139].	114 journals covering engineering, technology, full text search over 50000 articles
IngentaConnect	http://www.ingentaconnect.com IngentaConnect is a free web service that collects academic and professional articles on line [140]	17 million articles from 28,000 publications (articles, chapters, reports and more.)

Continues

138 *Source: http://www.ebsco.com/home/ejournals/default.asp.*

139 *Source: http://puck.emeraldinsight.com/vl=7420799/cl=15/nw=1/rpsv/journals/index.htm.*

140 *Source: http://www.ingentaconnect.com/about/researchers/about_ingentaconnect*

Continued

Digital library	URL and short description	About the sources
LIBRIS	http://www.libris.kb.se Swedish national library system that makes available bibliographic services, such as search facilities, cataloguing and interlibrary lending. Searches can be carried out among the holdings of approximately 300 Swedish research libraries[141].	5 million titles, books and dissertations
Science Direct	http://www.sciencedirect.com/ over 1000 journals in life sciences, physics, medicine, technology and social sciences[142]	Over 2000 journals Almost seven million articles

(Source: developed for this research)

The digital libraries presented in Table 17, serve also as the entrance to several journals. Some characteristics of the journals considered in this research are explained below.

Journals

The journals selected were those that focused on strategic management and IT. The journals provided relevant publications used as sources of data to investigate concepts, theories related to SMIT. The publications selected were representative for the fields of Management Science (MS) and Management Information Systems (MIS).

The MS journals used were Academy of Management Journal, Harvard Business Review, Management Journal, Management Science, Sloan Management Review, Strategic Management Journal, The Executive's Journal

141 *Source: http://www.libris.kb.se/english/indexeng.jsp.*

142 *Source: http://www.info.sciencedirect.com/content_coverage/index.shtml.*

The MIS journals used were 'IBM Systems Journal', 'International Journal of Information Management', 'Journal of Applied Systems Analysis', 'Journal of Information Science', 'Journal of Information Management', "Journal of Industrial Technology, 'Journal of Information Systems', 'Journal of Information Systems Research (ISR)', 'Journal of Information Technology, 'Journal of Management Information Systems (JMIS)', 'Journal of Strategic Information Systems', and 'Management Information Systems Quarterly (MISQ)'. In addition, journals related to computer science were considered 'Communications of the ACM' and 'Journal of the Association of Computer Machinery (ACM)'. Table 18 presents a summary of the selected journals in alphabetical order.

Table 18: Selection of journals

Discipline	Journal
MS Journals	Academy of Management Journal Harvard Business Review Management Journal Management Science Sloan Management Review Strategic Management Journal The Executive's Journal
MIS Journals	IBM Systems Journal International Journal of Information Management Journal of Applied Systems Analysis Journal of Information Science Journal of Information Management Journal of Industrial Technology Journal of Information Systems Journal of Information Systems Research (ISR) Journal of Information Technology Journal of Management Information Systems (JMIS) Journal of Strategic Information Systems Management Information Systems Quarterly (MISQ)

(Source: Summarized from References)

The journals in Table 18 were used as sources of articles related to strategic management and IT. The next section describes the articles selected as theoretical data sources for this thesis.

Articles

The articles were selected through a combination of two types of keywords. The first type of keywords was related to the study objects whereas the second type of keywords was related to the context.

Keywords related to the study objects strategic management and IT were; designed to cover the scope of the terms explained above. The keywords related to strategic management were *strategic management*, *Business strategy*, and *Corporative strategy.*

The key words used to investigate IT were; IT, IS*,* IS/IT*, ICT*. The keywords related to IT strategy correspond to the scope presented above, for example *Information Systems Strategy* (ISS)*, Strategic Information Systems Planning* (SISP)*, Business Information Strategy* (BIS)*, IT strategy, IS strategy and ICT strategy,*

Others keywords were: *environment, strategic management, competitive strategy, and competitive factors*. A summary of these keywords is presented in Table 19.

Table 19: Keywords used in the selection of articles

Related to	Keywords
IT	"IT", "IS", "IS/IT", "ICT"
Strategic management	"strategy", "strategic management", "competitive strategy"

(Source: Developed for this thesis)

Books and doctoral dissertations

Others theoretical data sources included scientific books and dissertations in the research areas of business strategies and IT management. A preliminary selection of the books was made by using the search engine of the Swedish library database LIBRIS. The books chosen for the analysis were those the

contents of which refer to scientific publications. Scientific books such as *monographs* specialized books containing the opinions of many scientists, *reference books* containing facts, and *textbooks* used in academic programs were used as data sources.

Having given a description of the theoretical data sources used in this thesis, the next section describes the process of data analysis followed in this research.

5.2.3 Supportive theories

In research into *strategic management of information technology,* two major theories were used as the basis for the analysis in this thesis; contingence theory and systems theory. In order to give an understanding about contingence theory some definitions are included in Table 20.

Table 20: Definitions about contingence theory

Author	Definition	Discipline
Lawrence & Lorsch. (1967)	"[Contingency theory] states that in order to take advantage or organizational opportunities, management must find a proper fit among key factors including environment, strategy, technology, and size" (Source: Lawrence & Lorsch 1967 as cited in Kearns & Lederer, 2004, p. 900)	Management Science
Ives et al. (1980, p. 930)	"A contingency theory identifies alternative actions and presents factors for consideration in selecting the optimal alternative. Contingency theory for application development suggests, for instance, there may be different development methods for different types of ISS [Information systems subsystems], different types of computer operations for different types of organizations, and different ISS characteristics for different types of users." (Source: Ives et al., 1980, p. 930)	Management Information Systems

(Source: Definitions selected from the References)

As Table 20 shows, *Contingence theory* is used in both Management Science and Management of Information Science disciplines. In the discipline of MIS, contingence theory is applied because it analyzes the combination of several factors, and this can be used to advantage in MIS research. According to the definition presented by Lawrence & Lorsch (1967), contingence also means the need for alignment between all resources. In contrast, the definition presented by Ives et al. (1980) implicitly considers alignment when addressing the need for an optimal alternative. This theory constitutes the basis for the analysis in this thesis. Therefore, the analysis of strategic management and IT are considered to be in alignment with the competitive environment in order to obtain any kind of competitive advantage.

In contrast, *Systems* theory considers the management of information technology in a holistic way[143]. According to this theory, technology interacts with the world in terms of integrated relationships. The use of this theory implies that the researcher should describe these interactions by the identification of the factors involved as well as the relationship between them. (i.e. Cardullo, 1996, p. 30). A good description of the system approach is given by Cardullo:

> *The system [144] view gives us a way of looking at complex management problems. It is a mode of organizing existing findings concerning the concepts of systems, and systemic properties and relationships. (p.29)*
>
> ….
>
> *The value of the systems concept to management of technology can be seen in terms of the factors of the manager's job of overall effectiveness and conflicting organizational objectives. (p.30)*
>
> *(Source: Cardullo, 1996, pp. 28–29)*

[143] *See i.e. Cardullo (1996, p. 29), Mason & Mitroff (1973, p. 475).*

[144] *System: complex whole; a set of connected things or parts; an organized body of material or immaterial things (Concise Oxford Dictionary as cited in Cardullo, 1996:30)*

In this thesis, IT is considered in the analysis as a system that should support business goals. Therefore, in the analysis of strategic *management of information technology* the perspective of the contingent theory and the systems approach is considered. Having given a description of the assumptions behind the analytical process, the next section introduces the process followed to build the framework.

5.3 Analysis and results

Section 1.3 introduced the aim of this thesis, which is to develop a framework for the *strategic management of information technology*. Therefore, this section describes the process followed to build the framework presented in Chapter 10.

The development of the framework proposed in this thesis follows the recommendations of Miles & Huberman (1994).

> *Conceptual frameworks should emerge from the field in the course of the study; the important research questions will come clear only gradually; meaningful settings and actors cannot be selected prior to field work; instruments, if any, should be derived from the properties of the setting and its actors' views of them.*
>
> *(Source: Miles & Huberman, 1994, p. 17)*

According to Miles & Huberman (1994), the framework should emerge gradually from the analysis of the discipline in study, and should consider the settings for the particular research.

The analysis for the development of the framework can be summarized in two steps. The first step is the conceptualization of SMIT as a phenomenon in Chapter 2. The second step is the development of the framework (Chapters 3–10).

The analysis starts with the conceptualization of SMIT as a phenomenon in Chapter 2. The conceptualization is achieved by analyzing the epistemological components of SMIT such as Strategy, Management, Information, and

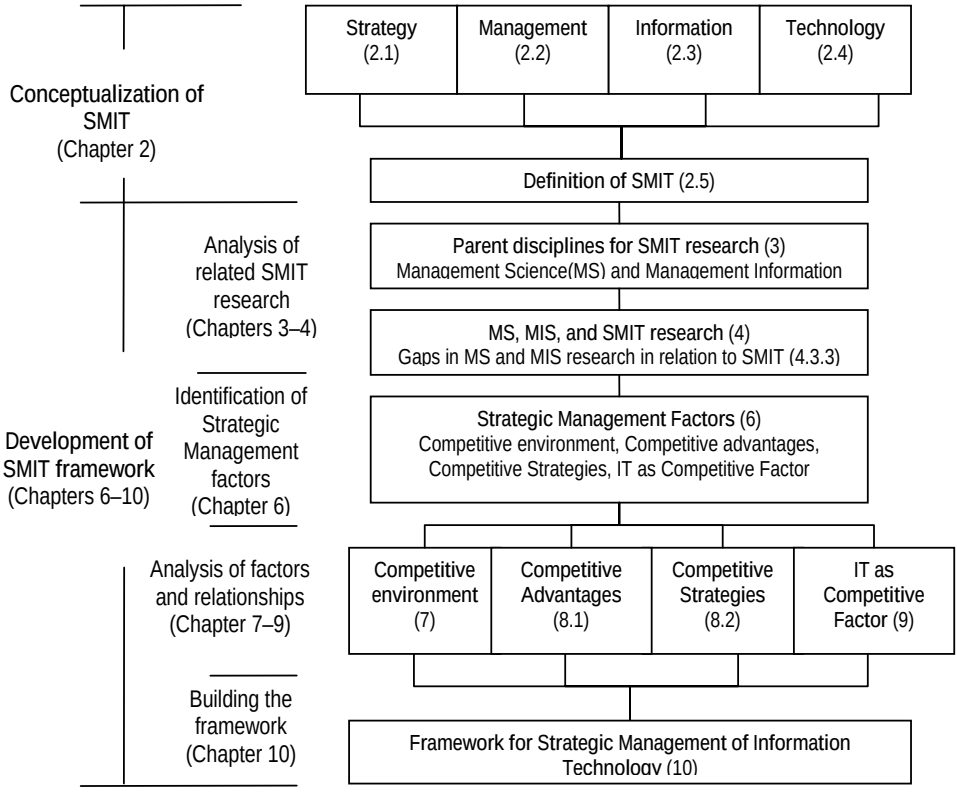
Technology (Sections 2.1–2.4). As a result of the analysis presented in Sections 2.1–2.4, a definition of SMIT (2.5) is proposed and used as the basis of the analysis conducted in this thesis.

The second step is the development of the SMIT framework. The development of the framework is conducted in four stages. The first stage is the analysis of SMIT related research in Chapters 3–4. The second stage is the identification of Strategic management in Chapter 6. The third stage is the analysis of the factors in Chapter 7–9. And the fourth stage is the building of the framework in Chapter 10.

The analysis of SMIT related research in Chapters 3–4. Chapter 3 executes a meta-analysis of the epistemological components of SMIT as presented in Sections 2.1–2.4 to identify sources of related research. Chapter 3 presents Management Science (MS) and (MIS) as parent disciplines for the research of SMIT. Chapter 4 analyzes MS and MIS research in relation to SMIT to identify the state of the art of SMIT related research, summarizing the gaps in MS and MIS research in relation to SMIT as a domain of knowledge (4.3.3). The identification of strategic management factors is conducted in Chapter 6, which focuses on factors such as Competitive Environment, Competitive Advantages, Competitive Strategies, IT as Competitive Factor. Chapters 7–9 continue the analysis of each strategic management factor, in order to identify descriptive aspects and possible relationships. Finally, Chapter 10 builds the framework by integrating the results of Chapters 6–9.

Figure 9 illustrates the analysis presented in this thesis to develop arguments to support the proposed SMIT framework.

Figure 9: Analysis presented in this thesis from the perspectives of Management Science (MS) and Management Information Systems (MIS)



(Source: Developed for this thesis from the analysis made in Chapters 2 –10)

Figure 9 summarizes the steps followed in the analysis conducted in this thesis. The contributions of this analysis are the combination of the perspectives from two disciplines, i.e. MS and MIS, and the analysis of IT as

competitive factor from the perspective of Strategic Management. The next sections will briefly describe the meaning of each step.

5.3.1 Conceptualization of SMIT phenomenon

As Figure 9 has shown, the first step in the analysis was used to achieve the conceptualization of SMIT as phenomenon (See Chapter 2). The conceptualization of SMIT is done by a meta-analysis of definitions related to SMIT.

Section 5.2.1 introduced that this thesis focuses on the analysis of the perspectives of MS and MIS as parent disciplines in relation to strategic management and IT (See Chapter 4 and Figure 8). Although, there are other definitions and perspectives in other disciplines (See Chapter 3), they are considered beyond the scope of this thesis, and are not included in the analysis (See Section 1.6 Delimitations of the research).

In order to conceptualize SMIT, Chapter 2 selected definitions from the references to illustrate similarities and differences in MS and MIS perspectives in relation to Strategy, Management, Information, and Technology (See Figure 2). These definitions were analyzed in order to identify common characteristics that could be used to define SMIT.

Having given a description of the first step in the analysis presented in this thesis, the next section describes the second step that includes the analysis of factors and relationships.

5.3.2 Analysis of related SMIT research

Figure 9 shows that the second step in this thesis is the analysis of SMIT related research presented in Chapter 3. Chapter 3 has shown that extensive research is available in relation to SMIT, however the research is limited in focus and perspective in explaining SMIT. As a result of the analysis conducted in Chapter 3, two disciplines are proposed as relevant for SMIT research in this thesis, the discipline of Management Science (MS) and Management Information Science (MIS) (See Section 3.4). Chapter 4 analyzes SMIT related

research by means of the disciplines of MS and MIS in order to identify their contributions and gaps in relation to SMIT (4.3). As a result of this analysis, the settings for the research conducted in this thesis are given in Section 5.2.1. According to Section 5.2.1 the focus of analysis of the framework is the integration of Strategic management and IT factors from the perspective of strategic management.

5.3.3 Development of the framework

As Figure 9 shows, the third step executed in this thesis is the analysis for the development of the framework that includes three stages: the first stage is the identification of Strategic Management factors, the second stage is the analysis of factors and relationships, and the third stage is the building of the framework. The next sections will describe the characteristics of this analysis.

Identification of Strategic Management factors

The identification of factors or dimensions of analysis is crucial for the development of a framework. This section describes the analysis done in this thesis to identify factors to consider in the framework. The identification of Strategic Management factors is presented in Chapter 6. Chapter 6 executes a meta-analysis of definitions of Strategic Management. Therefore, the following sections will describe specific characteristics of this analysis.

The data used in this analysis includes Strategic Management definitions found in the disciplines of MS and MIS (See Section 5.2.2) and considers the settings for the research presented in Section 5.2.1. The selected literature is analyzed focusing on the aim (See Section 1.3), the research questions (See Section 1.4), and the settings for the research (See Section 5.2.1). The definitions of Strategic Management analyzed in Chapter 6 have been selected from the references to reflect the perspectives of MS and MIS. Although there are others definitions in many other disciplines that may reflect other perspectives, they are considered beyond the scope of this thesis.

The Strategic Management definitions found in the disciplines of MS and MIS are used as data sources for this analysis. The definitions have been

selected from the references to illustrate the relation between strategic management and other factors, and to find common patterns between those definitions.

The analysis in this stage focuses on the evolution of strategic management definitions and the identification of common aspects from the perspective of several MS and MIS authors. Therefore, the analysis used in this thesis is both process and factor oriented. The process-oriented part is covered by the analysis of the evolution of the concepts related to strategic management as found in Chapter 6. The analysis of the disciplines of MS and MIS shows how meanings and definitions change over time. The factor-oriented analysis is done in Chapters 6–9.

Analysis of factors and relationships

Chapter 6 identifies strategic management factors such as Competitive Environment, Competitive Advantages, Competitive Strategies, and IT as a Competitive Factor. Each factor is further analyzed in Chapter 7–9 to explore aspects that can describe these factors and relationships between them. Each chapter analyzes one factor at a time and identifies aspects and relationships to other aspects. The contents of Chapters 7–9 are used to identify common patterns in the relationships between the constructs that are used to build a holistic framework for exploring SMIT. Considering that the data used for the analysis presented in Chapters 7–9 reflects the perspectives of several researchers in the disciplines of MS and MIS, observe common patterns are validated not only by several researchers, but from several perspectives.

Building the framework

The third stage in the analysis is building the framework. The framework is proposed in Chapter 10 and it is the product of a meta-analysis of theoretical research in the disciplines of MS and MIS related to SMIT, and my previous experience in the management of IT. Chapter 10 summarizes the analysis presented in Chapters 6–9.

The stages followed while building the framework are as follows:

1. The conceptual model for the analysis of SMIT presented in Section 5.2.1, Figure 8 is used to analyze MS and MIS disciplines. The model is used to identify factors related to SMIT, focusing on strategic management.

2. The disciplines, i.e. MS and MIS, are analyzed following the settings proposed in Figure 8. According to the figure, the discipline of MS is investigated focusing on strategic factors, and the discipline of MIS is investigated focusing on IT factors. Because of this analysis, relevant literature in these disciplines could be selected as sources of data.

3. Several strategic management definitions were selected from the references. As a result of the analysis of strategic management definitions, a set of common factors for strategic management was found. The common strategic management factors found are: Competitive Environment, Competitive Advantages, Competitive Strategies and IT as a Competitive Factor.

4. The data collected was analyzed in relation to the aim and research questions (1.4) to identify factors to include in the framework. The analysis started in Chapter 6 focusing on strategic management. As a result of the analysis of strategic management, a set of relevant factors for SMIT emerged. The factors that emerged in Chapter 6, were: Competitive Environment, Competitive Strategies, and Competitive Factors.

5. The factors proposed in Chapter 6 are further analyzed in Chapters 7–9, to find patterns in their relationships. Chapters 7–9 propose models of analysis for the factors found in Chapter 6. These models are later integrated into the holistic framework presented in Chapter 10. Chapters 7–9 analyze the factors found in Chapter 6, i.e. Strategic Management, Competitive Environment and IT. Each factor found in

Chapter 6 is further analyzed and summarized in models[145] of analysis. The analysis of the relationships between the factors is done by the identification of patterns[146] of association between factors and their common relations to different factors. Common causes and effects between these factors were analyzed to identify common patterns in their relationships.

6. The partial models and frameworks, given in Chapters 6–9 are integrated into a holistic framework for SMIT is presented in Chapter 10. The integrations follow the argumentation presented in those chapters.

This section has given a brief description about the process of developing the frameworks presented in this thesis. Further analysis of the assumptions behind these frameworks can be found in Chapters 6–10. The next section describes the contributions and relevance of this research.

5.4 Contribution and relevance

The contents of this thesis, expands the domain of SMIT knowledge with several contributions. One contribution is the analysis of strategic management factors, i.e. Competitive Environment, Competitive Strategies, and IT as Competitive Factor, from two different disciplines MS and MIS made in Chapter 6. Another contribution is the further analysis of each one of these factors conducted in Chapters 7–9, which identify specific characteristics and relationships to each factor. The final contribution is the integration of these factors and characteristics into a holistic framework for SMIT.

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145 *Models are graphical representations that include few factors (Porter, 1991, p. 97), while frameworks are graphical representations that include several factors. See also Porter (1991, p. 98), Miles & Huberman (1994, p. 18).*

146 *Moriarty (1997, p. 2), defines patterns as "a recurrent motive, event, attribute, or phenomenon."*

In order to position the framework presented in this thesis in relation to prior related SMIT research (See Chapters 3–4), this framework is distinct from previous research because it considers two different perspectives MS and MIS in its analysis. In contrast to MS research this framework explains the effects of IT in relation to Competitive Strategies, Competitive Outcome, and Competitive Environment. More over the framework proposed in this thesis identifies specific characteristics of IT that may be considered for achieving competitive advantages[147]. In contrast to MIS research this thesis analyzes the relation between IT and its Competitive Environment, which is not included in previous frameworks[148]. This research differs also from previous research because it analyzes IT as a competitive factor (micro perspective) and integrates the analysis into its effects in the competitive environment and competitive outcome (macro perspective). The framework presented is holistic and explorative because it proposes specific characteristics of analysis for Competitive Environment, Competitive Strategies, Competitive Outcome, and IT as Competitive factor. Consequently, the propositions of this thesis are fairly unique in relation to prior SMIT research. A further discussion about the contributions of this thesis is found in section 11.3.

This section has given a brief description about the contributions of this thesis in relation to prior SMIT research. The next section describes the validity of the results presented in this thesis.

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147 *Most frameworks and models include IT as a black box, see i.e. Baets (1992, p. 207) model for strategic alignment process.*

Other SMIT research analyzes specific technological, organizational, or economical aspects of IT. For further discussions see Zaheer & Dirks (1999, p. 94).

Other research relates IT to specific competitive strategy, i.e. Kalling (1999, p.131) focuses on aspects of IT related to the Resource Based view strategic perspective, Porter (2001) focuses on the analysis of IT in relation to his models five competitive forces (p. 67), and the generic the value chain (p. 75) .

148 *c.f. Clark (2001, p. 165) Framework for information systems strategic management.*

5.5 Validity

The validity of qualitative research, according to Woods (1999, p. 4) rests upon three main features; methods, data, and triangulation. One feature is *unobtrusive, sustained methods*, meaning that the methods leave the phenomenon undisturbed as far as possible. Another feature is *validation of the data.* The other feature is *triangulation,* which means the use of different researchers or methods, at different moments in time, and in different places. The following text explains the way in which this research has considered these features.

Unobtrusive, sustained method

Considering that the research in this thesis follows a theoretical approach, one can say that the phenomenon being studied, SMIT is undisturbed. Therefore, the method selected does not affect the outcome of the research. The data used in the analysis remains unchanged and can easily be checked by other researchers. Consequently, others may arrive at the same conclusions as those presented in this thesis.

Validation of the data

The validity of the results in qualitative research relies on the skills, competence, and rigor of the person doing the fieldwork (Patton, 1990, p.14). However, considering that this research is based on the theoretical data sources that are found in the disciplines of MS and MIS, the validity of the resources may also be related to the validity of the research considered in the data sources.

Triangulation

The use of a theoretical conceptualization warrants triangulation of the results. Since the data used in this analysis is collected from many researchers, from the MS and MIS disciplines. Their previous research is produced in different places, times, journals, and disciplines. The factors included in the framework are triangulated in prior research. This is because only common

factors found in different sources were considered as relevant for the framework.

5.6 Research biases

Section 5.1 states that the validity of qualitative research methods relies on the researcher. Moreover, Section 5.5 introduces other validity factors related to qualitative methods. Therefore, in this section the limitations of the qualitative method used in this research are analyzed in terms of the biases that may be found in scientific sources, and myself as a researcher. In order to understand the effect of a bias, this section starts by defining the term *bias*.

> *A **bias** is a prejudice in a general or specific sense, usually in the sense for having a predilection to one particular point of view or ideology. One is said to be biased if one is influenced by one's biases. A bias could, for example, lead one to accept or not-accept the truth of a claim, not because of the strength of the claim itself, but because it does or does not correspond to one's own preconceived ideas.*
>
> *(Source: WikiPedia The Free Enciclopedia. Retrieved January, 16, 2006, from http://en.wikipedia.org/wiki/Bias)*

As defined here, the existence of biases explains why researchers may tend to accept certain theories, and deny others. In this section an analysis of the biases that may affect the results in this thesis is included below.

Biases that may have influenced the results of this thesis can be related to the background and prior working experience of three sources: (1) the scientific sources and (2) myself as a researcher. Each one of these possible biases is discussed in the following paragraphs.

5.6.1 Biases related to the data sources

The data collected for this thesis was obtained from research in the discipline of Management Science (MS) and Management Information Systems (MIS). The data collected from the discipline of MIS used in this thesis focuses on technological factors and does not consider the effects of the technology within its context, and much less factors related to strategic management. Until

now, MIS research has reacted to new IT developments and by the time the research starts new technologies are developed and demand further research. This consideration is also supported by Cardullo (1996):

> *The development of scientific knowledge is not cyclic. In some instances an application or device may precede the actual scientific knowledge that underlies the device.*
>
> *(Source: Cardullo, 1996, p. 5)*

Cardullo (1996) suggests therefore that research is pursued as a reaction to the development of new technologies; therefore IT related research is always a reaction to technologies in development. However, since the development of IT as technology is very fast, IT research is always behind. Research about new IT developments is first published in disciplines as computer science, and later in disciplines such as MIS. Therefore, much MIS research refers to previous technology. However, much effort was made in this thesis to identify common patterns that can be applied regardless of the technology used. This thesis considers Internet in the analysis. However, in cases of technology revolutions outside the scope of Internet, the identification of factors related to strategic management are necessary.

Because of the abundant amount of data that is available, a bias may be associated to the omission of important data sources for SMIT. However, much effort was made to include different perspectives for the identification of different factors. Another bias is related to the possibility that the data collected supports specific theories produced by well-known researchers. This phenomenon is primarily observed in the research in the same discipline. Therefore, it was very important to analyze the research of both MS and MIS disciplines. Different disciplines can have different theory preferences related to the same issues. In order to avoid this bias in the research, sources were investigated in the MS and MIS disciplines. Another way to avoid this bias was by focusing on the contents of the research and by considering the research of less known researchers. The focus in this thesis was on a search for knowledge that could bring more understanding to SMIT regardless of the prestige of the researchers.

5.6.2 Biases related to myself as a researcher

In research, it is possible that I as researcher contribute my own biases[149] that may affect the results of the analysis. My own biases are related to my theoretical background, as well as my prior experience[150]. My background lies in the area of industrial economy and computer science. Consequently, my prior knowledge and experience in those two fields affects the analysis of the data. Focusing on the perspective of a civil engineer in industrial economy, I considered that a company's main task is to gain profits and that may be achieved by using IT. In contrast, as a Computer Scientist, I also understand the benefits and problems related to IT and how they can affect a business.

Nevertheless, my practical work experience is mostly located in the area of Management Information Systems, since it is related to the implementation of IS in organizations, as well as the development of methods and routines for the use of computers in businesses. In this sense, prior to this study I have personally experienced the evolution in the field. Although, most of my experience occurred before the beginning of this study, it was used in two ways: (1) to identify relevant factors related to strategic management, the competitive environment and IT, and (2) to illustrate discussions with examples. Thus, the framework proposed will be the result of prior research as well as prior work experiences related to IT-strategies as perceived by me as an author.

According to Moriarty (1997, p.6) there are some biases related to the person who observes the phenomena, (in this case me as the researcher). She maintains that the reason for this bias is that there is a difference between *what you see* from *what you think you see*. Therefore, this bias may cause possible errors in the evaluation and interpretation of the data. In this sense, my prior

149 *Bias: distortion caused by the influences of prior knowledge and experiences.*

150 *The author's theoretical background and prior experience are found in the appendix.*

knowledge, and experience related to this phenomenon, may affect the way the data is interpreted in this thesis. As Moriarty (1997, p. 7) states:

> *Experience, knowledge, and preconceived beliefs influence our expectation in ways imperceptible to our conscious thought, and they condition our expectations in ways we do not always know.*
>
> *(Source: Moriarty, 1997, p. 7)*

This unconscious bias may well have influenced the selection of data sources, evidence and the interpretation of the results in this thesis. In my case, preliminary experience, would affect my own perceptions of the analysis of the evidence used to produce the results. Therefore, the evidence could be limited, or expanded to cope with the scope of my own prior experience.

Having given the contents for chapter 5, this chapter ends with a summary.

Summary of Chapter 5

Chapter 5 showed the methodological process followed in this thesis. The findings of this thesis are the results of a qualitative research approach. The phenomenon in study is the *strategic management of information technology* (SMIT). SMIT is analyzed from the strategic management perspective considering the effects of IT in the competitive environment.

This thesis uses theoretical data sources found in the disciplines of Management Science and Management information Systems. Therefore, its primary sources are scientific publications in the research areas of strategy, IT and IT strategies.

Part II :

ANALYSIS AND RESULTS

As shown in the outline (1.8), this thesis contains two parts: Part I and Part II. Part I introduces the research issues and the foundations for the analysis of the data. The aim of Part II is to answer the questions proposed in Part I.

Part II analyzes the data gathered from research in the disciplines of management science (MS), and management information science (MIS), in relation to the aim (1.3) and research questions (1.4). As a result, factors related to the strategic management of information technology (SMIT) are identified and presented in a framework.

Part II, presents the results of the analysis in Chapters (6–11). *Chapter 6: Strategic Management,* discusses the role of strategic management in competition, and identifies factors related to strategic management. *Chapter 7: Competitive Environment,* discusses the role of the competitive environment in competition and its relations to strategic management. *Chapter 8: Competitive Strategies and Outcomes,* discusses the role of theories of competition and their relation to competitive outcomes. *Chapter 9: Competitive Factors,* discusses the role of IT in competition. *Chapter 10: A Framework for Strategic Analysis Based on SMIT* summarizes the discussions of Chapters 6–9 in a framework for SMIT.

Chapter 6 initiates the analysis and identifies factors related to strategic management that are important to SMIT. Chapters 7–9, analyze further the factors presented in Chapter 6. The analysis made in Chapters 6–9 is used as the foundation for the framework presented in Chapter 10. Finally, Chapter 11 presents the conclusions of this thesis.

Chapters 6-11, provide partial answers related to the aim (1.3). However, each chapter provides answers related to the research questions (1.4). Table 21 summarizes the relation between the research issues introduced in Part I and the analysis presented in Part II.

Table 21: Relation between Part I and Part II

Research Issue	Related Discipline	Answers discussed in Section
Aim (1.3)	To develop a framework to explore the strategic management of information technology SMIT in competition. (Source: Section 1.3)	Chapters 6–10.
Research questions (1.4)	RQ1: What is the role of strategic management in competition? (Source: Section 1.4)	Chapter 6
	RQ2: Which factors are related to strategic management? (Source: Section 1.4)	Chapters 6–9
	RQ3: Which factors are related to IT? (Source: Section 1.4)	Chapter 9
Conclusions	In relation to the research issues, and data findings.	Chapter 11

(Source: Summarized from Chapters 1-11)

Table 21 shows that each chapter gives answers to specific research issues. Given a brief introduction to the contents of Part II, this thesis continues by presenting Chapter 6.

Chapter 6:

STRATEGIC MANAGEMENT

Chapter 1 introduced *strategic management* as a key issue to enable competitive advantages (1.1), and proposed three research questions (1.4) with which to explore SMIT. Therefore, the aim of Chapter 6 is to answer two research questions:

RQ1: What is the role of strategic management in competition?

RQ2: Which factors are related to strategic management?

(Source: Section 1.4)

These research questions (RQ1–2) are used to analyze the data in order to understand the role of strategic management and to investigate factors that can be important to consider in competition. The contents of this chapter are used as a foundation for the development of this thesis, and are therefore further discussed in Chapters 7–10.

The data sources used for the analysis made in this chapter are publications from 1965 to 2005, found in the discipline of Management Science. The publications were selected based on their contributions to the understanding of the role of *strategic management* in competition. The data collected was analyzed in relation to the aim (1.3) and the research questions (1.4).

Having given the aim and a brief description of the contents of Chapter 6, the next section introduces strategic management.

6.1 Strategic management

Section 1.1 introduced Strategic management as a key success factor for enabling competitive advantages. Therefore, the aim of this section is to analyze further the role of the strategic manager in enabling competitive advantages.

In order to illustrate the meaning of strategic management, some definitions are included in Table 22.

Table 22: Strategic Management Definitions

Author	Definition	Discipline
Johannsen & Page (1986)	The managerial process of developing and maintaining a viable link between the organization's objectives and factors and its environmental opportunities. (Johannsen & Page, 1986,p. 308)	Management Science
Alvesson,& Willmott (1996)	Strategic management focuses upon the competitive positioning of organizations in relation to the perceived opportunities and constraints posed by the (changing) contexts of their operation. From a managerial perspective, successful strategic management is conceived in terms of mobilizing factors in ways that strengthen the focal organization's command of its environment and/or weakens the position of competitors. (Source: Alvesson & Willmott, 1996, p. 129)	Management Science

Continues

Continued

Author	Definition	Discipline
Turban, McLean & Wetherbe (2001)	Strategic management is the way an organization maps the strategy of its future operations. It has long been associated with long-range planning. Today, strategic management includes three complementary activities: long-range planning, response management, and innovation. (Turban, McLean & Wetherbe, 2001, p. 77)	Management Information Science
Faulkner & Campbell, (2003a)	Strategic management is about charting how to achieve a company's objectives, and adjusting the direction and methods to take advantage of changing circumstances. (Source: Faulkner & Campbell, 2003a, p. 3)	Management Science

(Source: Selected for this section from References)

As Table 22 shows, several strategic management definitions were selected from the discipline of Management Science. These definitions were selected because they include factors related to strategic management. These definitions were analyzed to identify common factors related to strategic management.

First, Johannsen & Page (1986) relate the concept of strategic management to the consideration of *environmental opportunities,* which can be interpreted as competitive advantages. Alvesson & Willmott (1996) consider strategic management as related to *competition* but also as the ability to combine strategic factors to cope with changes. While Turban et al. (2001), include others' roles in the definition of strategic management as *predicting* the *future* operations of the firm. Even when Turban et al. (2001) do not use the term competitive advantage, the description of the activities that are included in their definition of strategic management correspond to activities that enable competition. In contrast, the definition of Faulkner & Campbell (2003a) is included because it

points out that strategic management relates to two factors: *competitive advantage*, and the *management of change*. Faulkner & Campbell (2003a), introduce not only the term *advantages* as the main aim of strategic management, but also indicates that the circumstances that surround competition may change continuously.

The definitions presented in Table 22, shows that the meaning of strategic management has changed over time. For instance, strategic management activities have changed from just being a long-range planning activity to being a proactive or reactive activity, which tries to balance the characteristics of the competitive environment. Consequently, the strategic management task has become more complex during the last decade.

Strategic management increased *complexity* because of several reasons. The first reason is cause by the fact that strategic management today, tries to achieve more complex business goals than the ones achieved in the past years[151]. Other researchers[152] believe that complexity is due to changes in the dynamic competitive environment that produce *uncertainties* related to competition. Some other researchers[153] affirm that complexity is caused by strategic management is executed by people who have complex assumptions. Summing up these arguments one can say that strategic management is a complex task due to changes in an organization's goals, environment and people.

Analyzing the nature of the factors presented above, one can say that strategic management deals with internal and external factors. Among the internal factors, one can consider other managers, business goals and competitive resources. Among the external factors (factors outside the boundaries of the business), one can consider the competitive environment,

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[151] *See i.e. Bailey & Johnson (1992) as cited in Faulkner et al. (2003a, p. 4), Mintzberg et al. (1991, p. 5).*

[152] *See i.e. Cardullo (1996, p. 46), Faulkner & Campbell (2003, p. 3), Turban et al. (2001, p. 77).*

[153] *See i.e. Bailey & Johnson (1992) as cited in Faulkner et al. (2003, p. 4).*

competitors' strategies and changes. Moreover, both internal and external factors can change over time, changing the premises of competition and making the strategic management task much more complex. The strategic manager has to consider the combination of internal and external factors to be able to achieve competitive advantages. However, these competitive factors may change over time and affect the strategic manager's choices for competition.

6.2 The role of strategic management

Section 6.2 introduced some definitions about strategic management. Therefore, the aim of this section is to analyze those definitions in order to identify the role of the strategic manager in the organization.

In a further analysis of the definitions presented in Table 22, the role of strategic management can be summarized in the following activities: identification of the future competitive environment[154], identification and development of competitive strategies[155], identification of competitive factors[156], management change[157], and achievement of strategic alignment[158]. Having given these roles for strategic management, sections 6.2.1–6.2.5 describe the importance of each one of these roles in competition. Table 23 summarizes these results.

[154] *See i.e. Cardullo (1996, p. 46), Faulkner et al. (2003, p. 3), Turban et al. (2001, p. 77).*

[155] *See i.e. Faulkner et al. (2003, p. 3), Turban et al. (2001, p. 77).*

[156] *See i.e. Cardullo (1996, p. 46), Turban et al.(2001, p. 77).*

[157] *See i.e. Faulkner et al. (2003, p. 3), Turban et al.(2001, p. 77).*

[158] *See i.e. Mintzberg et al. (1991, p. 5).*

Table 23: The Role of Strategic Management

Role	Author
Identification of the future competitive environment	Cardullo (1996, p. 46), Faulkner et al. (2003, p. 3), Turban et al. (2001, p. 77).
Identification and development of competitive strategies	Faulkner et al. (2003, p. 3), Turban et al. (2001, p. 77).
Identification of competitive factors	Cardullo (1996, p. 46), Turban et al. (2001, p. 77).
Management change	Faulkner et al. (2003, p. 3), Turban et al. (2001, p. 77).
Achievement of strategic alignment	Mintzberg et al. (1991, p. 5).

(Source: Further analysis of Table 22)

Table 23 summarizes the roles related to strategic management. Therefore, the following section will introduce the meaning of these roles.

6.2.1 Identification of the future competitive environment

In a further analysis of Table 22, it was found that several authors[159] relate strategic management to the identification and prediction of the future competitive environment. Therefore, the aim of this section is to explain the meaning of this role in competition.

The action of predicting the future is also known as forecasting. Predicting is about the proactive identification of changes, trends in industries and the actions of competitors. The identification of trends and changes in the competitive environment is required to cope with competitors. In order to predict the future competitive environment, it is important to understand the time related to changes. Pitkethly (2003, p. 243) also supports this argument when he says, "*Understanding the rate of change in the environment is thus just as important as understanding what changes are occurring."* The consideration of time is important for competition, because being too late or too early with a

[159] *See i.e. Cardullo (1996, p. 46), Turban et al. (2001, p. 77), Faulkner et al. (2003, p. 3).*

competitive strategy may affect the benefits of the advantage. Considering time in the prediction means that trends may change over time, making the prediction a dynamic factor that relates to the dynamic factors of strategy. Consequently, in order to use strategic management as a tool to influence the outcomes of competition, a continuous prediction of the future competitive environment should be done.

The identification of the competitive environment is important for strategic management because it makes possible the identification of adequate competitive factors to the given environment, and it allows us to cope with environmental uncertainties. Considering that the competitive environment is an important factor related to strategic management, it is further discussed in Chapter 7.

Given the importance of the identification of the competitive environment as a role related to strategic management, the next section introduces another role for strategic management.

6.2.2 Identification and development of competitive strategies

In a further analysis of Table 22, it can be seen that several authors[160] relate strategic management to the identification of competitive advantages. Therefore, the aim of this section is to understand the relation between strategic management and competitive advantages.

In order to cope with competition strategic managers develop competitive strategies that can lead to enhance or maintain competitive advantages. However, the identification of competitive strategies is related to the competitive environment. Once the environment has been identified, it is time to identify a way to compete in that environment. A way of competing in the environment may be described by the combination of business strategies to compete in the specific market, and a way to identify and manage competitive

[160] *See i.e. Faulkner et al.(2003, p.3), Turban et al. (2001, p.77).*

factors. Since this task is very complex, theories of competition are used as grounds for the identification of competitive strategies. Theories of competition thus influence the selection, valuation and integration of competitive factors into an integrated competitive strategy. Considering that competitive strategies are a relevant factor related to strategic management, they are further discussed in Chapter 8.

Having given the importance of competitive strategies in competition, this section continues by presenting another role for strategic management.

6.2.3 Identification of competitive factors

A further analysis of Table 22, shows that several authors[161] relate the role of strategic management to the identification of competitive factors. Therefore, the aim of this section is to explain the importance of this role in competition.

The *identification of competitive factors* relates to the selection of adequate factors, competences and capabilities that fit the competitive requirements of a given competitive environment. The identification of competitive factors is important in the formulation of strategies. This is because; it helps managers to focus on assets that can enhance business benefits, and to estimate when it is necessary to change factors that do not add advantages. Chapter 9 expands on the discussion of competitive factors.

6.2.4 Management of change

In a further analysis of the contents of Table 22, one can observe that several authors[162] relate the role of strategic management to the *management of change*. Therefore, the aim of this section is to explain the importance of the *management of change* in competition.

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[161] *See i.e. Cardullo (1996, p. 46), Turban et al. (2001, p. 77).*

[162] *See i.e. Faulkner et al. (2003, p.3), Turban et al. (2001, p.77).*

Management of change is related to response activities aimed to cope with competitors' actions in the competitive arena. The need to manage change became clear during the 1990s, not only due to changes in the competitive environment, but also due to changes in information technology. This challenge is well described in the example presented by Whipp (2003):

> *In 1999 the Economist Intelligence Unit and Andersen Consulting questioned 350 senior managers from around the world on the subject of corporate change. Although half had experienced major changes in their business in the past five years, they expected more radical changes by 2010. Only 3 percent considered their organizations had the techniques to withstand the demands presented by, for example, small, fast-moving knowledge-based companies. Almost 40 per cent cited Lie skills of people management, communication, and relationship building as lacking in their organization. Only 4 per cent claimed that they were 'very well' prepared for the changes of the next decade.*
>
> *[Source: Whipp (2003, p.240)]*

The results of that study show that corporative managers are unprepared for changes in the competitive environment. Therefore, the ability to prepare the organization to respond to changes in the future is one major challenge of future strategic managers.

According to Whipp (2003, p. 237):

> *Businesses are confronted by: new bases of competition, the redefinition of whole sectors, and the continual re/establishment of innovative practices by leading companies from across the globe. Whilst micro-electronic and communications technologies offer a platform for new products and services, they also led to the redrawing of competitive maps and the abandonment of long/established rules of engagement. Change has become the watchword of the era. The ability to handle the implications of such disturbance, at the level of the organization, is highly prized.*
>
> *[Source: Whipp (2003, p.237])*

This perception of the necessity to manage change is not new. Change has always existed in the competitive environment. However, today the speed of change is higher and its effects on competition are much more visible than what they were before. The fast development of IT as technology and its

impact on competition makes *change* an important factor to analyze in order to achieve competitive advantages in the future.

6.2.5 Achievement of strategic alignment

In a further analysis of the contents of Table 22, one can observe that several authors[163] relate strategic management to the achievement of strategic alignment as an important role to achieve competitive advantages. Therefore, the aim of this section is to explain the importance of strategic alignment in competition.

Strategic alignment is about the achievement of fit or congruence between strategies. Strategic alignment[164] means that all the strategies used within a company must harmonize, be consistent, and support each other at all organizational levels in order to produce results. Consequently, most researchers[163] agree that strategic alignment is required to achieve competitive advantages. This is because companies may require a combination of several competitive strategies that may use the same competitive factors, for example, money, people, and systems. Consequently, in order to achieve competitive advantages alignment between different strategies is needed to produce results.

Having given the roles of strategic management, the next section continues with an analysis of factors related to strategic management.

6.3 Factors related to strategic management

Sections 6.1–6.2 introduced definitions and the role of strategic management. Therefore, the aim of this section is to further analyze those sections and identify relevant factors for strategic management.

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163 *See i.e. Buxbaum (2001), Chan (1999), Curtin (1999), Henderson & Venkatraman (1999), Luftman et al. (2004), Porter (1991).*

164 *See Porter (1996), "What is Strategy," Harvard Business Review Nov-Dec (1996), pp. 70–75.*

Section 6.2 introduced five roles related to strategic management: the identification of the competitive environment, the identification of competitive strategies, the identification of competitive factors, management of change, and strategic alignment (See Table 23). A further analysis of these roles was made to identify factors related to strategic management. As a result, it was found that some roles specify strategic approaches, while other roles specify strategic factors; moreover it was found that strategic approaches can be applied to strategic factors. For instance: the strategic management role of the *identification of the future competitive environment*, applied to the factor *competitive environment*, the *identification and development of competitive strategies* applied to the factor *competitive strategy*, the *identification of competitive factors* applied to *competitive factors*. However, the role of *management change*, and *achievement of strategic alignment* did not specify any factor at all. Analyzing the implications of these open roles, one can conclude that they should apply to common strategic factors. The question was: How to identify common strategic factors? To identify common strategic factors, Sections 6.2.1–6.2.3 were further analyzed, and it was observed that the same role 'identification' applied to all factors, i.e. competitive environment, competitive strategies, competitive factors. Considering that these different factors relate to the same role, i.e. identification, this thesis assumes that these factors are to be considered as common factors for strategic management. Consequently, the roles of management change and strategic alignment should also apply to those common strategic factors.

To sum up, the roles related to strategic management are selection and evaluation, the management of change and strategic alignment. The strategic factors related to strategic management are the competitive environment, competitive strategies and competitive factors. Table 24 summarizes the characteristics of strategic management.

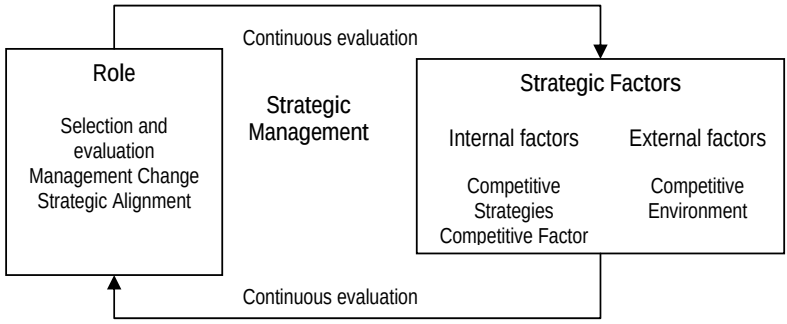
Table 24: Characteristics of Strategic Management

Characteristics of Strategic Management	
Roles	Selection and Evaluation
	Strategic Alignment
	Management Change
Strategic Factors	Competitive environment
	Competitive Strategies
	Competitive Factors

(Source: Further analysis of Table 24)

Considering the propositions in Table 24, a model for the understanding of strategic management may include two categories: *role,* and *strategic factors*. The *roles* are related to strategic management selection and evaluation, management change and strategic alignment. These roles apply to three *strategic factors;* the competitive environment, competitive strategies and competitive factors. Considering the nature of these strategic factors they can be classified as internal or external factors. While *internal factors* are those that may be managed within an organization, i.e. competitive strategies and competitive factors, *external factors* are those outside an organization, i.e. competitive environment. Figure 10, illustrates the relation between these factors in a framework. Figure 10 shows that the role of strategic management is a continuous process of selection and evaluation, management change, and strategic alignment of strategic factors (i.e. such as the competitive environment, competitive strategies and competitive factors).

Figure 10: Strategic Management



(Source: Developed for this section from Sections 6.2 and 6.3)

Previous sections identified relevant roles and strategic factors related to strategic management that have a relevant impact on competition. Considering that the focus of analysis in this thesis is on the process of strategic choices, Chapters 7–9 discuss further the process of strategic choices related to the strategic factors presented in this chapter, i.e. the competitive environment, competitive strategies and competitive factors.

Having given a model for strategic management, this chapter continues by introducing strategic management perspectives.

6.4 Strategic management perspectives

Section 6.2 presented strategic management as an activity that involves different people working to achieve competitive goals. Therefore, the aim of this section is to identify people related to strategic management and their management perspectives.

Sections 2.3 and 6.2, introduced *strategic management* as in charge of the development and implementation of strategies that may diminish the gap to competitors. Lasting recent decades, information technology (IT) has become a major competitive factor used to enable competitive advantages. However,

competition due to IT is a complex phenomenon. Consequently, the achievement of competitive advantages through IT demands the cooperation of both business and IT managers. Therefore, this thesis analyzes strategic management by integrating two perspectives: business management and the management of IT.

Focusing on the role of a strategic manager, the competitive environment surrounding the strategic manager may vary depending on the role that the manager fills in the organization. Therefore, the competitive environment of business and IT managers may be different depending on the scope of their strategies. Much research[165] affirms that alignment between business and IT strategies enhances positive results in the implementation of competitive strategies. However, there are some differences in the strategic perspectives of business and IT managers. One difference is that business managers are interested in using IT to enable competitive advantages and to reduce the cost of IT. In contrast, IT managers are more interested in delivering information than in reducing cost, and are therefore willing to invest more in new technology. The following text discusses differences in these perspectives.

Having given an introduction to strategic management perspectives, this chapter continues with a description of the role of business management in competition.

6.4.1 Business management

Section 6.4 introduced business management as one perspective to consider in strategic management. The perspective of *business management* is usually described by presenting the role that a business manager fills within the organization. In large companies, the Chief Executive Officer (CEO) and the Chief Operating Officer (COO) may represent business managers, while in smaller companies only the CEO may be involved.

[165] *See i.e. Earl (1989), Mintzberg et al. (1991), Henderson & Venkatraman (1999).*

The role of business management

The role of business management includes several actions: to configure business in a way that produces profits, to increase market shares, to reduce costs, to select products and services, and to achieve the survival of the company. In order to be competitive, the business manager has to combine internal factors by using competitive strategies to achieve competitive advantages. Consequently, the role of business management is about being a competitive strategist. Figure 11, illustrates the relation between these concepts.

Figure 11: Internal factors related to Business Management

(Source: Developed for this thesis from Section 6.4.1)

Figure 11 shows that the perspective of business management is related to two factors: competitive strategies and competitive factors.

Having given the role of business management and the factors related to the role, this section continuous by analyzing IT management.

6.4.2 IT management

Several authors[166] recognize IT management as one important factor in achieving competitive advantages. One reason for this perception is that IT is available to any company. Therefore, the difference between success and failure by using IT no longer depends on the characteristics of IT as technology, but on managers' abilities to use IT strategically.

IT management is important for competition, due to IT's role in the achievement of strategic business goals and to its ability to enhance competitive advantages. These factors make IT management a very complex phenomenon because it has to integrate complex information and systems throughout the organization in a way that can achieve both business and IT goals. The Chief Information Officer (CIO) executes the function management of IT in large firms, in smaller firms the IT manager or business administrator executes that role.

Analyzing MIS research in relation IT management, researchers agree on five factors: (1) the management of IT is a complex phenomenon. (2) There is no such thing as the best strategy but a combination of strategies. (3) The management of IT is context related. (4) The management of IT is one of the most important factors for enabling competitive advantages due to IT. (5) The alignment of IT and business strategies is a key factor for best results.

The role IT management

This section explains the role of IT management in competition and identifies factors that can be used in the framework.

One important IT management role is to assure that IT investments bring some value to the organization. This is because investments in information

[166] *See i.e. Buxbaum (2001), Davis (1991, p. 3), Chan (1999), Curtin (1999), Gorry & Morton [1971, reprint (1989, p. 49)], Henderson & Venkatraman (1999), Lucas (2005, pp. 6–7), Luftman et al. (2004), Lundeberg et al. (1995), Rodriguez & Ferranti (1996, p. 47).*

technology (IT) may be high, not only in terms of the cost for technology, but also the cost related to the time spent in training the skill of the people that will be using IT. This argument is also supported by Gorry & Morton (1979, reprint 1989, p. 49):

> *The cost of managing personnel is generally twice that of the hardware involved in a typical project, and the ratio is growing larger as the cost of hardware drops and salaries rise.*
>
> *[Source: Taylor & Dean (1966) as cited in Gorry & Morton (1971, reprint 1989, p. 49)].*

Since alignment is an important factor to consider when enabling competitive advantages due to IT, other authors[167] agree that the role of the IT manager is to achieve strategic alignment with business strategies. The alignment between strategies is needed for several reasons: One reason is to create synergies between strategies, another reason is the organization and control of the results and the third reason is the coordination of business strategies. In this sense, all business strategies should be in alignment with IT strategies, and the *strategic manager of IT* could be the one that may the alignment possible.

For other authors[168], the role the IT manager is related to the management of choices and IT factors. With the dramatic progress in IT, the selection of IT choices has become a dynamic task. Therefore, the role of the IT manager is to identify IT factors that can support existent business goals and to identify opportunities for achieving new business goals by the use of IT. Since the effects of IT depend on the combination of different IT components, the IT manager has to identify groups of IT that can enable specific goals. Therefore, IT management has to plan and propose IT strategies using existing or new competitive factors to achieve specific goals. To do this task effectively, the

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167 *See i.e. Buxbaum (2001), Chan (1999), Curtin (1999), Henderson & Venkatraman (1999), Luftman et al. (2004).*

168 *See i.e. Davis (1991, p. 3), Gorry & Morton [1971, reprint (1989, p. 49)], Lucas (2005, p. 7), Lundeberg et al. (1995), Rodriguez & Ferranti (1996, p. 47).*

managers need to analyze and understand the assumptions behind IT as a competitive factor in order to create frameworks that can be used to meet the organization's goals.

Lucas (2005, p.7) proposes the role of IT management as related to the development of *IT strategies* that enable competitive advantages. Additionally, he also proposes that the role of *change management (for example,* regarding the implementation of IT and it effects changing the organization), and the role of *Managing value nets* (e.g. coordinating business with external business partners).

To sum up, IT management is related to three major roles. One role is the management of IT competitive factors[169] [170]. Another role is the management of IT strategies, for example strategic factors, values nets, integration, in sourcing, outsourcing and options for service. An additional role is to manage change, (or example the competitive environment and changes in technology.

Table 25 summarizes the role of management of IT.

Table 25: The Role of the IT Manager

Role of the IT manager	Author
Management of IT resources	Davis (1991, p. 3), Lucas (2005, p. 6), Lundeberg et al. (1995), Rodriguez et al. (1996, p. 47).
Management of IT strategies	Rodriguez et al. (1996, p. 47), Lucas (2005, p. 6).
Management of change	Lundeberg et al. (1995), Rodriguez et al. (1996, p. 47), Lucas (2005, p. 6).

(Source: Developed for this thesis from Section 6.4.2)

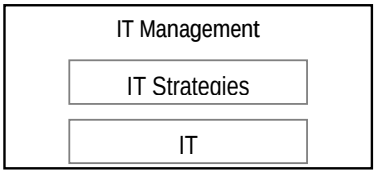
169 *See i.e. Davis (1991, p. 3), Lucas (2005, p. 6), Lundeberg et al. (1995), Rodriguez et al. (1996, p.47)*

170 *Some examples of competitive factors related to IT are people skills, information, and infrastructure.*

As shown in Table 25, the management of information technology is a complex process. Moreover, this process becomes more complex when organizations are composed of mergers and acquisitions, which make the management of IT more complex due to the incompatibility of existent IT characteristics.

IT management is responsible for the coordination of the uses of IT and the development of IT strategies to support business strategies in competition. Therefore, the IT manager is in charge of studying the effects and impacts of uses of IT in IT strategies that may affect the competitive environment. In this section, only the discussion of the role of the IT manager in relation to its competitive environment is included. To sum up, IT management is in charge of managing IT strategies and IT as a competitive factor. Figure 12 shows the relationships between these factors.

Figure 12: Internal Factors related to IT Management



(Source: Developed for this thesis from Section 6.4.2)

6.4.3 Framework for strategic management perspectives

Sections 6.4.1 & 6.4.2, introduced Business management and IT management as strategic management perspectives. The aim of this section is to integrate those perspectives into a common framework.

Section 6.4 analyzed strategic management as related to two perspectives: business management and IT management. Section 6.2.1 introduced business management as in charge of two factors: competitive strategies and competitive factors, and Section 6.4.2, introduced IT management as responsible for the development and implementation of IT strategies and IT.

Considering that both perspectives are part of strategic management, Figure 13 integrates both perspectives into a common framework.

Figure 13: Framework for Strategic Management Perspectives

Strategic Management Perspectives	
Business Management	**IT Management**
Competitive Strategies Competitive Factors	IT Strategies IT

(Source: Developed for this thesis from Section 6.4 and Figures 11 & 12)

Traditionally, business goals are concerned about increased effectiveness and enabling of competitive advantages, while IT goals are concerned with the support and integration of information throughout the organization [171]. However, the roles of the business manager and the IT manager are both needed in order to enhance competitive advantages through uses of IT. Therefore, these roles are both important to achieve the goals of the strategic manager.

This section has shown that two perspectives, i.e. business management and management of IT, are important considering strategic management as a competitive factor when using IT as a competitive resource. Consequently, in order to use strategic management as a competitive factor it is important to understand the role of strategic management in competition. Therefore, the next section will describe the strategic management perspectives considered in this thesis.

[171] *See Luftman et al. (2004, p.7)*

6.5 Framework for strategic management roles and factors

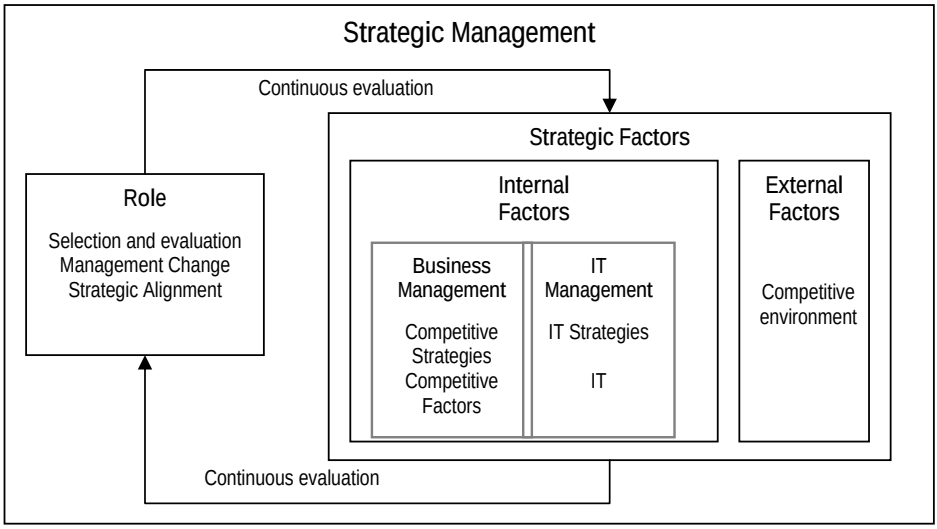
Section 6.3 presented a framework for the analysis of strategic management. The aim of this section is to position IT within the same framework.

Section 6.4 introduced two perspectives related to strategic management: business and IT management perspectives. In order to identify factors of business management and IT management to be included in the framework, this section starts by analyzing the roles of both perspectives.

Sections 6.1–6.3 presented several small frameworks for different factors related to strategic management. Therefore, the aim of this section is to integrate those small frameworks into a common framework for analysis.

Figure 14 illustrates the relation between the roles and strategic factors in strategic management.

Figure 14: Framework for Strategic Management Roles and Factors



(Source: Developed for this thesis from Fig. 10 & 13)

The following is a summary of the major results of Chapter 6.

Summary Chapter 6

Chapter 6 analyzed *Strategic Management* and its relations to IT, focusing on its importance and role in competition. This chapter analyzes the meaning of a *strategic management* perspective. The aim of this chapter was to identify factors related to strategic management that can be used to develop a framework.

Chapter 6 presented strategic management as one of the most relevant factors for competitive advantages. There are several reasons for this. The management of strategy is a complex phenomenon; therefore most managerial skills are related to the skills of individuals. Moreover, in dynamic competitive environments, competitive strategies have to be adjusted at short intervals in order to respond to competitor's strategies and changes in the environment. The definitions of strategic management presented in Table 22 show that the role of strategic management has become more complex. The role of strategic management relates to the following tasks: identification of the future competitive environment, identification of competitive strategies and competitive factors, management change, and strategic alignment. The role of the strategic manager primarily relates to the development of competitive advantages.

This chapter related strategic management to five roles (6.2): the identification of the competitive environment (6.2.1), the identification of competitive strategies (6.2.2), the identification of competitive factors (6.2.3), the management of change (6.2.4) and strategic alignment (6.2.5). These roles were further analyzed to identify factors related to strategic management. The roles identified as related to strategic management are management change, strategic alignment, and selection and evaluation. The strategic factors identified as related to strategic management are the competitive environment, competitive strategies and competitive factors. Strategic approaches are continued implemented on strategic factors in order to achieve competitive advantages. Figure 14 integrated strategic approaches and factors into a framework for strategic management.

Strategic management was discussed as a complex activity (6.1–6.2) that is related to two perspectives (6.4): business management and IT management. The complexity of strategic management may be explained by the fact that business managers and IT managers involve perspectives related to taken-for-granted assumptions and biases.

However, to relate the framework to IT, factors related to business management and IT management were identified (6.4). The factors related to the role of business management (6.4.1) are competitive strategies and competitive factors. The factors related to IT management (6.4.2) are IT and IT strategies. Figure 13 presents a framework for strategic management perspectives, and Figure 14 presents a framework that includes roles and factors related to strategic management.

Chapter 6 has identified several factors related to strategic management, i.e. competitive environment, competitive strategies, and competitive factors. These factors are included in the models presented in this chapter. Therefore, this thesis continues with further discussion of strategic management (Chapter 7), competitive strategies (Chapter 8), and competitive factors (Chapter 9).

Chapter 7:

COMPETITIVE ENVIRONMENT

Section 6.3 introduced the *competitive environment* as one of the factors related to strategic management. Therefore, the contents of this chapter aim to find further answers to the following question:

RQ2: Which factors are related to strategic management?

(Source: Section 1.4)

Chapter 7 discusses the competitive environment in order to identify relationships that may affect the strategic management of information technology. The contents of this chapter are later integrated into the holistic framework presented in Chapter 10.

Section 1.2 introduced the competitive environment in Management Science (MS) and Management Information Systems (MIS) research in relation to SMIT. In this section, MS and MIS research was reviewed focusing on the relation between competitive environment and strategic management.

A review of MS research focusing on *competitive environment* showed several patterns. The first pattern is that much research refers to the competitive environment, as a background, and does not discuss its characteristics. Prior to 2000 much MS can be found[172] considering the environment as static or stable.

[172] *See i.e. Porter (1985, 1991), Porter & Millers (1985), and research based on those theories.*

Few researchers[173] discuss the characteristics of the competitive environment. Moreover, the relations between managers' actions and the competitive environment are rarely discussed[174].

A review of MIS research focusing on the *competitive environment* shows that few researchers [175] study the relation between IT and the competitive environment. However, looking at these references[175] one can see that after 1996 research interest in the relation between competitive environment and IT has increased however much research is still needed.

Having given the status of MS and MIS research in relation to research into the competitive environment, the next section presents the contributions of this chapter to prior research.

The contribution of Chapter 7 differs from MS and MIS research in several ways. One way is that this chapter analyzes the relationships between the competitive environment and strategic managers' actions. Another way is that this chapter develops a framework (7.3) that can be used for the analysis of the competitive environment. Chapter 10 integrates this framework (7.3) into a holistic view.

7.1 Competitive environment

The section above presented an introduction to the importance of considering an analysis of the competitive environment. Therefore, the aim of Section 7.1 is to further analyze the characteristics of the competitive environment.

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173 *See i.e. Capodagly et al. (2001), Davis & Meyer (1998), Pitkethly (2003), Turban et al. (2006).*

174 *With the exception of Pitkethly (2003).*

175 *See i.e. Choe (2003), Kearns & Lederer (1999, 2004), Lederer & Salmela (1996), and Lee et al. (2005).*

Chapter 6 introduced the importance of the identification of the competitive environment as one of the roles of strategic management and stated that it is important to understand how the competitive environment may influence the choices of strategic managers. This is because the existence of competition, and the development of competitive strategies that may affect competition, are only justified in relation to the competitive environment. Therefore, it seems very important to start the analysis in this thesis with a discussion of the competitive environment that surrounds strategic management, and IT. Additionally, the competitive environment may affect the outcomes of competition by enhancing or restraining competitive advantages.

The competitive environment is also known as environment. The competitive environment is interpreted in this thesis as the context in which competition occurs. Therefore, the competitive environment can be described by all external conditions that may influence and affect a business organization's competition. Although, some researchers would consider the environment as the market, this thesis argues that the meaning of competitive environment is much broader.

In this thesis, the term competitive environment indicates the context that surrounds the business organization. The competitive environment is of high value for strategic management, due to its role in enhancing competitive advantages. Pitkethly (2003) explains the importance of the competitive environment in the following words:

> *Competitive advantage is in fact meaningless as a concept unless it is used in the context of a given competitive environment. An advantage has to be gained over something other than the possessor of the advantage, in respect of some criteria relevant to a common objective and in relation to a given location and competitive environment.*
>
> *(Source: Pitkethly, 2003, p. 243)*

According to Pitkethly (2003) the meaning of competition is to respond to the actions of competitors who exist within a given competitive environment, this may be interpreted in two ways. First, that it is not possible to address competition in a vacuum or outside a competitive environment. This is

because the act of competition is not possible in isolation. Instead, competition requires an environment in which to compete. Second, competition is context related to a specific environment. This also means that if the competitive environment changes; the competitive strategies should be adjusted to balance those changes. Consequently, the value of an understanding about the competitive environment is related to its role in the identification and selection of competitive strategies. Therefore, the contents of this section are used as a base in the selection of IT factors and IT strategies that can be used to enhance competitive advantages.

Having given the importance of the competitive environment in competition, the next section gives some characteristics of the competitive environment.

7.1.1 Characteristics of the competitive environment

In the analysis of MS and MIS research focusing in the *competitive environment*, two major patterns were found. Researchers[176] that consider the competitive environment as *static,* and researchers [177] that consider the competitive environment as *dynamic.*

Much research[178] assumes that the *competitive environment* is stable, and does not change over time, thus it is called *static.* When the competitive environment is considered *static*, discussions of environment are omitted and instead focus on competitive forces.

Some other researchers[177] assume that the competitive environment changes over time and is thus *dynamic*. When the competitive environment is considered

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176 *See i.e. Chan (1999), Henderson & Venkatraman (1999), Porter (1985, 1991, 2001).*

177 *See i.e. Ansoff & McDonnell (1990, pp. 3–11), Beck & Cowan (1996), Capodagly et al. (2001), Chandler et al. (1999, p.1), Pictkethly (2003), Whipp (2003), Volberda (2003).*

178 *For example, all research based on Porters' theories.*

dynamic, the discussions in MS and MIS research accept the dynamic environment as a fact, but rarely describe the characteristics of it.

To sum up, several researchers[179] claim that during the twentieth century, the competitive environment went through a lot of change and thus is *dynamic*, and is becoming more complex. Others strategy researchers[180] assume that the environment is *static*. However, changes in the competitive environment of a business organization are always present, but the rate of change may differ over time. Therefore, the same competitive environment can sometimes be perceived almost as *static* when the rate of change is low, and *dynamic,* when the rate of change is high. Consequently, dynamics change in the competitive environment and demand continuous reformulation of business strategies in order to survive[181]. In order to understand the characteristics of the changing environment, Table 26 (next page) summarizes some examples from the references.

179 *See i.e. Ansoff & McDonnell (1990, p.9), Pictkethly (2003), Whipp (2003), Volberda (2003).*

180 *See i.e. Porter (1985, 1991, 2001).*

181 *See i.e. Cummings (2003), Donovan (1997).*

Table 26: Characteristics of the Changing Environment

Author	Competitive environment	Definition
Davis & Meyer (1998)	Blur Economy	Describes the Blur economy as related to three factors: speed, connectivity, and intangibles. Speed [means that] every aspect of business and the connected organization operates in real time. Connectivity [means that] every thing is becoming electronically connected to everything else: products, people, companies, countries, everything. Intangibles [means that] every offer has both tangible and intangible economic value. The intangible value is growing faster. *(Source: Davis & Meyer 1998, p.5)*
Capodagly et al. (2001)	New Economy	Traditionally, an economy has been the management of factors in an essentially stand/alone local, national, or continental context. The primary indicators of an economy's health have been keyed to the production, distribution, and consumption of commodities – essentially hard goods. In the new economy, factors will transcend goods and services to include information, which is transformed into knowledge-based relationships to compete. *(Source: Capodagly, 2001, p. 20)*
Turban et al., (2006)	Digital Economy	The digital economy refers to an economy that is based on digital technologies, including digital communication networks (the Internet, intranets, and private value-added networks or VANs), computers, software, and other related information technologies. *(Source: Turban et al., 2006, p. 4)*

(Source: Summarized for this section from References)

As shown in Table 26 Davis & Meyer (1998) describe the competitive environment in terms of what they call the *Blur Economy*. They argue that within the Blur Economy there are three important competitive factors[182]: speed, connectivity and intangible value. Moreover, they argue that considering the nature of these factors, it is not easy to identify the boundaries between the company and the new economy. Consequently, strategy boundaries are also blurring, which challenges traditional strategic boundaries[183].

Capodagly et al. (2001) (See Table 26), describe the new competitive environment as the *New Economy* and imply that there are new competition ways. According to Capodably (ibid), competition is based on the combination of products/services with information, companies create new relationships channels between customers and industries that can be used as competition tools. Moreover, the uses of technology such as the Internet make it possible to reach all over the world, increasing therefore the level of impact of traditional channels and extending the competitive environment.

Turban et al. (2006) (See Table 26) describe the competitive environment using the term *Digital Economy*. According to his definition, *digital economy* focuses on Information Technology as the main competitive factor.

To sum up the characteristics of the competitive environment have changed over the years. As shown in Table 26 the competitive environment of the 21st century focuses on Information Technology (IT) as a competitive factor (for further discussion see Chapter 9).

Having given the characteristics of the competitive environment, this section continues by discussing the scope of the competitive environment.

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182 *See Davis & Meyer (1998, p.83).*

183 *For example, macro and microeconomics as formulated in industrial economy.*

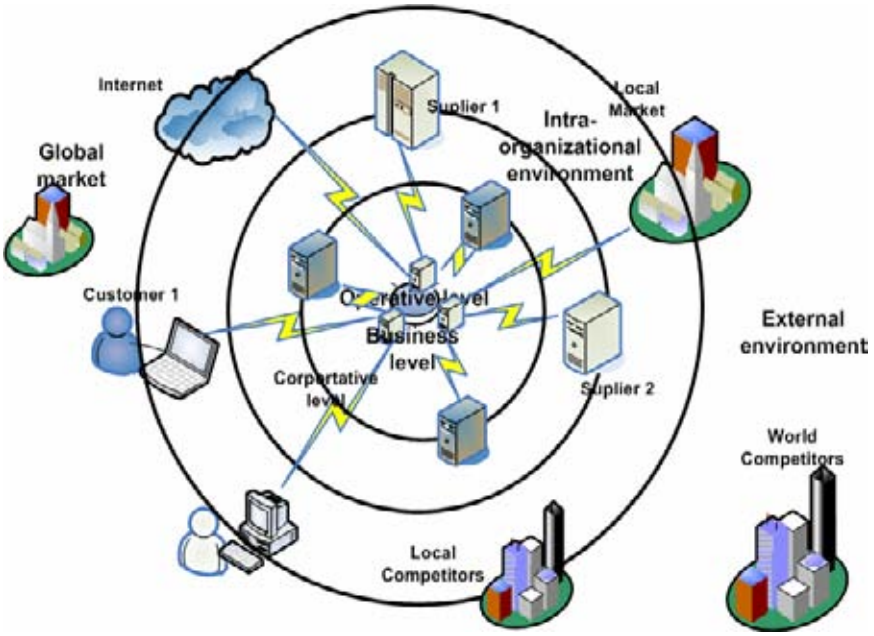
7.1.2 Scope of the competitive environment

One characteristic of the competitive environment is scope. Therefore, the aim of this section is to review its characteristics in MS and MIS research.

In MS and MIS research, the scope of the competitive environment is traditionally described by defining the boundaries of the business organization. This perception automatically divides the competitive environment into two dimensions: (1) the *internal environment* located within the boundaries of the organization, and (2) the *external environment* that is located outside the organization. The *internal environment* is related to the internal context of the firm. The internal environment is thus related to an organization's internal factors, core competences, and strategic alliances. In contrast, the *external environment* it is related to all context outside the organization and may include conditions that are not easy to change, for example, markets, inflation trends.

The internal/external conception about environment has been regularly used in MS and MIS research. However, with the increasing complexity of markets and organizations the uses of internal/external conception of environment is very limited. One example that illustrates the limitations of this conception is the use of the Internet in competitive strategy. The use of Internet solutions simultaneously affects the internal and external environments, which make the uses of this environment definition inadequate. Today by using the Internet a business organization is in contact with its business units, and with the global market. At the same time that it reaches customers, it reaches other business partners and other companies. However, this advantage may also become a disadvantage in the competitive market. This is because the Internet increases competition between businesses, making all businesses available to the customer regardless geographic location, and it increases competition by pressing down prices. Figure 15 illustrates how the Internet requires the extension of traditional boundaries.

Figure 15: Competitive Environment and IT

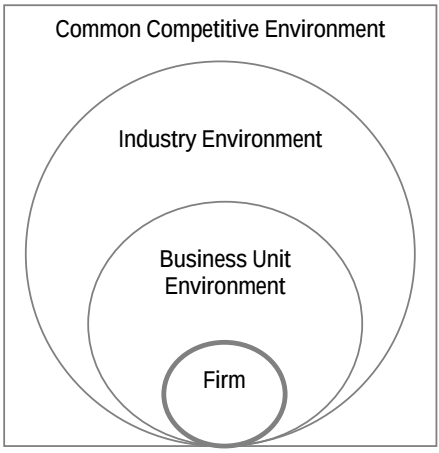


(Source: Developed for this thesis)

A more updated interpretation about environment is found in the work of Pitkethly (2003, p. 226), who in his environmental description includes several classifications: *a common competitive environment*, and *the competitive environment.* The *common competitive environment* is related to all the common factors that affect all related firms. The *competitive environment* also includes two classifications: the industry environment, and the business unit environment. First, the *industry environment* is represented by the industries that the firm competes in, and also by the strategic groups of companies that the firm forms part of. Second, *the business unit environment* includes the immediate competitive surroundings represented by firms, which compete for customers and added value. Pitkethly's (*2003*) model for the competitive environment is illustrated in Figure 16. In this model, the competitive environment consists of five sections: the firm, the business unit environment, the industry environment, the

competitive environment, and the common competitive environment. First, the *firm* environment is represented by a circle in the middle of the figure. The environment that is closer to the firm is shown with circles and is related to *business unit environment* and *industry environment*. The environment that is most separated from the firm is represented in Figure 16 with squares and it consists of the *common competitive environment*.

Figure 16: Scope of Competitive Environment



(Source: Adapted from Pitkethly, 2003, p.226)

Figure 16 shows the complexity of today's competitive environment. Therefore, factors that characterize the environment for IT are represented in this model.

One example of how the common competitive environment may affect the strategic management of IT is regarding countries' increasing investments in Internet infrastructure. Investments in national IT infrastructure will not only affect the business and the industry of the country but also may affect a global industry, and all related industries that support it.

The identification of the common competitive environment may be achieved by three techniques (Pikethly, 2003, pp. 241-245): (1) the identification of relevant factors, (2) the identification of trends, and (3) the identification of the global environment.

The *identification of relevant factors* in the common competitive environment may be done by using the model for analysis of Political, Economical, Social, and Technological factors (PEST). However, the use of this model may produce endless factors. Thus, the identification of relevant factors of the common competitive environment it is only possible after the identification of an organization's profitability factors at lower levels of environment, i.e. business unit, and industry environment.

The *identification of trends* is related to the strategic need to forecast how the competitive environment will change in order to determinate future changes in the advantage's scope. Thus, it is important to recognize patterns of changes over the time horizon to respond to changes faster than competitors and gain advantages.

The *global environment* is related to the analysis of national systems. Due to IT and the Internet, today it is possible to work globally. Business organizations may combine companies located in different nations which may position the organizations as the leaders of a global market. Therefore, the analysis of the global environment may be considered in order to achieve the business organization's long-term survival.

Having given the characteristics and scope of the competitive environment, the next section continues by discussing the challenges related to the competitive environment facing strategic managers.

7.2 Challenges facing strategic managers due to the competitive environment

Section 7.1 introduced the importance of the competitive environment and additionally Section 7.2 introduced the characteristics of the competitive

environment. Therefore, the aim of this section is to identify the relation between competitive environment and strategic management.

Implications of the competitive environment in strategic management can be found in the work of Pictkethly (2003, p.236). He points out three implications about the competitive environment which challenge the strategic management of a business organization; (1) changes in the environment, (2) determinism and strategic choice of competitive factors, and (3) environmental learning. Explanations to these implications are given in the text that follows.

Changes in the competitive environment

Section 6.2.4 introduced management change as one role of strategic management. Additionally, Section 7.1.1 showed that the competitive environment is continuously changing. Therefore, the aim of this section is to evaluate the management of changes in the competitive environment.

One challenge for strategic managers is the management of changes in the competitive environment. This is because changes in the environment have accelerated through two factors, *frequency of changes,* and *the rate of diffusion of changes* (Ansoff & McDonnell, 1990, p. 9). The high *frequency of changes* started according to Ansoff & McDonnell in the 1960s. The changes started with the proliferation of products and services, new technologies, and social/political shifts, which produced the so-called Second Industrial Revolution. The *rate of diffusion of change* is related to the speed with which new products and services invade markets.

The consequences of environmental changes for managers have been studied by Ansoff & McDonnell (1990, p. 9). They summarize the consequences in three factors. One factor is an increasing difficulty in anticipating change sufficiently in advance to plan a *timely response*. Another factor is the need for *increasing speed* of implementation of the response. An additional factor is the need for *flexibility* and timely response to surprises which cannot be anticipated in advance.

Determinism and strategic choice of competitive factors

Another challenge for managers owing to the competitive environment is related to determinism or strategic choices. As shown in Table 26, changes in the competitive environment affect the selection of competitive factors. The type of influence of the environment in strategic management has been explained by Pictkethly (2003, p. 236) in terms of (1) determinism, and (2) strategic choice. According to the deterministic view, there are two perceptions: *action determinism,* where the choices of those making strategic decisions are determined internally, and *environmental determinism* where the choices of those making strategic decisions are determined by the external environment constraining choice. Chapters 8–9 present further discussions of the relation between the competitive environment, competitive strategies and competitive factors.

Environmental learning

Environmental learning is according to Pictkethly (2003, p. 241) one of the most important possibilities to remain competitive. This factor relates to the strategic manager role that concerns forecasting the future. Learning about partners and competitors is only possible by analyzing the development of competitors, and technologies in the competitive environment.

Changes in the competitive environment demand that a business organization continuously evaluates and renews their strategies in order to cope with new competition. Moreover, the rate of change in the competitive environment is different for different firms and industries (Pictkethly, 2003). Therefore, changes in the environment challenge the strategic management of firms in their ability to adapt their strategies to respond to competition.

Moreover, the rules of competition may change due to changes in the competitive environment. One concrete example is that changes in the competitive environment automatically change the value of competitive factors. Therefore, in order to keep competitive advantages, continuous learning and review of competitive strategies is required.

The identification of future trends in the competitive environment is related to the role of predicting the future as presented in Section 6.2.1. The ability to forecast the future of the competitive environment can be used to act proactively and not reactively to changes. Moreover, this characteristic may be of high value in forecasting the competitive environment where the competitive factor is IT, owing to IT continuous changes.

Having given the characteristics (7.1.1), scope (7.1.2) and relation, i.e. challenges for strategic management (7.2), the next section integrates these results into a framework for the competitive environment.

7.3 Framework for competitive environment

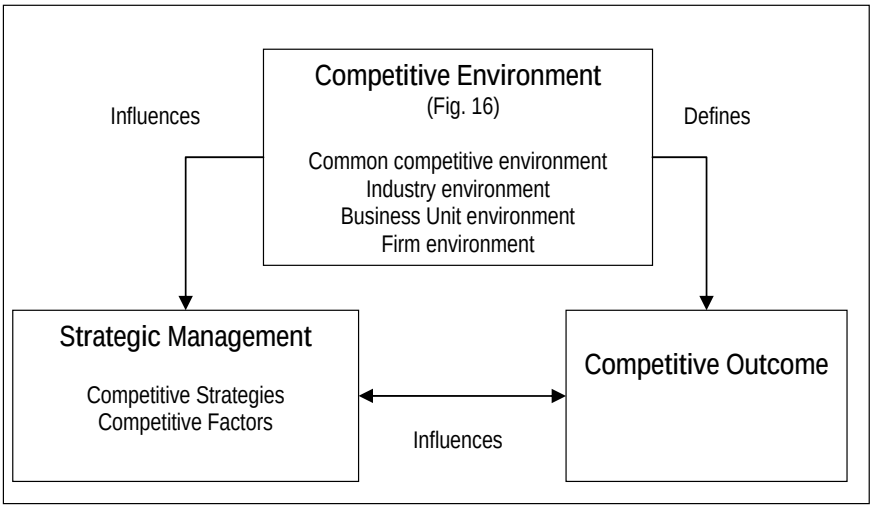
Sections 7.1 & 7.2 introduced many factors related to the competitive environment. Section 7.1.2, selected the propositions of Pitkethly (2003) that relate scope to several factors as the common competitive environment, the competitive environment, the industry environment, the business unit environment, and the firm.

Section 7.2 presented the implications of the competitive environment for strategic managers. The competitive environment has several implications for the development of new competitive strategies. The implications for management are related to the fact that the competitive environment creates not only a common perception about the level of impact of strategies, but also structures the environment in a way that makes possible the evaluation of strategy effects in competition. Therefore, the implications of the competitive environment for management are related to the selection and development of new competitive strategies and competitive factors.

The specific competitive environment *influences* the selection of competitive factors. For instance the industrial competitive environment may determine the selection of specific competitive factors within a specific industry. Moreover, cooperation between businesses partners in the delivery of product of services, may also determine the selection of competitive factors. First, the characteristics of the competitive environment vary depending on the scope

selected. The competitive environment is directly related to three factors: competitive strategies, competitive factors, and competitive outcomes. The nature of the relationship is that the competitive environment determines the selection of these values. Figure 17 illustrates in a framework, the relationships between these factors.

Figure 17: Framework for Competitive Environment



(Source: Developed for this section from Chapter 7)

As shown in Figure 17, two factors are directly related to the strategic environment: strategic management through competitive strategies and competitive outcomes, for example, as competitive advantages. The relation between the competitive environment and strategic management is that the competitive environment influences the choices of competitive strategies and competitive factors. The relation between the competitive environment and competitive outcome is that the competitive environment defines the outcome of competition. Considering the relevance of the factors presented in this framework, further discussions are presented in Chapters 8-9. Moreover, this framework is used as the basis for Chapter 10.

Having given the meaning of the competitive environment, the next section summarizes the results of this chapter.

Summary Chapter 7

Little research was found that discusses the relation between strategic management and the competitive environment. One major characteristic of the competitive environment is its scope (7.1.2). However, the propositions of Pitkethly (2003) were selected because they apply to the analysis of IT. Therefore, environmental factors such as the Common Competitive Environment, Competitive Environment, Industry Environment, Business Unit Environment, Firm Environment, were selected to be included in the final framework (Chapter 10).

The competitive environment influences strategic management (7.2). The major impact is represented by the speed of changes in the competitive environment, which increase the need to cope with competitive responses within a short period of time, but also with the need to continuous learn about from changes on the environment.

Finally, the chapter presents a framework for the competitive environment in Figure 17. This framework summarizes the results from Sections 7.1–7.1. Further discussions about the factors presented in this chapter are presented in Chapters 8 – 9. Moreover, this framework (7.3) will be included in the frameworks presented in Chapter 10.

Chapter 8:

COMPETITIVE OUTCOME AND COMPETITIVE STRATEGIES

Chapter 6–7 introduced competitive outcome and competitive strategies as related to strategic management. This chapter analyzes more in detail *competitive strategies* and *competitive factors* and their relation to strategic management. Therefore, the contents of Chapter 8 contribute to finding additional answers to the question:

RQ2: Which factors are related to strategic management?

(Source: Section 1.4)

The aim of Chapter 8 is to discuss the characteristics of competitive outcome and competitive strategy in order to identify additional factors and relationships that can be included in the framework for SMIT.

The chapter presents two discussions: competitive outcomes (8.1), and competitive strategies (8.2). The factors and relationships found in these discussions are summarized in a framework for competitive strategy (8.3).

Having given an introduction to the contents of chapter 8, the chapter continues with the next section that discusses competitive outcome.

8.1 Competitive outcome

Much MS and MIS research focuses on competitive advantages as the major goal for competition; however considering that the achievement of competitive advantages is a complex process, and that they are many actors in the

competitive process, no one can guarantee that the implementation of competitive strategies may lead to any competitive advantages. Moreover, even if competitive advantages are achieved, it is difficult to predict how long they will last.

This section argues that a more realistic focus for strategic analysis would be to consider *competitive outcome* rather than competitive advantages. By using a factor called competitive outcome, one can include in the analysis different competitive scenarios. Moreover, focusing on competitive outcome provides a realistic view of the effect of competitive strategies. Considering that the development and implementation of competitive strategies is still a complex phenomenon, there are no guaranties that the implementation of specific strategies can give a firm a particular competitive position.

There is always a competitive outcome due to the implementation of competitive strategies. Moreover, since competition is a continuous process, competitive outcome can take different values in different periods, depending on the strategies of the competitors. However, a competitive outcome may be difficult to predict, and it can only be defined in comparison with the outcome of other competitors in the competitive environment.

This thesis analyzes competitive outcome by focusing in three values: no advantages, competitive advantages, and sustainable competitive advantages. The next section will describe briefly the characteristic of those values.

8.1.1 No advantages

Section 8.1 introduced 'No advantages' as a possible outcome of the competitive process. Therefore, the aim of this section is to explain the characteristics of 'No advantages' as competitive outcome.

This thesis includes 'No advantages' as a value for competitive outcome because it is a realistic outcome. Although, the goal of strategies is to achieve competitive advantages, strategies may fail to achieve that goal. As strategic manager one should be aware that this is a possible outcome. For instance, competitive outcome with no advantage appears when firms implement

strategies to cope with the standards of industries in order to survive. These strategies do not enable any additional advantage, for example, strategies that are intended to cope with the strategies of competitors in order to survive in the industry.

Considering 'No advantages' in relation to IT, there are plenty of examples where the uses of IT may not lead to competitive advantage. One example is when competitors invest in IT and only focus on the acquisition of technology. Investing only in technology does not give any advantages. Copying technology does not produce any advantages because an advantage is a product of the use of the technology to support business and create more value. Another case is when companies invest in technologies that do not work well with existing technologies.

Having given an explanation of the meaning of competitive outcome with the value of 'No advantages' this section introduces 'Competitive advantages.'

8.1.2 Competitive advantages

Section 8.1 introduced 'Competitive advantages' as a possible outcome of the competitive process. Therefore, the aim of this section is to explain the characteristics of 'Competitive advantages' as competitive outcome.

Competitive advantage is included as a possible competitive outcome for several reasons. One reason is that competitive advantages represent a possible outcome of the competitive process (See section 8.1). Another reason is that the achievement of competitive advantages is one primary role of strategic management (See section 6.1). An additional reason is that by focusing in the achievement of competitive advantages, during the process of strategic analysis, strategic managers may combine strategies in ways that may affect the competitive environment.

This section argues that competitive advantages may not always be the traditional outcome of a competitive goal, because many factors related to strategic management are complex (See Chapter 6). However, competitive

advantages can be considered as a major goal for using strategies. Porter (1985a) defines competitive strategy as:

> *Competitive advantage is the ability to earn returns on investment persistently above the average for the industry.*
>
> *(Source: Porter, 1985a)*

According to Porter's (1985) definition, competitive advantage is related to the *"ability to earn returns,"* which relates to profit and economic benefits. Moreover, the economic benefit may be *"above the average obtained in the industry*," which indicates a position in the industry. Some critical points about Porter's definition are related to two issues: (1) Competitive advantages may also be achieved even when the results are not measured in economic terms, and (2) competitive advantages are also possible even when the company is not positioned above the average industry. Moreover, this definition has been criticized because it focuses primarily on external competitive factors, such as market position, and does not consider the effect of internal factors. This criticism is because market positions can change over time, and consequently, firms can lose their competitive advantage.

Competitive advantage as it is used in this thesis refers to the desired goal of competition, and it is related to company strategies with the aim of gaining any form of advantage, for example, profit, or non-profit.

Analyzing competitive advantages in relation to IT it was found that strategies for competitive advantages that only rely in the implementation of IT as technology are relatively easy to imitate. Moreover, competition based on IT usually triggers the response of competitors, which triggers the pace of competition. Consequently, strategies based on technological implementation have to be constantly updated in order to cope with competitors. Therefore,

competitive advantages are difficult to sustain, demanding the existence of a good strategy[184].

Having given an explanation of *competitive advantages*, the next section introduces *sustainable competitive advantages*.

8.1.3 Sustainable competitive advantages

Section 8.1 introduced 'Sustainable Competitive Advantages' as a possible outcome of the competitive process. Therefore, the aim of this section is to explain the characteristics of 'Sustainable Competitive Advantages' as competitive outcome.

The term *sustainable competitive advantage* is used when competitors do not simultaneously apply the same strategies, and when the advantage is sustainable during a certain period of time. Consequently, competitors have disadvantages and difficulties in imitating such a strategy. Barney (1991), who has discussed the sources of sustainable competitive advantages, claims that a firm has a *sustained competitive advantage* when:

> *It is implementing a value creating strategy not simultaneously being implemented by any current or potential competitor and when these other firms are unable to duplicate the benefits of this strategy.*
>
> *(Source: Barney, 1991, p. 102)*

According to this definition, sustainable strategies are those that are difficult to *duplicate*. In order to make strategies inimitable[185], the combination of several factors and capabilities are of great importance. Therefore, sustainability is more about a combination of factors in a way that it makes difficult the imitation of strategies.

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184 *See Porter (2001).*

185 *Inimitable for example, heterogenic, intangible and connected to companies' own natures.*

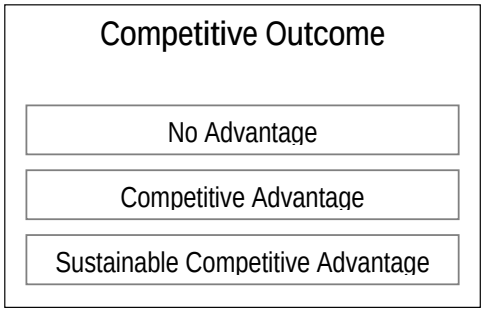
Considering IT as the basis of the advantage, a single implementation of technology does not provide sustainable competitive advantages. This is because technology as it is available to anyone may offer the same advantages to competitors that invest in the same technology. Consequently, sustainable competitive advantages owing to IT are more difficult to sustain, because they require continuous adjustments to sustain the advantage.

Having given the characteristics related to 'competitive outcome', the next section presents an analytical model.

8.1.4 Model for competitive outcome

Section 8.1 introduced the construct 'competitive outcome' with different values such as 'no advantage,' 'competitive strategy' and 'sustainable competitive strategy.' Figure 18 summarized 'competitive outcome' and its values in a framework.

Figure 18: Competitive Outcome



(Source: Developed for this thesis from Section 8.1)

Having given an introduction to the meaning of 'competitive outcome,' this chapter continues with the next section that explains 'competitive strategy.'

8.2 Competitive strategies

Section 6.3 introduced competitive strategy as a factor related to strategic management, and Section 7.3 as a factor related to the competitive environment. Therefore, the aim of this section is to introduce the importance of competitive strategy and identify the relation between factors that can be used to explain the framework.

The term *Competitive Strategy* is often used in MS research as a synonym for 'Corporate strategy' and vice versa. The definition of Faulkner et al. (2003) is used in this thesis as the basis for the analysis of competitive strategies. According to Faulkner:

> *Competitive strategy is about finding a strategy that is better than that of your competitors, and that thus enables you to make repeatable profits from selling your products and services.*
>
> *(Source: Faulkner et al., 2003, p.12)*

Faulkner et al. (2003) relate competitive strategies to the concept of market[186]. This definition is representative because it includes factors such as environment, strategies and competitive factors[187]. Moreover, the definition also emphasizes the importance of identifying the competitive environment as a preliminary activity for competitive strategies.

Having given a definition for competitive strategies, this section continues by describing the process of developing competitive strategies.

8.2.1 Development of competitive strategies

Section 6.3 presented the *development of competitive strategies* as one of the roles of a strategic manager. Therefore, the aim of this section is to analyze factors to consider prior to the formulation of competitive strategies.

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186 *In this thesis the definition of market is included in the term competitive environment, See Chapter 7).*

187 *For additional examples of competitive factors see Faulkner et al. (2003).*

One factor to consider prior to the analysis of competitive strategies is the analysis of the competitive environment as introduced in Sections 6.3, 7.1, & 7.2. These sections stated that the competitive environment influences or determines the selection of competitive strategies. Therefore, in order to be competitive, an analysis of the competitive environment is needed prior to the selection of competitive strategies. Such analysis supports the identification of competitive strategies and factors that fit a specific competitive environment.

Since the combination of strategies and factors is a complex process, the development of strategies is based on the uses of generic competitive perspectives, for example economies of scale, economies of scope, etc. Consequently, in order to identify competitive perspectives, strategic managers use theories of competition as the grounds for developing competitive strategies. This is because theories of competition establish the relation between strategy, competitive factors, and their effect on competition.

Having given the importance of theories of competition, the next section introduces the characteristics of major theories.

8.2.2 Theories of competition

Section 8.2.1 introduced theories of competition as basic assumptions for the development of competitive advantages. Therefore, this section introduces several theories of competition in order to identify relationships between common factors to include in the framework.

Theories of competition are a set of assumptions that define the rules of the competition. They define the basis of the strategy and a way in which to combine factors to achieve competitive advantages. These theories are generic, and only give an understanding or guidelines to follow. Business strategies use theories of competition as a base and adapt these theories to fit the environment of the firm. Some generic theories of competition are economies of scale, economies of scope, core competence, the factor-base view theory and dynamic capabilities.

Having given the importance of theories of competition, the next section introduces major theories. This chapter continues by introducing the first given competitive strategy; economies of scale.

Economies of scale

Section 8.2.2 introduced *economies of scale* as a generic theory of competition; therefore, the aim of this section is to explain the characteristics of this theory.

In economies of scale, companies compete with lower costs than their competitors do, and therefore tend to dominate market shares. According to Christensen (2001, p. 106), in the 1960s and 1970s competitive advantages were built upon steep scale economics.

> *Steep economies of scale exist when there are high fixed vs. costs in the predominant business model. Large organizations can amortize the fixed costs over greater volumes, condemning small competitors…*
>
> *(Source: Christensen, 2001, p. 106)*

Additionally, according to Porter[188], these economies force new businesses in the competitive environment to either enter on a large scale or to accept a cost disadvantage.

Theories of scale use transaction cost theory to manage cost. According to transactions cost theory the organization of economic activity is strongly influenced by the costs of managing interactions between economic activities, including the cost of searching, negotiating and agreement, and monitoring execution of the transaction[189]. Even though, Williamson's theory has been criticized for being valid only for production within companies, the theory can be applied to the uses of IT as a strategic factor. However, the theory only

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188 *See Michael Porter, (1979, p. 138) "How Competitive Forces Shape Strategy," Harvard Business Review, March - April 1979.*

189 *See Williamson (1975).*

applies to IT as technology delivery, focusing only on static characteristics of IT as a factor.

According to economies of scale, IT is considered as a strategic factor and therefore can be applied to IT management. IT is considered as a competitive factor because it leads to the reduction of transaction cost in business processes. One example that shows how IT reduces transaction costs is found in the uses of the Internet. The uses of the Internet reduce transaction cost in several ways. One way is reducing delivery costs by facilitating interaction for actors who are inside or outside the organization boundaries, for example, the whole world. Another way to reduce cost is by making effective the delivery process, since IT can delivery more pieces of information simultaneously, for example when sending email to a group.

Moreover, the introduction of new information systems into an organization affects an organization's transactional costs. Rapp (1999, p. 190) affirms that an analysis of the cost causes is necessary to support management decisions related to the introduction of IT. This is because transaction costs theories help strategic managers to structure the problems related to cost or efficiency.

In summary, IT changes transaction costs in relation to time, and quality of information flows and decision processes. Moreover, changes in transaction cost affect strategic choices (Clemons & Row, 1991). However, advantages of lower transaction costs due to IT are not stable, since IT develops constantly, delivering each time better technologies at a lower price. Hence, within a short time competitors may with a lower investment in IT, obtain even more advantages. Therefore, competitive advantages caused by lower transaction cost as a result of using IT are limited, and may disappear soon.

According to Christensen (2001, p.107), competition based on economy of scale will no longer confer superior profits. He also believes that strategic managers need to understand causes and effects related to competitive advantages in order to avoid mistakes.

Having given an introduction to the characteristics of a competitive strategy based on economies of scale, the next section introduces the characteristics of economies of scope.

Economies of scope

Section 8.2.2 introduced *economies of scope* as another generic theory of competition. Therefore, this section explains the characteristics of economies of scope as a competitive approach.

Economies of scope are related to product-line breadth. According to Christensen (2001, p. 107) few companies are large enough to absorb the cost of developing, manufacturing, and distributing a full product line. Caterpillar[190] and the retail industry are examples of business that compete with economies of scope. In the case of the retail industry, departmental stores are used as sales portals, which sell a little of everything.

IT can also be used to compete in economies of scope. Some examples of companies that compete in scope by using IT are Amazon.com and eBay.com. However, Christensen (2001, p. 107) writes, *"once customers learn where to go to get what they need, the portal's competitive advantages of scope become a disadvantage…[therefore] … the portal's current advantages may be transitory."*

Having given an introduction to the characteristics of a competitive strategy based on economies of scope, this section continues by introducing the characteristics of another competitive strategy; core competence.

Core competence

Section 8.2.2 introduced *core competence* as another generic theory of competition; therefore, this section explains the characteristics of core

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[190] *Caterpillar is a technology leader and the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines and industrial gas turbines (Source: http://www.cat.com/cda/layout?m=38028&x=7, 12 Aug 2005).*

competence as competitive strategy. This section starts by analyzing the meaning of core competence:

> *Core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies…*
> *…Core competence is about harmonizing streams of technology, it is also about the organization of work and the delivery of value…*
> *…Core competence is communication, involvement, and a deep commitment to working across organizational boundaries…*
> *…Core competence does not diminish with use [… but] are enhanced as they are applied and shared.*
>
> *(Source: Prahalad & Hamel, 1990, pp. 82–84)*

The theory of *core competence* claims that companies may develop distinctive areas of expertise in order to be competitive (i.e. Prahalad & Hamel, 1990). Expertise may be developed in any area but is most likely to be developed in critical or central areas of the company where the most *value is added* to its products. These critical central areas are called *core activities*.

For instance, the design of electronic components and circuits represents core activities for a manufacturer of electronic equipment. Another example is that for a ceramics manufacturer, core activities could be the routines and processes at the heart of the production process. An additional example is that for a software company, core competences may be in the utility of the program for users or alternatively in the high quality of software code writing they have achieved.

According to this theory, core competencies are not seen as being fixed. Core competencies should change in response to changes in the company's environment. They are flexible and evolve over time. As a business evolves and adapts to new circumstances and opportunities, so its core competencies will have to adapt and change.

Applying core competences to competitive strategies based on IT, implies that IT should focus on supporting core activities. Moreover, the IT skills of the people operating core activities should also have the skills and competence to use the technology in order to obtain maximum benefits. This means that

only investments in the best IT technology that support core activities is not enough, to gain competitive advantages due to IT. Competitive advantages can be gain only if investments are made in both IT technology and the development of IT skills.

Having given an introduction to the characteristics of a competitive strategy based on core competence, this section continues by introducing the characteristics of another competitive strategy; resource based view theory.

Resource based view theory

Section 8.2.2 introduced *resource based view theory (RBV)* as an additional generic theory of competition; therefore, this section explains the characteristics of *the resource based view theory*.

The *resource based view* theory implements strategies that exploit a firm's internal strengths, to respond to environmental opportunities (Barney, 1991). The resource based theory focuses on companies' unique combinations of internal stable factors as a source of competitive advantage. Today, this theory is accepted by many researchers[191].

However, factors are combined to leverage performance advantages in a way that the delivery process of the advantage will be inimitable. Since factors are inimitable, i.e. heterogenic, intangible, and connected to companies' own nature, it is difficult for competitors to imitate this source of competition. Consequently, strategies based on inimitable internal factors are difficult to imitate and can lead to sustainable competitive advantages. Thus, a combination of factors is the key to reaching competitive advantage. However, it is difficult to understand the connection between actions and results caused by the combination of factors. This phenomenon is explained by the concept of "casual ambiguities" (Mata, 1995).

[191] *See i.e. Barney (1986a, 1986b), Clemon & Row (1992), Eisenhardt & Martin (2000), Hall (1993), Mata (1995), Winter (1987).*

In comparison with traditional strategic theories, which have mostly focused on external factors, for example competitive positioning and competitors' threat, the resource based theory proposes a way to sustain competition by the use of internal factors. The factor-based theory provides a frame of reference for the understanding of sustainable competitive advantages. Another difference between traditional strategic theories and the resource based view is the conception of the competitive environment. Traditional theories see the competitive environment as a stable factor, while resource based theory sees the competitive environment as a dynamic factor.

Applying factor-based view theory to IT means that the value of competing with IT does not rely on technology. This is because technology can be easily imitated. Instead, to enhance the competitive advantages of this theory, IT should be integrated into the organization. The integration of IT into the organization in combination with the skills of the people using IT, is difficult to imitate, and therefore can be considered as a competitive factor according to this theory.

Having given an introduction to the characteristics of a competitive strategy based on resource based view theory, this section continues by introducing the characteristics of another competitive strategy; dynamic capabilities.

Dynamic capabilities

Section 8.2.2 introduced *dynamic capabilities* as another generic theory of competition. This section explains the characteristics of *dynamic capabilities*.

Many researchers[192] have studied dynamic capabilities. Dynamic Capabilities focus on the use of factor development processes as the main source of sustainable competition in dynamic competitive environments. The rationale behind dynamic capabilities is that if the competitive environment shifts, automatically the value of its competitive factors change, therefore factors that

[192] *See i.e. Bowman (2003), Eisenhardt & Martin (2000), Teece et al. (1997).*

are use to compete, should be continuously developed to cope with environmental changes[193].

The assumptions behind dynamic capabilities are based on resource based theories that apply to dynamic competitive environments. Some definitions of dynamic capabilities are included below.

> *The term dynamic capabilities, describes organizational processes that are designed to enable firms to adapt to rapidly changing competitive environments.*
>
> *(Source: Teece, Pisano, & Shuen; 1997)*

The definition of Teece et al., 1997 is very broad, because it includes any organizational process that is designed to cope with competition. However, one can argue that there are capabilities that may include the competitive process. Another definition to consider is the definition of Eisenhardt & Martin (2000).

> *[Dynamic Capabilities] …are the firm's processes that use factors specifically the something missing processes to integrate, reconfigure, gain and release factors- to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new factor configurations as markets emerge, collide, split, evolve, and die.*
>
> *(Source: Eisenhardt & Martin, 2000)*

In this definition Eisenhardt & Martin (2000), clearly point out that dynamic capabilities are related to organizational routine processes. Moreover, the term dynamic capability is about the combination of factors that is used to compete. However, the factors must provide some source of value in terms of strategic competition.

The value of dynamic capabilities for competitive advantages lies in the ability to develop factors in terms of integration, reconfiguration, and

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193 *See Bowman (2003, p. 425).*

acquisition or releasing[194]. Therefore, external routines may be acquired into the company to cope with competition, while other routines that no longer provide competitive value may be released. They also argue that dynamic capabilities in high-velocity markets are composed of simple, experiential, and iterative processes. Nevertheless, in high-velocity markets dynamic capabilities are difficult to sustain because it is possible that internal capabilities may collapse over time.

The application of dynamic capabilities to the strategic management of IT, implies that the value related to IT should lie in the competitive effect that may result by the combination of diverse IT factors into a business.

Having given an introduction to various competitive strategies, i.e. economies of scale, economies of scope, core competence, resource based view, and dynamic capabilities, this section continues by analyzing common strategic factors.

8.2.3 Common factors related to competitive strategies

Section 8.2.2 introduced various theories of competition. Therefore, the aim of this section is to identify common factors for competitive strategies that can be used to explain the elements of the framework.

Since the formulation of competitive strategies is based on theories of competition, an analysis of theories of competition may give common factors that describe competitive strategies.

Therefore, a meta-analysis of Section 8.2.2 was done in order to identify basic factors that describe competitive strategies. It was found that all theories of competition reviewed above relate to the same set of factors; competitive focus, i.e. theory of competition, the competitive environment, competitive factors, and competitive outcome.

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[194] *See i.e. Bohman (2003, p. 425), Eisenhardt & Martin (2000).*

Competitive environment

Section 8.2.3 presented the competitive environment as a common factor that defines competitive strategies. Therefore, the aim of this section is to summarize the results of the analysis related to competitive environment.

All theories of competition presented in Section 8.2.3 describe factors that characterize their relation to the competitive environment. Therefore, this thesis assumes that the competitive environment is an important factor when describing competitive strategies.

However, theories of competition differ in their perception of the environment. The environment may be perceived in two ways; as stable or static, or dynamic (Hidding, 2001, p. 202). In the *static* view of competition the environment is perceived as stable. This is because this view considers competition as an isolated phenomenon. In this case, there is no interaction between the environment and competitors' actions, which make the environment stable. In the *dynamic* view, the environment is considered to be continuously changing and in interaction with other factors of competition that may induce those changes.

The competitive environment affects the selection of competitive strategies. For instance, developments in the competitive environment of organizations as well as in technology (IT) urge organizations to reconsider their IT strategies, i.e. by introducing e-Business or by becoming a virtual organization[195].

Having given a summary for competitive environment, let us analyze another common factor that describes competitive strategies.

[195] *See Limburg (2002).*

Competitive focus

Section 8.2.3 presented competitive focus as a common factor that defines competitive strategies. Therefore, the aim of this section is to summarize the results of the analysis related to competitive focus.

All theories of competition presented in Section 8.2.2 describe a specific competitive focus. Therefore, this thesis assumes that competitive focus is a characteristic factor when describing competitive strategies. Competitive focus is given by the selected theory of competition. Section 8.2.2 has discussed the following competitive focus Economies of Scale, Economies of Scope, Core Competence, Resource Based View Theory, and Dynamic Capabilities.

Having given a summary of competitive focus, let us analyze another common factor that describes competitive strategies; competitive factors.

Competitive factors

Section 8.2.3 presented competitive factors as a common factor that can be used to define competitive strategies. Therefore, the aim of this section is to summarize the results of the analysis related to competitive factors.

The theories of competition also differ in their perception of competitive factors. The factors commonly used for competition are categorized as internal or external factors. While some theories of competition focus on external factors such as market positioning, others focus on internal factors such as integration, capabilities, knowledge management, and organizational learning as sources of competition.

However, the competitive advantages that can be obtained by focusing on market positions are transitory for two main reasons (i.e. Christensen 2001, p. 109). One reason is that underlying factors of competition may change. The other reason is that competitive strategies drive competitors to react with strategies that may dissipate the advantage. Therefore, there is the belief that focusing on a combination of internal factors may lead to sustainable competitive advantages.

Having given a summary of competitive factors let us analyze another common factor that describes competitive strategies.

Competitive outcome

Section 8.2.3 presented competitive outcome as a common factor that defines competitive strategies. Therefore, the aim of this section is to summarize the results of the analysis.

All theories of competitions presented in Section 8.3.2 describe a possible competitive outcome. While some theories such as economy of scale, scope, and core competence are assumed to enhance competitive advantages, other theories such as the resource based view and dynamic capabilities are assumed to enhance sustainable competitive advantages.

Table 27 summarizes findings concerning the meaning and values of these commons factors, i.e. competitive focus, competitive environment, competitive factors, and competitive outcomes.

Table 27: Relation between Competitive Focus, Competitive Environment, and Competitive Factors

Competitive Focus	Competitive Environment	Competitive Factors	Competitive Outcome	Authors i.e.
Economies of Scale	Static	Lower costs	Competitive advantage	Porter (1979)
Economies of Scope	Static	Lower manufacturing cost	Competitive advantage	Kim (1987)
Core Competence	Static/ Dynamic	Core competencies	Competitive advantage	Prahalad & Hamel (1990)

Continues

Continued

Competitive Focus	Competitive Environment	Competitive Factors	Competitive Outcome	Authors i.e.
Resource Based view Theory	Dynamic	Combination of inimitable internal factors	Sustainable competitive advantage	Barney (1986a, 1986b), Clemon & Row (1992), Eisenhardt & Martin (2000), Hall (1993), Mata (1995), Winter (1987).
Dynamic Capabilities	Dynamic	Dynamic Capabilities	Sustainable competitive advantage	Bowman (2003), Eisenhardt & Martin (2000), Teece et al. (1997).

(Source: Developed for this thesis from Section 8.2)

8.2.4 IT strategy

The increased complexity of organizations and the digitalization of industries with embedded technologies may make necessary the use of many different IT strategies to enable and support business goals. However since IT is constantly improving with sinking prices and is available to everyone, the competence in industries increases. The role of IT strategy is to adjust the technology required to achieve specific business goals. Therefore, it is important for IT managers to understand the assumptions behind IT and IT strategy, so that they can adjust their IT strategy to meet environment and business needs.

Due to the complexity of an organization, strategic goals are of a different nature, and may need a set of specific strategies. Consequently, in order to achieve complex business goals various IT factors may be needed. For instance, to achieve competitive advantages on the Internet, a company may combine various IT strategies such as e-business, e-service, and CRM strategy.

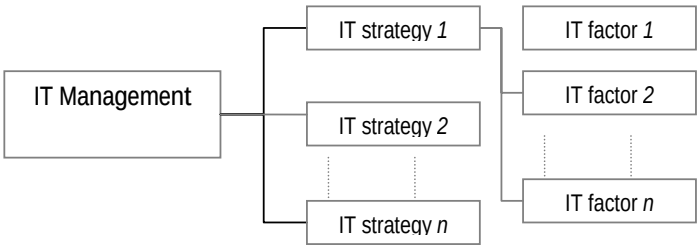
Moreover, an IT strategy, i.e. e-business, e-service, and CRM, combines different IT factors, i.e. web server, infrastructure, people skills, that must be coordinated to achieve results. Therefore, the Strategic Management of information technology (SMIT) involves the combination of several IT strategies that are related to specific IT factors in order to achieve business strategic goals. IT strategy is important for competition because industries are using more and more information technology (IT), to survive and be more competitive in markets.

The term *IT strategy* refers to strategies that manage IT as a factor in order to obtain sustainable competitive advantages. A definition of Technology strategy is found in Cardullo (1996, p. 54)

> *…a formal set of enterprise technological intentions that allocates available factors and sets priorities based on clearly stated technological and enterprise objectives and a perceived environment in which the process is to be embedded.*
>
> *(Source Cardullo, 1996, p. 54)*

In this thesis IT strategy is analyzed as a constant factor related to strategic plans or choices. IT strategy can also be defined as specific technologies needed to deliver and insure information flow such as IT architecture, technical standards, security levels, and risk attitudes. IT strategy is extremely context bound and therefore there are no common guidelines to follow. Figure 19 illustrates the relation between IT management, IT strategy, and IT.

Figure 19: Relation between IT Management, IT strategy, and IT.



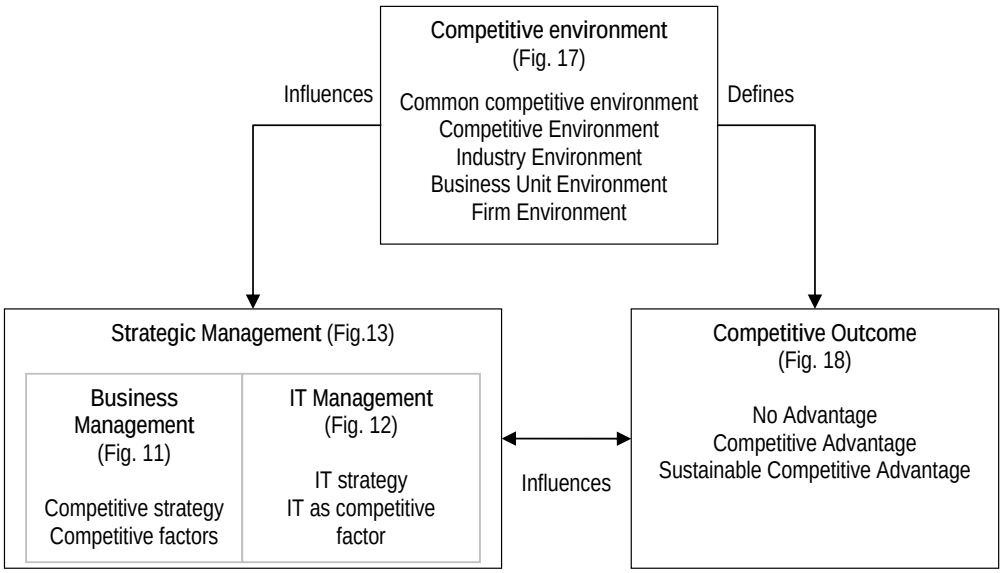
(Source: Developed for this thesis from Section 8.2.4)

8.3 Framework for competitive strategies and competitive outcome

The development of competitive strategies is a complex phenomenon because it integrates organizations' goals. Therefore, in order to cope with competitors' strategies, it is important to analyze other factors such as the competitive environment, theories of competition, and competitive factors. Competitive factors should be identified and defined, prior to the development of new competitive strategies.

Figure 20 illustrates the relation between competitive strategy, competitive environment, and competitive outcome.

Figure 20: Framework for Competitive Strategies and Competitive Outcome



(Source: Developed for this thesis from Chapter and Fig. 11, 12, 13, 17, & 18)

Figure 20 summarizes the factors, i.e. competitive strategies, the competitive environment, and competitive outcomes, presented in Section 8.2.3, and Chapters 6–7.

The relation between competitive strategies and competitive outcome is bidirectional. This is because competitive strategies are used to influence competitive outcome, and at the same time, competitive outcome is used to evaluate the effect of competitive strategies. This means that if competitive strategies are designed to achieve competitive advantages, and outcome is, for instance, no advantage, then the outcome is a measure indicating the need to adjust or change competitive strategy. The relation between business strategies and IT strategies is also bidirectional. This is because IT business strategies and IT strategies should be in alignment to achieve any result.

The relation between competitive strategies and competitive environment is also bidirectional. This is because competitive strategies influence the competitive environment. For instance, strategies that entail merging acquisitions, or exclusive business partners, changes the structure of the competitive environment by changing actors, and scale of competition. At the same time, the competitive environment influences the choices of competitive strategies, and determines in a way the selection of effective competitive factors.

The relation between the competitive environment and competitive outcome is also bidirectional, which means that they influence each other, through competitive strategies. The reason for this is that the competitive outcome motivates competitive responses of competitors, who try to balance competition. A way to balance competitive outcome is by adjusting the competitive environment, or competitive strategies. The adjustment of the competitive environment may be manifested by changing the scope of the environment, i.e. firms may chose larger or smaller markets, or by creating business networks, or associations that change the power structure of the competitive environment.

Having given a framework to represent the relation between competitive outcomes, competitive environment, and competitive strategies, the next section summarizes the results of this chapter.

Summary Chapter 8

This chapter discussed two factors; competitive outcomes, and competitive strategies in order to identify common factors and relationships in developing a holistic framework.

The first factor discussed in Chapter 8 was *competitive outcomes* (8.1). Competitive outcome was created as a construct, since it can change its values during the competitive process. Competitive outcome was discussed in terms of the following values; 'no advantage' (8.1.1), 'competitive advantages' (8.1.2), and 'sustainable competitive advantages' (8.1.3). Finally, Section 8.1.4 summarizes the results by presenting a model for competitive outcome.

The second factor discussed in Chapter 8 is '*competitive strategies'* (8.2). Competitive strategies are explained using theories of competitions (8.2.2) such as Economies of scale, Economies of scope, Core competence, the Resource based view, Dynamic capabilities. Theories of competition were used in a meta-analysis to identify common factors that describe competitive strategies (8.2.3). The common factors found are competitive focus, the competitive environment, and competitive factors. Finally, in Section 8.3 a framework that integrates the factors found in Chapter 8 is developed and included in the chapter. This framework will be further used in Chapter 10.

This chapter contributes to an expansion of the SMIT domain of knowledge by analyzing factors related to strategic management. A contribution of this chapter is models of analysis for strategic management that summarize the contents of the chapter. Finally, the framework proposed in this chapter is integrated into a final framework proposed in Chapter 10.

Having given the meaning for competitive outcome, and competitive strategy, this thesis continues with the next chapter that explains the meaning of competitive factors.

Chapter 9:

COMPETITIVE FACTORS AND THEIR RELATION TO STRATEGIC MANAGEMENT

Chapters 6–8 introduced competitive factors as related to strategic management. Therefore, this chapter explores additional competitive factors in order to identify relevant aspects of analysis. The contents of this chapter contribute to explore deeper competitive factors and IT as competitive factor. This chapter try to expand the answers to the following questions:

RQ2: Which factors are related to strategic management?

RQ3: Which characteristics are related to IT as a competitive factor?

(Source: Section 1.4)

The chapter presents two discussions. First a discussion of competitive factors in general, and second, a discussion of IT as a competitive factor.

Having given an introduction to the contents of Chapter 9, this chapter continues by explaining competitive factors.

9.1 Competitive factors

Competitive factors are also known as strategic factors, and are the factors that deliver some strategic value to an organization in terms of competitive advantages. The strategic value of competitive factors depends on the

competitive environment (7), specific theories of competition (8.2.2), and also on managers' perceptions of competitive values. There are many definitions related to competitive factors, however two relevant definitions are presented in Table 28.

Table 28: Definitions of competitive factors

Author	Definition	Discipline
Bowman (2003)	"Strategic assets [competitive factors] are specific to the firm, and they either help the firm win business, or they assist in the delivery of products or services at lower costs than competitive firms." (Source: Bowman, 2003, p. 407)	Management Science (MS)
Lucas (2005)	"[competitive factor] it is one that enables a firm to implement strategies that increase its efficiency or effectiveness" (Source: Lucas, 2005, p. 5)	Management Information Systems (MIS)

(Source: Summarized for this section from References)

As shown in Table 28, Bowman (2003) gives competitive factors a supportive role in the delivery of products or services. In others words, this means that competitive factors have to support business strategies. Moreover, competitive factors should enable competitive advantages. One can argue that competitive factors may not be specific to the firm, for example, since IT is available to anyone it is not a specific factor. However one could say that the interaction between firms and competitive factors may be used as sources of competitive advantages. In contrast, according to Lucas (2005), a competitive factor increases the efficiency or effectiveness of a competitive strategy. However, one can argue that if the competitive strategy is not adequate, the effects of increased efficiency or effectiveness are not relevant to competition.

Having giving a definition of competitive factors, the next section introduces the relations between several factors of competition.

9.1.1 Relation between competitive environment, competitive strategy, and competitive factors

As Section 8.3 has presented, competitive factors relate to strategic management (6.3), the competitive environment (7.1), and competitive strategies (8.2). This section explains in detail the characteristics of these relationships.

Analyzing the effects of the competitive environment into competitive factors one can say that during the last 20 years the evolution of the competitive environment has changed the characteristics of competitive factors. This phenomenon has been addressed by Drucker (1994) who writes, "*the importance of productive factors (land, capital, and work) will diminish while the importance of expertise and knowledge will increase."* In the knowledge society, global leading industries improve productivity by being more innovative, values effectiveness as a continuous learning process and measures competitiveness as the level of workforce's knowledge[196]. Table 29 presents a meta-analysis of the contents of Table 26, to identify characteristics for the competitive environment, competitive strategy, and competitive factors.

Table 29: Relation between Competitive Environment, Competitive Strategy, and Competitive Factors

Author	Competitive Environment	Competitive Strategy	Competitive Factors
Davis & Meyer (1998)	Blur Economy	Connectivity	Speed, connectivity, and intangibles. (Source: Davis & Meyer 1998, p. 5)

Continues

[196] *See i.e. Gomes, Aouad, & Ormerof (2002).*

Continued

Author	Competitive environment	Competitive Strategy	Competitive Factors
Capodagly et al. (2001)	New Economy	Knowledge-based relationships	Business factors ,i.e. globalization, acquisitions and consolidations, alternative channels, segmentation, deregulation, and service business dominance. Technological factors ,i.e. mobile and fixed wireless; internets, intranets, extranets; IP telephony; voice, data video convergence; distributed networking. Social factors ,i.e. 24-hour consumer, self-service access and speed, individual customization, accelerated acceptance of internet, Euro currency, convergence of work and home. (Source: Capodagly et al., 2001, p. 32)
Turban et al. (2006)	Digital Economy	Digitalization	Information Technology (Source: Turban et al., 2006, p. 4)

(Source: Summarized for this section from Table 26)

In Table 29, different values for the competitive environment, competitive strategy and competitive factors, are abstracted from the contents of Table 26.

The data presented in Table 29, also shows that the identification of the competitive environment (6.2.1) is required prior to a selection of competitive factors. This is because competitive environment values competitive factors differently. Consequently, competitive factors are only effective in enhancing competitive advantages in specific competitive environments (contingence theory). For instance, the value of the same competitive factors may vary

depending if they are used in an industry or a business environment. Moreover, in order to enhance competitive advantages, competitive factors be exploited and integrated into a firm, and imitating competitors must be avoided.

The data presented in Table 29 illustrates that the selection of competitive factors is a complex process due to the complexity of the competitive environment. The increase in complexity in the competitive process demands a higher understanding not only in the area of business and technology, but also in the way of creating social relations through technology.

Having given the importance of selecting adequate competitive factors that are in alignment with the competitive environment, the next section explains the process of identifying competitive factors.

9.1.2 Identification of competitive factors

Sections 6.2.1 & 9.1.1 have stated the need to identify competitive factors that are valuable in a specific competitive environment. Therefore, this section explains the process of selecting competitive factors.

Competitive factors can be identified in MS research by using the models developed by Porter (i.e., *the five forces model* (Porter, 1980), and the *Value Chain Model* (Porter 1985 a, p. 33-61)).

The five forces model has its origins in the field of Industrial Organization Economics, and is used to identify competitive factors in the industrial environment. The model focuses on five key forces that may determine the attractiveness of a specific industry in terms of its competitive position in the industry. The model stresses competitive dimensions related to entrants and substitutes, and suppliers and buyers. However, when competition is based on IT, and industries are connected to each other through IT portals, the identification of suppliers and competitors is not possible. Therefore, this model is difficult to apply to find IT competitive factors.

In contrast, the *Value Chain Model* developed by Porter (1985a, p. 33-61) is used to identify competitive factors in the business environment. According to

this model, every firm's value chain is composed of nine generic activities linked to each other and to the activities of its suppliers, channels, and buyers. There are two types of activities; *primary activities*, which involve the physical creation of the product, its sale and transfer to the buyer, and after sales service; and *support activities*, which support the primary activities by providing purchased inputs, technology, human factors, and various firm-wide functions. To diagnose a firm's competitive advantage, it is necessary to isolate activities with discrete technologies and economics. However, in the case of information technology, with the uses of integrated systems, for example, ERP, the isolation of discrete activities may be possible, but the valuation of intangible factors due to the integrated system may be difficult to evaluate.

However, considering competitive factors such as globalization, speed, consolidation, convergence, the application of Porters models is very difficult for several reasons. One reason is that globalization increases the level of complexity in the selection of competitive factors. Another reason is that today the competitive speed higher than before and there is less time to select or adjust competitive to cope with competitors. An additional reason is that today it is difficult to separate products from services. Consequently, the separation of activities is not possible in a competitive environment that is driven by connectivity and speed. Therefore, new research is needed to propose alternative models for the identification of competitive factors.

9.1.3 Framework for competitive factors

Section 9.1.2 presented the need to develop an alternative model for the identification of competitive factors. Therefore, the aim of this section is to introduce a model for strategic analysis of competitive factors. Considering the discussions presented in Chapters 6–8, an alternative model for competitive factors should meet several assumptions. One assumption is to analyze the alignment between all other factors of competition. Another assumption is that competitive factors should be analyzed considering strengths, threats, and the impact on the competitive environment.

Considering that the alignment between factors is important (See 6.2.5), the communication between managers becomes an important factor to consider in the strategic analysis of competitive factors. Therefore, one factor to consider in the analysis is *common understanding.*

Considering that no factor can achieve competitive advantages by itself, a construct to analyze the need to support the factor is needed in order to identify appropriate competitive strategies (6.2.2). Therefore, another factor to consider is what I call 'Complementaries.'

Considering that competition is a continuous process and competitive factors have to fit the environment (Chapter 7), another factor to consider is the 'Competitive effect.'

To sum up, focusing on these considerations, competitive factors can belong to three categories: *common understanding, complementaries, and competitive impact*. In order to understand the meaning of these chosen factors a brief description is given in the following sections, starting with 'common understanding.'

Common understanding

Common understanding is proposed as a category for competitive factors. The objective of this category is to analyze factors that may contribute or restrain competitive advantages. Examples of factors that could be considered under this category are competitive characteristics, components, etc. Since strategic managers have to deal with changes, it is important to analyze the nature of these factors. While some factors have relatively stable characteristics and do not change much over time, for example, products; other factors change constantly over time, for example, services, IT. Therefore, it seems important to consider in this category two types of factors; static and dynamic factors.

Having given the characteristics of factors related to '*common understanding,*' the next section introduces the category 'complementaries.'

Complementaries

Complementaries is proposed as another category for competitive factors. Therefore, this section explains the details of this category.

The category of *Complementaries* is related to factors *outside* the factor that are needed to increase the competitive effect. As was explained above, factors need the support of other factors to produce competitive advantages, for example, a computer requires a person with computer skills to be used as a complementary factor. Moreover, complementary factors can exist within the domain of the company or outside the company. As a strategic manager, it is important to distinguish between internal and external factors to determinate the grade of control that the firm may have over the complementary factor. Therefore, complementaries factors may be analyzed by identifying *internalities* and *externalities*. Internalities means that supportive factors are available within the domain of the firm, for example, people, capital, skills, and therefore strategic managers have some potential to manage or influence that factor. Externalities, on the other hand, refers to complementary factors that are available outside the domain of the firm, for example, industrial infrastructure, national communications, etc., and are outside the control of the strategic manager. Having given the meaning of the category '*complementaries*,' the next section introduces the category 'competitive effect.'

Competitive effect

Competitive effect is given as another category to analyze competitive factors. As chapter seven, shown the influences of environment in the selection of competitive factors may be deterministic. Moreover, the process of strategic management is a continuous process of adjustment of competitive factors and strategies to achieve competitive advantages. Therefore, it is important to include factors that make possible a continuous evaluation of a particular competitive factor in relation to the competitive environment. The competitive effect can be measured with factors such as micro and macro impact.

Having given the meaning of the three categories proposed for the strategic analysis of competitive factors, Figure 21 summarizes the results into a framework.

Figure 21: Framework for Competitive factors

Competitive Factors

Common understanding	Complementaries	Competitive effect
Static factors Dynamic factors	Internalities Externalities	Micro Macro

(Source: Developed for this thesis from Section 9.1)

Having given an introduction about competitive factors, the next section analyzes IT as competitive factor.

9.2 IT as a competitive factor

IT is an important factor to enable competitive advantages. Therefore, the aim of this section is to explore aspects that explain IT as a competitive factor.

In this section, MIS research was analyzed, and it was found that much research[197] focuses on IT as technology, and does not analyze its impact on the environment. However, much research[198] is found that does not consider the development of new IT technologies, and instead focuses on characteristics of IT that may enhance competitive advantages. While little research[199], analyzes the development of IT and the characteristics that made IT less competitive. One of the main reasons for this problem is the difficulty of predicting the future development of IT. Moreover, the frameworks seem to focus on IT as a

197 *See i.e. Henderson & Venkatraman (1999).*

198 *See i.e. Earl (1989), Henderson & Venkatraman (1999).*

199 *See i.e. Hedin & Kalling, (2002), Rapp, W. (2002).*

sufficient factor to achieve competitive advantages. Until know, little research has considered strategic management and the relation between IT and its environment. Therefore, the contribution of this section is to focus on the role of IT as a competitive factor.

The analysis of MIS research considering IT as a competitive factor reveals several patterns. Some authors[200] agree that there is a lack of understanding about IT because IT has been taken for granted and has not been researched in sufficient detail. Other authors[201] agree that there is a lack of integrating frameworks for IT management. Another pattern in MIS research is that the interaction between context and IT has been analyzed in only a few studies[202]. Additionally, the rapid development of IT has been rarely discussed in the literature related to IT management, and there is a lack of understanding of the effects of IT as a competitive factor. These patterns in MIS research reveal knowledge gaps that are important to consider in understanding how to strategically manage IT to achieve competitive advantages.

A further analysis of MIS research focusing on IT as a competitive factor reveals that there is some disagreement about the strategic importance of IT. One example is the discussion of IT as a utility or necessity instead of as a strategic resource. While most authors[203] argue for the strategic value of IT, others (i.e. Carr, 2003) argue against it. Those who believe in IT's strategic value argue also that IT is a source of competitive advantage. Carr (2003) was found among the researchers that deny the strategic value of IT. Carr (2003) compares IT with electricity, and argues that the importance of IT has diminished as well as the importance of the electricity has diminished in the past. Therefore, today, IT is conceived as a commodity and has no longer any

200 *See i.e. Mason & Mitroff (1973), Orlikowski & Iacono (2001).*

201 *See i.e. Bacon & Fitzgerald (2001, p. 46).*

202 *See i.e. Ives et al. (1980, p. 921).*

203 *See i.e. Besaou (1998), Earl (1989, 1992, 1993, 1994, 1999, 2000; 2001, 2003), Henderson & Venkatraman (1999), Chan (1999), Sabherwal et al. (2001).*

strategic value. Regarding Carr's (2003) propositions, one can argue that since two companies may use the same IT factor and obtain different results, Carr's propositions are not completely valid. The reason for this may be that Carr has only considered the content value of IT, i.e. IT as technology, and has *excluded* dimensions such as process and context in his analysis.

Today IT represents one of the most discussed factors to enable competitive advantages. While most researchers[204] consider IT as a source of competitive advantages, other researchers[205] consider IT as the second industrial revolution with the development of the Internet.

IT is a competitive factor because the developments of IT and the Internet have made possible data processing between customers, companies, and markets. Additionally, IT solves problems related to the delivery of information, lower transactions cost, fast availability in time, regardless of geographic distance, which enhances the possibility of achieving competitive advantages.

The influences of IT on the competitive environment have been analyzed by Porter & Millar (1985, p. 150) in three major characteristics. One characteristic is that IT changes the rules of competition. Another characteristic is that IT allows lower costs, enhances differentiation, and changes the competitive scope. A third characteristic is that IT allows the creation of new businesses within old ones.

Consequently the use of IT as a competitive factor, changes not only the competitive environment of business, but also of industries. In recent years, IT has also changed global competition and competition between nations[206].

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[204] *See i.e. Clemons & Row (1991), Ciborra (1994), Dehning & Stratopoulos (2003), Hidding (2001), Kalling (2000), Kanter (2003), Porter & Miller (1985), Rapp, W. (2002), Smaczny (2001).*

[205] *See i.e. Donovan (2001), Porter (2001).*

[206] *For instance, during the last years the Swedish government has invested in national infrastructure to position the country as a IT nation.*

Therefore, in order to be more competitive and increase market share companies of today require fast and updated information to compete on the market. Since both customers and competitors are connected to the Internet, companies have to consider the Internet as a strategic business factor. Additionally, use of IT as a competitive factor has increased the intensity of competition in several ways. One way is that IT broadens today's competitive scope, for example, from industry competition, to global competition. Another way is that IT increases the pace of competition, because technology is available to everyone, and competitors respond faster with competitive strategies. Another way is that the use of IT increases the development of technical infrastructures within industries. Consequently, the implementation of IT in an industry influences the work processes involved[207] and produces at the same time organizational structural changes[208]. Moreover, IT serves as an enabler for new business opportunities [209], but also produces internal organizational changes, that should be considered in strategic management.

To increase the potential to achieve competitive advantages due to IT, it is important to identify relevant characteristics related to IT as a competitive factor that may enhance or inhibit advantages.

9.2.1 Characteristics of IT as a competitive factor

Section 9.2 discussed MIS research and found a gap of knowledge in its understanding of IT. Moreover, other gaps were found pertaining to the characteristics of IT as a competitive factor. This section explores characteristics of IT that are important to consider in the achievement of competitive advantages.

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[207] *See i.e. Depickere (1999).*

[208] *See i.e. Brigham & Corbett (1996).*

[209] *See i.e. Igbaria & Guimarares (1999).*

Section 6.4.2 presented the characteristics of IT as a competitive factor that are important to achieve competitive advantages and alignment. One example of this can be seen in Table 26, in the Capodagly et al. (2001) definition of the competitive environment *new economy*. They identify competitive factors that are in alignment with the *new economy* into three areas: business, technology, and social. Related to *technological* factors Capodagly (2001) considers mobile, fixed, and wireless technologies; the Internet, intranets, extranets; IP telephony; voice, data video convergence; and distributed networking. In other words, technologies behind the Internet, network and wireless, would not be useful in competing in the *"new economy."* On the other hand, IT developments that present better functionality could also become competitive factors. Having given an example about the need to match competitive environment and competitive factors, the next section explores characteristics of IT that are important to consider in strategic analysis.

IT Characteristics

The first characteristic of IT to consider in strategic analysis is *IT characteristics.'* Considering the gaps found in prior research it is important to determine the competitive characteristics of IT. The analysis of *IT characteristics* of IT is important from a business point of view for several reasons. One reason is *to enhance communication* by reducing the confusion that many people have regarding technology[210]. Another reason is to *improve the understanding of IT management* by exploring benefits and risks related to IT as a competitive factor. An additional reason is to *improve the level of strategic alignment* by improving managers' understanding of the language and processes of IT in organizations[211]. Additionally, the results of the analysis of the characteristics of IT can be used to communicate a common understanding of IT, between business and IT managers. The next section analyzes this category in order to identify relevant areas of analysis.

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210 *See Luftman et al. (2004, p. 333).*

211 *See Luftman et al. (2004, p. 334).*

Analyzing the data focusing on the characteristics of IT, two types of factors were found, *static* and *dynamic* characteristics. Static characteristics are those characteristics of IT that change at a slow pace and seem to be stable, for example, technological characteristics. Dynamic characteristics are those that change at a fast pace, for example, technological developments, and technology prices. In order to understand the rationale behind static and dynamic characteristics, they will be briefly introduced in this section.

Static characteristics

Static characteristics are related to IT characteristics that may be considered as relatively stable or with little change. According to this static view the characteristics do not change at all or change so little that one can consider the characteristics with constant values. Examples of static characteristics can be definitions, IT components, and competitive factors of IT.

A *definition of IT* is used in the strategic analysis to explain the meaning of IT and to create a common understanding of IT as a competitive factor. The meaning of IT can be described in terms of the etymology and origin of the word, explaining the processes involved with IT.

The *components of IT*, analyze and describe the components of IT, and also explain how the parts fit together. This characteristic contributes to creating a common understanding of IT.

The *competitive characteristics* are characteristics of IT that affect competition. Since MIS research mostly focuses on characteristics of IT that enhance competition, i.e. low transactional cost, fast delivery, it is important to include characteristics that may restrain competition, for example, uncertainties. This is important because in order to manage IT effectively, it is necessary to understand factors that may restrain the effects of IT in competition.

Dynamic characteristics

The dynamic characteristics relate to change and the dynamic part of strategic management. This category includes dynamic characteristics of IT

changes in which may affect competition, for example, changes in technology scope, functionality, price, and availability.

It is important include this characteristic in the analysis because much IT research considers only static factors of IT and excludes the analysis of IT changes, denying the evolution of the technology. However, the consideration of IT developments is important for strategic analysis, since these developments affect not only industrial processes, but also competition, and markets. This is a challenge for strategic management for several reasons. One reason is that it makes difficult the formulation of long-term strategies for IT. Another reason that challenges the strategic management of IT is the difficulty to predict the impact of new IT developments on the competitive environment. This is because new IT developments may increase the use of IT in business, which might affect the competitiveness of the firm.

Having given an introduction about *characteristic of IT* as a competitive factor, the next section introduces another characteristic for the analysis of IT as a competitive factor called *complementaries*.

Complementaries

Focusing on the fact that IT alone does not achieve competitive advantages, another characteristic to include in strategic analysis is '*Complementaries*'. This category considers resources outside IT that are needed to assure or increase the impact of IT on competition. *Complementaries* may enhance or restrain the impact of IT. This category is designed to include two types of complementaries 'internalities,' and 'externalities.'

Internalities

Internalities refer to characteristics outside IT that can be found in the organization and which strategic management may control or influence. Examples of internalities may be data skills training, knowledge sharing, information sharing, and capabilities.

Externalities

Externalities refer to characteristics outside IT that are beyond the influence of strategic managers. Some externalities may increase the impact of IT, for example, network externalities, industry infrastructure. Other externalities may limit the impact of IT, for example, changes in the competitive environment, global conjuncture.

Having given the meaning of '*complementaries*,' this section introduces another characteristic for the strategic analysis of IT called *'competitive effect.'*

Competitive effect

Competitive effect relates to characteristics that can indicate the level of impact of IT. For instance, some examples of competitive effect characteristics are micro and macro effects. While an example of micro effect focuses on the quick delivery of information within an organization, a macro effect would focus on the delivery of information to the industry or the globe.

Having given an explanation of relevant characteristics of IT as competitive factor, the next section summarizes these results in a framework.

9.2.2 Framework for IT as a competitive factor

Section 9.2.1 introduced several characteristics to consider in the strategic analysis of IT. Therefore, the aim of this section is to summarize those results into a common framework. Figure 22 summarizes the results of Section 9.1.3 and Section 9.2.1 into a framework for the strategic analysis of IT.

Figure 22: Framework for IT as Competitive Factor

IT as Competitive Factor		
IT characteristics (Factors related to IT as factor)	**Complementaries** (Factors outside of IT)	**Competitive Impact**
Static factors	**Internalities**	**Micro effects**
IT factors Competitive factors Certainties Uncertainties	People skills Capabilities Knowledge Sharing Internal alignment Technology uses	Effects within the organization
Dynamic Factors	**Externalities**	**Macro effects**
Changes in Technology Changes in Technology prices Changes in Technology availabilities	Network externalities National infrastructure Changes in the Competitive Environment	Effects outside the organization

(Source: Developed for this thesis from Section 9.1.3 & 9.2.1)

As shown in Figure 22, the process of strategic analysis is a complex phenomenon. Strategies that focus only on factors related to the characteristics of IT are easy to imitate. Combining these factors with internalities creates unique factors that are not easy to imitate. However, it is argued that strategic analysis should focus on factors that limit the impact of IT, and should thus be given much attention in a strategic analysis. Therefore, it is important to understand all factors that may limit IT enabling competitive advantages.

Summary Chapter 9

This chapter discussed the importance of competitive factors (9.1) and IT (9.2) in competition. The aim of this chapter was to analyze competitive factors

and IT in order to identify relevant characteristics to consider for a holistic framework.

Section 9.1 discusses the relation between strategy, environment, and competitive factors. The identification of competitive factors is done traditionally using Porter's models, i.e. the five forces model, and the value change. However, it was argued that these models have difficulties explaining IT.

The second section of this chapter (9.2) discussed IT as a competitive factor. As a result of the discussion in Chapters 6–8, the competitive factors were classified into three categories (9.2.1): Characteristics of IT, Complementaries, and Competitive Impact. A framework for the strategic analysis of IT as a Competitive Factor is presented in Figure 22.

Having given the importance of characteristics of competitive factors, the next chapter will integrate the frameworks presented in Chapters 6–9 into a holistic framework for the analysis of *strategic management of information technology*.

Chapter 10:

FRAMEWORK FOR STRATEGIC ANALYSIS BASED ON SMIT

Chapters 1, 2, and 6–9 have contributed towards a conceptualization of the *strategic management of information technology*. Therefore, the aim of this chapter is to summarize those findings into a holistic framework for the *strategic management of information technology*. The contents of this chapter achieve the aim proposed for this thesis

> **To develop a framework for exploring the strategic management of information technology, SMIT, in competition**

(Source: Section 1.3)

The analysis Management Science (MS) and Management Information Systems (MIS) research focusing on strategic management and IT shows two trends. First, much MS and MIS research tends to investigate either business strategies[212] or IT strategies[213] separately, while little research[214] discusses both factors. Second, IT strategy research focuses mostly on the use of IT as a source of advantages, but does not consider the interaction between IT and the competitive environment.

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212 *See i.e. Ansoff (1965), Ansoff & McDonnell (1990), Porter (1980, 1985, 1991), Whittington (2001).*

213 *See i.e. McFarlan (1984), Earl (1989, 1994, 1999).*

214 *With the exception of the work of Henderson &Venkatraman (1999), Earl (1989, 1994, 1999), Porter (2001).*

Considering that continuous changes in the competitive environment may imply changes in strategies and factors, and changes in IT influence the environment, the interactions between IT and the Competitive Environment becomes a dynamic process. Consequently, strategic management actions become more important in dynamic competitive environments. This is because strategic managers[215] have to adjust all strategies and competitive factors to be in alignment with the environment.

This chapter has five sections. First, Section 10.1 summarizes the foundations for the framework by giving a summary of relevant issues in Chapters 1–9 that are used in this chapter. Section 10.3 introduces the framework for strategic management. Section 10.4 introduces the framework for the strategic management of IT. Section 10.5 discusses the uses of these frameworks for managers.

Having given an introduction to Chapter 10, the next section presents the foundations for the frameworks developed here.

10.1 Foundations for the framework

The foundations for the framework developed in this chapter have been preliminarily explored in Chapters 1–9. Therefore, this section summarizes the contributions of Chapters 1–9 that are used as foundations for the framework developed in this chapter.

Chapters 1–9 contributed to the framework with three content categories: background, foundations, and factors. The *background* for the framework is described by the contents given in Chapter 1. The *foundations* for the framework are described in Chapters 2–5. The *factors* considered in the framework are explored in Chapters 6–9. In order to understand the specific contributions of each chapter a brief review is presented below.

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[215] *i.e. business manager and the manager of information technology.*

The contents used as *background* for the development of the framework are presented in Chapter 1 in several sections: the aim (1.3), the research questions (1.4), and the justification (1.5). Moreover, the aim and the research questions are used to evaluate the data and find some answers in relation to the framework.

The contents used as theoretical *foundations* for the framework are given in Chapters 2–5. First, Chapters 2–4 present the conceptualization of the phenomenon SMIT. The conceptualization starts with Chapter 2 which defines the phenomenon SMIT (2.5). The conceptualization continues with the identification of Management Science (MS) and Management of Information Systems (MIS) (3.4) as parent disciplines for SMIT research. Additionally, Chapter 4 investigates MS and MIS research in relation to SMIT and identifies research gaps in Section 4.3.3.

The theoretical foundations for the development of the framework are the following. Chapter 2 contributes with two relevant issues: the investigation of the domain of knowledge related to SMIT, and a definition of SMIT (2.5). Chapter 3 contributes with the identification of the research related to SMIT, and Chapter 4 with the analysis of the domain of knowledge of SMIT. Additionally, Chapter 5 introduces the methodology of the research.

The conceptualization of the *factors* included in the framework is given in Chapters 6–9. These chapters explore and identify factors and relationships to consider in the framework, and propose models and frameworks for strategic analysis. Since Chapters 6–9 give the foundations for the factors and relationships included in the framework developed in this chapter; a brief summary of their contributions is included below.

Chapter 6 contributes with two factors and two frameworks. The factors are the exploration of strategic management and the identification of relevant factors related to it, i.e. competitive environment, competitive strategies, and competitive factors presented in Chapter 6. Another contribution of this chapter is the framework for strategic management perspectives presented in Figure 13.

The contributions of Chapters 7–9 are the exploration of factors presented in Chapter 6 and the identification of characteristics for explaining these factors. A brief description of the contributions of Chapters 7–9 follows. Chapter 7 contributes with the exploration of the factor the competitive environment and the presentation of a framework for the competitive environment (Figure 17). Chapter 8 contributes with the exploration of two factors: competitive outcome and competitive strategies, and the presentation of two frameworks: one for Competitive Outcome (Figure 18) and another for Competitive Strategies and Competitive Outcome (Figure 20). Chapter 9 focuses on competitive factors and contributes with two frameworks: one for Competitive Factors (Figure 21), and another for IT as Competitive Factor (Figure 22).

Table 30 summarizes the contributions of Chapters 1–9 used for the development of the framework presented in this chapter.

Table 30: Contributions of Chapters 1–9 to Chapter 10

Part I: Foundations for the Research			
Research Issue	**Chapter**	**Analysis**	**Tables, Models and Frameworks**
Background (Chapter 1)	Chapter 1	Aim (1.3) Research questions (1.4) Justification (1.5)	Research Issues (Table 2)

Continues

Continued

Part I: Foundations for the Research			
Research Issue	**Chapter**	**Analysis**	**Tables, Models and Frameworks**
Conceptualization of the phenomenon SMIT (Chapter 2)	Chapter 2	Definition of Strategic Management of Information Technology (2.5)	Definitions of Strategy (Table 3). Definitions of Management from the perspective of MS (Table 4). Definitions of Management from the perspective of MIS (Table 5) Definitions of Information (Table 6). Definitions of Knowledge (Table 7). Definitions of Technology from the perspective of MS (Table 8). Definitions of Information Technology from the perspective of MIS (Table 9).
Identification of theoretical data sources	Chapter 3	Identification of Parent Disciplines for SMIT research (3.4)	Research Issues and Disciplines (Table 10). Parent Disciplines for SMIT Research (Table 12).
Research settings	Chapter 4	MS and MIS research in relation to SMIT (4.1–4.3)	Gaps in MS and MIS research in relation to SMIT (Table 15)

Continues

Continued

Part I: Foundations for the Research			
Research Issue	**Chapter**	**Analysis**	**Tables, Models and Frameworks**
Methodology	Chapter 5	Research design (5.2) Research focus for SMIT in this thesis (5.2.1) Research biases (5.6)	Digital libraries used in the selection of theoretical data sources (Table 17). Selection of Journals (Table 18). Keywords used in the selection of articles (Table 19). Research focus for SMIT in this thesis (Figure 8)
Part II: Analysis and Results			
Research Issue	**Chapter**	**Analysis**	**Tables, Models and Frameworks**
Conceptualization of the framework SMIT (Chapter 6–9)	Chapter 6	Factors related to Strategic Management (6.3)	Relation between Part I and Part II (Table 21). Strategic Management definitions (Table 22). The role of Strategic Management (Table 23). Characteristics of strategic management (Table 24). The role of the IT manager (Table 25). Framework for Strategic Management Perspectives (Figure 13), Framework for Strategic Management roles and factors (Figure 14)

Continues

Continued

Part II: Analysis and Results			
Research Issue	**Chapter**	**Analysis**	**Tables, Models and Frameworks**
	Chapter 7	Competitive environment, (i.e. factors and relationships) (7.1–7.3)	Characteristics of the changing environment (Table 26). Framework for the Competitive Environment (Figure 17)
Conceptualization of the framework SMIT (Chapter 6–9)	Chapter 8	Competitive outcome (8.1)	Framework for Competitive Outcome (Figure 18)
		Competitive Strategy (8.2) Common Factors related to Competitive Strategies (8.2.3)	Relations between Competitive Focus, Competitive Environment, and Competitive Factors (Table 27)
		Competitive Strategy and Competitive Outcome (8.3)	Framework for Competitive Strategies and Competitive Outcome (Figure 20)

Continues

Continued

Part II: Analysis and Results			
	Chapter	**Analysis**	**Tables, Models and Frameworks**
	Chapter 9	Competitive Factor (9.1)	Definitions of Competitive Factors (Table 28). Relation between Environment, Competitive Strategy, and Competitive Factors (Table 29). Framework for Competitive Factors (Figure 21)
		IT as Competitive Factor (9.2)	Framework for IT as Competitive Factor (Figure 22).

(Source: Summarized for this section from Chapters 1–9)

Having given a summary of the contributions of Chapters 1–9 to this chapter, the next section continues by introducing a framework for strategic management.

10.2 Framework for strategic management

Section 10.1 summarized the results of Chapters 1–9 that are used for the development of the framework presented in this chapter. Therefore, this section indicates the factors considered for a framework based on strategic management.

This section has four parts: the basic assumptions (10.2.1), factors included in the framework (10.2.2), the framework for strategic management (10.2.3), and the relevance of the framework (10.2.4). Having given an introduction, the next section introduces the analysis.

10.2.1 Basic assumptions

The results of Chapters 6–9 were analyzed to identify factors to include in the holistic framework. One major assumption for the analysis is that strategic management is essential in achieving the competitive advantages of IT (1.1). Therefore, strategic management is the focus of the strategic analysis and all factors related to strategic management are considered in the analysis. Another assumption is that competition is an ongoing process that includes several factors. Having given the assumptions considered for the development of the framework, the next section introduces a framework for strategic analysis based on strategic management's actions.

10.2.2 Factors included in this framework

Section 10.2 has given a summary of relevant factors presented in Chapters 6–9 that are considered in Chapter 10. This section integrates some of those factors to propose a framework for Strategic Management.

The factors selected for the framework satisfy the following conditions: the aim (1.3), the research questions (1.4), and their relation to strategic management, i.e. the competitive environment, competitive strategies, and competitive factors as discussed in Chapters 6–9. The competitive environment changes continuously (7.2) and may affect the choices of competitive strategies and competitive factors (7.3). Therefore, changes in the competitive environment produce changes in competitive strategies and competitive factors. Consequently, the role of strategic management is continuous learning and evaluation of competitive strategies and factors in relation to the competitive environment.

Since relevant SMIT factors have already been discussed and explored in Chapters 6–9, the aim of this section is to identify factors to consider for strategic management, and relate those to the places in this thesis that further explain these factors. The frameworks integrated into this section are: the framework for Strategic Management Perspectives (Figure 13), the framework for the Competitive Environment (Figure 17), the framework for Competitive

Outcome (Figure 18), the framework for Competitive Strategies and Competitive Outcome (Figure 20), and the framework for Competitive Factors (Figure 21). Table 31 summarizes these contributions.

Table 31: Contributions of Chapters 6–9 to the Framework for Strategic Management

Competitive Factors	Characteristics	Related to	Tables, Frameworks
Strategic management (Chapter 6)	Business Management (6.4.1) IT Management (6.4.2)	Competitive environment, Competitive Advantages Competitive Strategies, and Competitive Factors.	Relation between Part I and Part II (Table 21). Strategic Management definitions (Table 22). The role of Strategic Management (Table 23). Characteristics of strategic management (Table 24). The role of the IT manager (Table 25). Framework for Strategic Management Perspectives (Figure 13), Framework for Strategic Management roles and factors (Figure 14)
Competitive environment (Chapter 7)	Common environment, Industry environment, Business environment, Firm environment (7)	Strategic Management, Competitive, Competitive outcome, Strategic Management, Competitive Strategies, and Competitive factors	Characteristics of the changing environment (Table 26). Framework for Competitive Environment (Figure 17)

Continues

Continued

Competitive Factors	Characteristics	Related to	Tables, Frameworks
Competitive outcome (Section 8.1),	No advantages (8.1.1) Competitive Advantages (8.1.2) Sustainable competitive advantages (8.1.3)	Competitive environment, Strategic Management, Competitive Strategies, and Competitive Factors.	Framework for Competitive Outcome (Figure 18)
Competitive Strategy (Chapter 8.2)	Competitive focus, Competitive strategy and competitive factors (8.2.3)	Competitive Environment, Strategic Management, Competitive Outcome, and Competitive Factors.	Relation between Competitive focus, Competitive Strategy, and Competitive Factors (Table 27) Framework for Competitive Strategies and Competitive Outcome (Figure 20)
Competitive factors and IT (Chapter 9)	Competitive factors (9.1)	Competitive environment, Strategic Management, Competitive Strategies, and Competitive outcome.	Definitions of Competitive Factors (Table 28). Relation between Environment, Competitive Strategy, and Competitive Factors (Table 29). Framework for Competitive Factors (Figure 21)

(Source: Summarized for this section from Chapters 6–9)

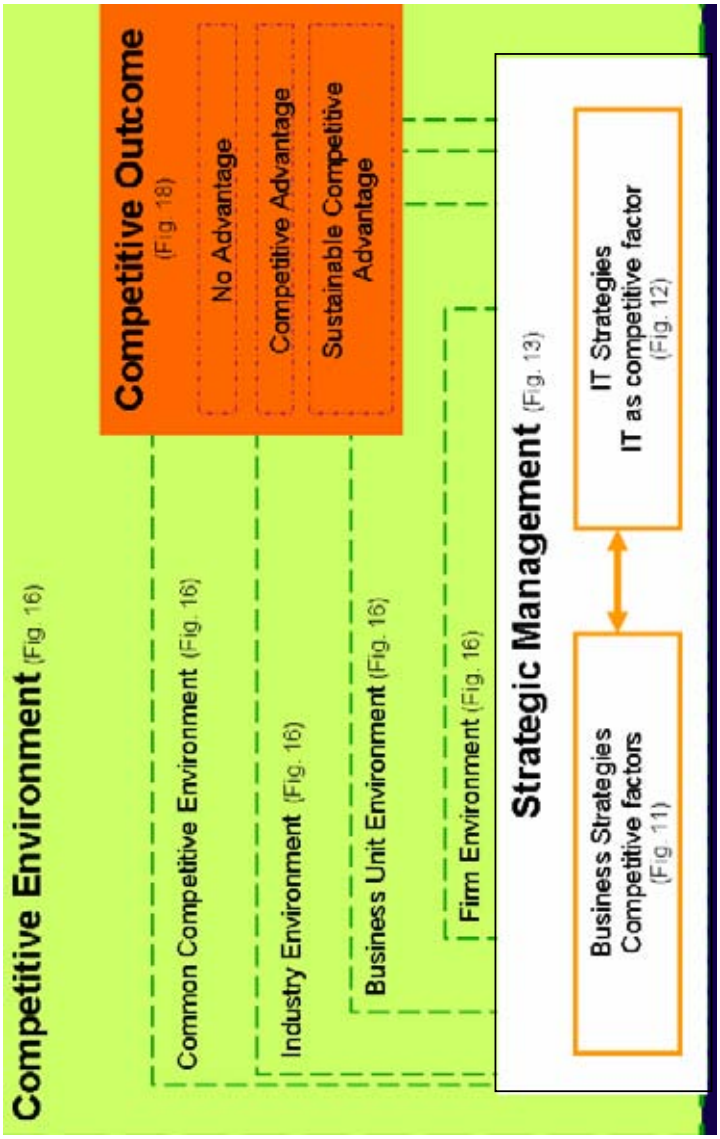
Having given a summary of the frameworks integrated into this section, the next section introduces the assumptions behind the integration.

10.2.3 Framework for strategic management

Having given the assumptions (10.2.1) and factors (10.2.2) for this framework, this section integrates these into a holistic framework for strategic management.

The factors considered in this framework are presented in Table 32 and can be summarized in three major factors: Competitive Environment (7), Competitive Outcome (8.1), and Strategic Management (6). Figure 23 (See next page) proposes a holistic framework to explore the relations between these factors.

Figure 23: Framework for Strategic Management



(Source: Developed for this thesis from Chapters 6–9)

In order to understand the rationale behind the framework for Strategic Management presented in Figure 23, the next section describes the considerations behind each factor.

Competitive environment

The factor *competitive environment* (7) is included in the framework as the context in which competition occurs. Therefore Figure 23 illustrates competitive environment as a major factor that affects all others factors in competition. Figure 23, also shows that Competitive Environment may include several levels for the strategic analysis of the environment[216] (See Chapter 7). Competitive environment levels of analysis included in the framework are: the common competitive environment, the industry environment, the business unit environment, and the firm environment (See 7.1.2). These different environment levels are illustrated as embedded in each other because they influence each other. For example, one characteristic of the common competitive environment may be a global economical recession, which affects the industry, business and firm environments.

The competitive environment also influences the development of competitive strategies and limits the choices of strategic management and determines the competitive outcome (See Chapter 7). Moreover, the competitive environment affects the outcome of competition.

Considering that the competitive environment plays a central role in competition, changes in the structure or conditions of the strategic environment affect the actions of strategic managers and the competitive outcome. Therefore, much time of strategic analysis should be dedicated to analyze how changes in the competitive environment may affect the organization. After the analysis of the strategic environment, strategic

[216] *See Pitkethly (2003).*

managers may develop competitive strategies that include their internal resources to achieve specific competitive outcomes. For further details about the characteristics of competitive outcome see Chapter 7.

Competitive outcome

The factor *Competitive outcome* (8.1) is included as the desired goal for competition. From the perspective of a strategic manager, there must exist the need to achieve a particular competitive goal before the development of competitive strategies. Therefore, the definition of this particular goal is an important factor in strategic analysis. Although, strategic managers can define which competitive goals they want to achieve, but they cannot assure that the actions they take will manifest their particular goals. This is because the competitive process is dynamic, and depends on the conditions on the competitive environment, as well as on the interaction of others competitors[217].

In strategic analysis it is therefore important to consider that there may be three possible competitive outcomes: no advantages (8.1.1), competitive advantages (8.1.2), and sustainable competitive advantages (8.1.3). Moreover the achievement of a specific competitive outcome may not be durable, and may therefore change as a reaction to changes in the environment and the actions of competitors.

In the framework for SM (Figure 23), Competitive Outcome is related to Competitive Environment in relation to: Common Competitive Environment, Industry Environment, Business Unit Environment, and Firm Environment. However, the Competitive Outcome is illustrated as outside the Firm Environment, to indicate that there is no direct relation between the two factors. This is because there is no meaning into the achievement of competitive outcomes considering only the firm as the environment, because

[217] *Considering that it is also important to analyze the impact of internal resources section 10.3 discusses IT as competitive factor as a major resource.*

there is no meaning to achieve competitive goals without competitors. For further details about the characteristics of competitive outcome see Section 8.1.

Strategic management

The factor *strategic management* is included in the framework to illustrate how strategic management is related to others factors in the achievement of competitive advantages. Chapter 6 describes how strategic management is related to factors as competitive environment, competitive outcome, competitive strategies, and competitive factors (See Section 6.3). Moreover, strategic management is related to the perspectives of business and IT managers (See Section 6.4). While *Strategic management* has a direct relation to factors such as competitive environment and the perspectives of business and IT managers, it has an indirect relation to factors as competitive outcome.

The relation between strategic management and competitive environment is direct because strategic management actions can be determined or limited by the competitive environment[218]. Additionally, strategic management actions may influence the competitive environment producing changes in the competitive outcome. Therefore, strategic management is included in the framework as embedded in all levels of the competitive environment, to illustrate this relationship.

As shown in Figure 23, the relationship between strategic management and its interactions with the competitive environment may be explained as a holistic process. Since strategic management is embedded in the competitive environment, all changes in the competitive environment may affect the choices of strategic management. Although changes in the competitive environment are continuous, the effects of the changes in the selected competitive strategies and factors may vary. Therefore, the competitive

[218] *For further discussions about the influence of the competitive environment in the choices of strategic management see Chapter 7. For further details about the relation of strategic management and competitive environment see Chapter 6.*

environment with relatively small changes may be considered as stable and the framework shown in Figure 23 can be used for this analysis.

However, in dynamic environments, for example, the industry of telephone services, the analysis should consider changes in factors that are included in the strategic process. For instance, the competitive environment that surrounds strategies based on telephone services is very dynamic due to a high amount of embedded IT components. Consequently, the use of IT telephony services produces fast responses in competitors. Moreover, the fast development of telephony services technology also drives the speed of competition. In these cases, a traditional framework for static factors may not be adequate as the bases of strategic analysis. Instead, the framework should be adjusted to identify dynamic factors of the specific competitive condition in analysis. The identification of dynamic factors implies that some factors need to be evaluated at shorter intervals.

Moreover, Chapter 6 has discussed that strategic management as related to the achievement of competitive goals and outcomes. However, Strategic management has an indirect relation to competitive outcome, because its actions do not affect the competitive outcome. However, strategic management actions affect the competitive environment, which affect the competitive outcome. Therefore, strategic management is illustrated as embedded in the competitive environment, but outside the competitive outcome.

Strategic management actions are represented in organizations (6.3) by the execution strategies and the combination of competitive factors. Competitive positions can be achieved by the combination of business strategies and IT strategies, and the combination of competitive factors and IT. While business strategies are developed by business managers, IT strategies are developed by IT managers. Chapter 6 discusses the idea that the achievement of competitive advantages is only possible by the consideration the perspectives of *business managers* (6.4.1) and IT managers (6.4.2). The business manager perspective is related to business strategies and competitive factors. The perspective of IT management is related to IT strategies and IT as a competitive factor.

Therefore, the framework includes *business strategies and competitive factors,* and *IT strategies and IT as competitive factor* as embedded in strategic management. Moreover, strategic management is related to the achievement of strategic alignment (See 6.2.5), consequently changes in business strategies and IT strategies affect each other[219]. This relation has been illustrated in the framework with an arrow that points in both directions between business strategies and IT.

10.2.4 Relevance of the SM Framework

The framework presented in Figure 23 expands the domain of knowledge related to SMIT, because it focus on the analysis of strategic management factors, and because it distinguishes from prior research in several aspects that are explained below.

Although MS researchers can argue that some factors included in the framework such as competitive environment, competitive outcome, competitive strategies, are commonly found in MS frameworks, MIS researchers can argue that the analysis of those factors in relation to MIS frameworks is not usually found. However, this framework has expanded the knowledge of factors, such as competitive environment, competitive outcome, and competitive strategies by presenting alternative values to those factors[220]. Moreover the inclusion of alternative values for factors as competitive environment, competitive strategies, and competitive outcome illustrate alternative strategic scenarios that can stimulates the development of competitive strategies. The analysis of alternative scenarios can help strategic managers develop alternative strategies that can be used to cope with future

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219 *See strategic alignment in section 6.2.5.*

220 *Factors considered in this framework are: competitive environment, competitive outcome, and competitive strategies. For the factor competitive environment the following values were given: the common competitive environment, the industry environment, the business unit environment, and the firm environment. For the factor competitive outcome the values discussed were: no advantage, competitive advantage, sustainable competitive advantage. For the factor competitive strategies the values discussed were business strategies and IT strategies.*

competitive challenges. The inclusion of alternative values in framework, allows the framework to be applicable to many different scenarios and thinking, stimulating strategic thinking[221].

The framework proposed in this chapter differs from prior frameworks[222] in several aspects. One difference is that the framework embeds factors to each other instead of using arrows to indicate relationships. The factors are embedded to indicate that they are depending on each other, therefore changes in one factor affects others factors. For example, since competitive outcome depends on the responses of the competitive environment it is embedded in the competitive environment.

Another aspect that distinguishes this framework is the assumption that competitive strategies are the combination of business and IT strategies. Although this idea is not new[223], this thesis has discussed that strategic management can not exclude one of these factors. Today with the developments in IT, competition is highly depending on the implementation of IT strategies that support business strategies. Moreover, the integration of IT into the framework also proposes that competitive strategies can affect different levels in the competitive environment from the common competitive environment to the business unit environment.

Another distinction of this framework is that by focusing on factors related to strategic management, managers can easily focus on factors that affect the achievement of competitive advantages and communicate their strategies easily and effectively through the organization. By focusing on the actions of strategic managers this framework differs from traditional structural analysis which focuses on the different strategies related to the structure of the organization (i.e. business strategies, corporate strategies). By focusing on

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221 *See Minztberg (1994) for further discussions about the need to develop strategic thinking.*

222 *See i.e. Clarke (2001), Kalling (2001).*

223 *See further discussions on strategic alignment in Nilsson & Rapp (2003).*

strategic management this framework proposes that the impact of competitive strategies in combination with IT can affect different levels of the competitive environment. Considering that developments in IT have produced the development of organizations structures from traditional structures, i.e. from hierarchical to virtual organizations, the uses of this framework are relevant.

Considering the uses of IT such as Internet the boundaries of the competitive environment are getting blurred, traditional frameworks with traditional structures are not easy to apply. Instead this framework illustrates that the level of impact of competitive strategies can be much broader that the structure of the firm.

The analysis presented in this framework shows that as long as factors as the competitive environment and IT develop, it is necessary to propose new frameworks of analysis.

Having given a framework for Strategic Management (Figure 23), the next section introduces a framework for the Strategic Management of IT.

10.3 Framework for the Strategic Management of Information Technology

Section 10.2 introduced a framework for strategic analysis based on strategic management. This section expands that framework to consider the strategic management of information technology.

This section includes four discussions: basic assumptions (10.3.1), factors included in the framework (10.3.2), and the framework (10.3.3), and the relevance of the SMIT framework (10.3.4). Having given an introduction to the contents of Section 10.3 next section (10.3.1) presents an analysis of the development of the framework.

10.3.1 Basic assumptions

This framework was developed as an expansion of the framework given in Section 10.2.3. Consequently, all analytical assumptions presented in Section 10.2.1 are considered in this framework as well. However, the framework presented in this section includes characteristics of IT, therefore the analysis behind IT as a competitive factor is described below.

One major assumption behind the analysis is the consideration that IT as a competitive factor is not sufficient to achieve competitive advantages. Therefore, in order to achieve competitive advantages other strategic characteristics outside IT should be analyzed. Another assumption is that IT developments accelerate the speed of competition (1.1) therefore; the continuous evaluation of IT competitive characteristics is required in order to obtain any competitive results. Moreover, changes in technological scope demand the consideration of characteristics that measure the level of impact on the competitive environment. A deeper analysis about the characteristics óf IT as competitive factor is given in Section 9.2.

Having given the basic assumptions for the analysis behind the framework, the next section presents an integrative framework.

10.3.2 Factors included in the framework

Having given the basic assumptions (10.3.1) for the SMIT framework, this section describes the selection of the factors included in the framework.

As section 10.3.1 describes the framework presented in this section combines 2 framework presented before. The frameworks combined are the framework for strategic management (Figure 23), and the framework for IT as a Competitive Factor (Figure 22). This section integrates both frameworks into a holistic framework for SMIT.

Considering that the framework presented in this section is an extension of the framework presented in section 10.2.2, this section will only described the factors considering in this extension. The framework for Strategic Management

(Figure 23) has been extended with the framework for IT as Competitive Factor (Figure 22).

The aspects related to the framework for IT as Competitive Factor (Figure 22) have been presented in Section 9.2 as IT characteristics, complementaries, and competitive effects.

Table 32 summarizes the relations between those factors, indicating the sections in this thesis that discusses those factors.

Table 32: Contributions of Chapters 6–9 to framework 10.3

Competitive	Factors	Related to	Tables and Frameworks
Strategic management (Chapter 6)	Business Management (6.4.1) IT Management (6.4.2)	Competitive environment, Competitive Advantages Competitive Strategies, and Competitive Factors.	Relation between Part I and Part II (Table 21). Strategic Management definitions (Table 22). The role of Strategic Management (Table 23). Characteristics of strategic management (Table 24). The role of the IT manager (Table 25). Framework for Strategic Management Perspectives (Figure 13)

Continues

Continued

Competitive	Factors	Related to	Tables and Frameworks
Competitive environment (Chapter 7)	Factors presented in Section 7.1.1: Common environment, Industry environment, Business environment, Firm environment	Strategic Management, Competitive Outcome, Strategic Management, Competitive Strategies, and Competitive factors	Characteristics of the changing environment (Table 26). Framework for Competitive Environment (Figure 17)
Competitive outcome (8.1), Competitive Strategy (8.2)	No advantages (8.1.1) Competitive Advantages (8.1.2) Sustainable competitive advantages (8.1.3)	Competitive Environment, Strategic Management, Competitive Strategies, and Competitive Factors.	Framework for Competitive Outcome (Figure 18)
IT as competitive factor (Chapter 9.2)	(9.2.1–9.2.2) Common Understanding , Complementaries Effects in competition	Competitive Environment, Strategic Management, Competitive Outcome, and Competitive Factors.	Framework for IT as Competitive Factor (Figure 22).
Framework for Strategic Management (10.2)			Framework for Strategic Management (Figure 23)

(Source: Summarized for this thesis from Section 10.3)

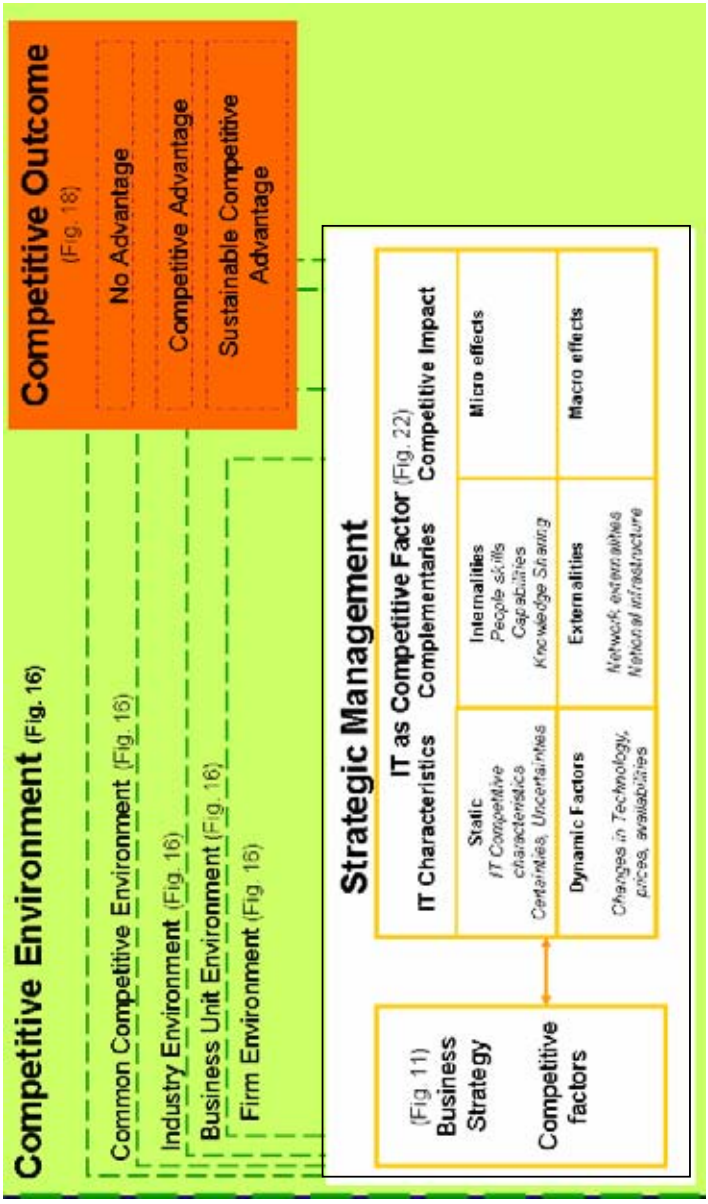
Haven given a summary of the factors included in this framework, next section presents the framework for SMIT.

10.3.3 Framework for SMIT

Section 10.4.2 introduced the factors combined into this framework as those represented in Figures 22 & 23. Therefore, the aim of this section is to integrate both figures into a holistic framework for the strategic management of information technology.

The framework for SMIT is an expansion of the framework for Strategic Management presented in Figure 23. The framework for Strategic Management (Figure 23) has been extended with the framework for IT as a Competitive Factor (Figure22) into a framework for SMIT. Figure 24 (See next page) illustrates the framework for SMIT.

Figure 24: Framework for Strategic Management of Information Technology



(Source: Developed for this thesis from Chapters 6–9, Figures 22 & 23)

The inclusion of factors such as competitive environment, competitive outcome and strategic management is discussed in Section 10.2.3. This section will only describe the rationale behind the aspects included for the analysis of IT as competitive factor.

IT as competitive factor

IT as competitive factor is included in the framework to illustrate aspects of IT that are important to consider in the achievement of competitive advantages. The aspects proposed in relation to IT as a competitive factor are analyzed from a strategic management perspective. According to the strategic management perspective, IT should be used to support competitive strategies, and business strategies. IT can also be used as competitive factor to increase the impact and effect of others strategies. However, in order to use IT to achieve competitive advantages, the analysis of strategic aspects related to IT as a competitive factor is required in order to develop IT strategies that can support the competitive strategies of the business organization.

Section 9.2 has discussed the idea that it is important to analyze not only characteristics related to IT but also factors outside IT that can be used to increase the impact of IT on competition. The competitive process due to IT is a complex phenomenon that is dependent on factors not only related to IT but also outside IT, and factors outside the organization. Consequently, the impact of IT on the strategic arena depends on the combination of IT, with factors outside IT but and outside the organization. Therefore Section 9.2 has discussed some strategic aspects related to IT as a competitive factor, i.e. IT characteristics, Complementaries, and Competitive impact, however the next section will briefly describe major aspects in the analysis.

IT characteristics

This category includes aspects related to IT and its ability to enable competitive advantages. In order to develop strategies it is important that strategic managers analyze and discussed IT characteristics in terms of static and dynamic characteristics.

Static IT characteristics considered in the framework are certainties and uncertainties. Certainties are for instance technological characteristics of IT that diminish transactional costs and distance. Focusing only in technological characteristics makes the strategic analysis incomplete, because it does not say any thing about the technology being appropriate for the business organization. For instance aspects as customers' acceptance, customers' trust, and adaptability can be discussed as uncertainties in the strategic analysis of IT. The analysis of both certainties and uncertainties related to IT as competitive factor increases the level of understanding in the development of competitive strategies.

Among the *dynamic* IT characteristics the framework proposes the analysis of aspects of IT that change in time. Aspects such as technology developments, falling prices, and technology availability can be considered in the strategic analysis. For instance, continuous IT developments affect the pace of competition where new technologies offer more technological advantages at lower prices than old technologies. Consequently, the role of strategic management is to analyze the technological developments of IT in relation to falling IT prices, and to identify their impact on the competitive environment. These aspects are important to be considered because changes in these aspects can easily benefit the strategies of competitors when using IT.

Complementaries

The framework includes also the analysis of Complementaries as aspects of IT as a competitive factor. Complementaries are aspects that are outside of IT but that are still needed to achieve competitive advantages. Moreover complementaries are further categorized as internalities and externalities.

Internalities are aspects outside IT that can be somehow managed by the organization. As examples of internalities the framework proposes the analysis of people skills, capabilities, and knowledge sharing. *Externalities* are aspects that are outside the control of the organization. As examples of externalities the framework proposes the analysis of network externalities, and national infrastructure. For instance, if the strategy is about the implementation of

business to business solutions (B2B) the analysis of the Internet infrastructure and the amount of business that is connected to internet is essential in order to implement these strategies.

When competition is driven by IT, the analysis of complementaries can be used to manage competitive challenges and assure competitive advantages. Complementaries as aspects can be used to balance competitive challenges and increase the competitive impact of the technology. Therefore, the role of the role of the strategic manager is to learn and evaluate competitive challenges and identify complementaries that can be used to cope with these challenges.

Competitive impact

The framework suggests the analysis of Competitive impact. The competitive impact can be analyzed by studying the impact of IT on the competitive environment. The framework suggests that competitive impact can be analyzed by examining Micro and Macro effects on competition. While *micro* focus on the effects of IT on the firm, and the business unit environment, *macro* focus on the effects of IT in the industrial and common competitive environment.

The position of IT as a competitive factor in the framework suggests that with the advances of IT today, the impact of strategies is greater than before. Moreover, technology allows both large and small companies to compete with each other within the same industries. IT allows the evolution of new organizational solutions were small companies can cooperate together and compete with larger companies. The analysis of these scenarios is of importance when competing with IT.

Having given a description of the aspects included in the framework for the strategic analysis of IT as a competitive factor, the next section continues by describing the relevance of the SMIT framework.

10.3.4 Relevance of the SMIT framework

Considering that this framework is an expansion of the framework for Strategic Management presented in Figure 23, the discussions presented in Section 10.2.4 are also relevant for the SMIT framework; therefore this section will only describe the relevance of the framework for IT as Competitive Factor.

The relevance of including IT as a Competitive Factor in this framework is the analysis of IT from the perspective of strategic management. This framework differs from prior research in the sense that it analyze not only technological aspects of IT, which is discussed in prior MIS literature, but it also analyzes the interactions between IT and others strategic aspects, i.e. complementaries, and the effects of IT on competition, i.e. micro and macro effects.

Until now, much research has discussed the implementation of IT as technology as a way to achieve competitive advantages. However, this framework suggests that the analysis of technological aspects of IT is not enough to achieve advantages, instead the analysis of aspects outside IT that can be used to increase the advantage are also important.

The aspects included in the framework for the strategic analysis of IT as a competitive factor also show that IT *per se* do not produce sustainable advantages, instead it is the combinations of IT with other factors inside or outside the organization the ones that enable the advantages.

Moreover, the inclusion of factors outside IT and the effects of IT on competition illustrate different competitive scenarios that show that IT in combination with other competitive factors can enable competitive advantages. The analysis of different IT-driven competitive scenarios may stimulate managers' strategic thinking and prepare them for coping with future competitors' challenges due to IT.

10.4 Uses of these frameworks

Section 10.2 & 10.3 presented holistic frameworks as a result of the analysis made in this thesis in relation to strategic management and information technology. Therefore, the aim of this section is to explain the uses of these frameworks for strategic management.

As Chapters 2 & 6, have shown, the interpretation of terms related to competition are usually ambiguous and may differ depending on the perspective of analysis. Consequently, in order to develop effective competitive strategies, managers need a common understanding of factors of competition and their relation to each other. Therefore, the frameworks shown Figures 23 & 24 can be used as communication tools between strategic managers during the process of strategic analysis and strategic choices.

Strategic management acts like a coordinator that adjusts its competitive strategies and factors to the needs of the competitive environment. However, strategic management has two perspectives: business and IT management perspectives. While business managers develop business strategies to compete, IT managers select and develop IT strategies and IT as competitive factor. To achieve maximal benefits, IT strategies should be in alignment with business strategies in order to produce competitive benefits. Therefore, the use of the frameworks presented in Figures 23 & 24, can be as analysis tools for the development of competitive strategies that are in alignment with each other. Moreover, this framework can make visible the cooperation of other competitive factors, i.e. complementaries, in order to achieve the competitive advantages of IT.

These frameworks are design to be used as tools for evaluation and discussions in strategic analysis. As Figures 23 & 24, have shown, competition is a complex process that combines the interaction of several relevant factors: the competitive environment, competitive strategy, competitive factors, and competitive output. These frameworks, i.e. Figures 23 & 24, make possible the explanation of complex relationships, and can therefore be used to understand the different factors of the competitive process. As Figures 23 & 24 are

currently presented, they can be used to analyze both static and dynamic strategic perspectives.

However, these frameworks do not claim to be all embracing, instead they are the basis for strategic analysis. Moreover, according to the contingence theory, this framework should be adjusted to fit the needs of the firm, and the competitive environment considered in an analysis. Therefore, it is recommended to expand the framework with specific characteristics that fits the firm and can be used to analyze the categories included in the framework. However, these frameworks, i.e. Figures 23 & 24, include interesting factors for the strategic analysis of IT, i.e. common understanding, complementaries, and competitive impact that can be used to discuss and evaluate the contributions of IT to the achievement of competitive advantages.

The frameworks presented in Figures 23 & 24 can be used in the stage of strategic analysis prior to the selection of competitive strategies. The framework can be used as a visual guide for strategic management to communicate manager's visions. The increased understanding of the factors included in this framework may prepare strategic managers for understanding the effects of changes in the competitive environment.

In order to enable competitive advantage, alignment between all strategies is required. However, due to the growth of companies and industries, and the increased complexity of IT, alignment between competitive strategies may be difficult to achieve. Therefore, another use for the frameworks presented in Figures 23 & 24 is as tools for the achievement of strategic alignment in competition. A further analysis of the implications of these frameworks is presented in Section 11.3.

Having given different uses for the frameworks presented in this chapter, the next section introduces a summary of Chapter 10.

Summary Chapter 10

The aim of Chapter 10 in this thesis is to integrate the results of Chapters 1–9 into a holistic framework for the strategic management of information technology, SMIT.

The chapter summarizes the contents of Chapters 1–9 into three categories: *the background* for the frameworks, i.e. represented by the aim (1.3), research questions (1.4) and the justification (1.5) (Chapter 1); *the conceptualization* of SMIT phenomenon (Chapters 2–4); and the *conceptualization of the factors* included in the framework (Chapters 6–9). A summary of the relevant factors from Chapters 1 – 9 that are considered in Chapter 10 is presented in this section.

Based on the results of Chapters 6 – 9, this chapter presents two major frameworks: one based on strategic management (10.2) and another based on the strategic management of IT (10.3). These frameworks are design to be used as discussions tools for the strategic analysis of competitive strategies based on IT. The frameworks presented in Figure 23 & 24 do not claim to be all embracing; still they are designed to be adjusted to fit the specific need of the competitive situation that requires analysis. However, these frameworks can be used to explore, discuss and understand the influences of competitive factors, i.e. the competitive environment, competitive strategies, competitive factors and competitive output, on each other from the perspective of strategic management. Moreover, the framework for SMIT (Figure 24), can be used to understand the complementary factors that are needed to achieve competitive advantages of IT.

Having given explanations regarding the holistic frameworks presented in this research, this thesis continues with conclusions.

Chapter 11:

SUMMARY, CONCLUSIONS AND IMPLICATIONS

This study extends over different disciplines, i.e. MS and MIS. Factors related to SMIT are of a different nature, i.e. strategy, environment, and IT, and require different levels of analysis, i.e. scientific knowledge, discipline, and phenomenon. The identification of factors related to SMIT has been a challenge, but also an opportunity to present these findings. In Chapters 1–10, this thesis has explored MS and MIS research to find factors related to the strategic management of information technology, SMIT, and developed a holistic framework for SMIT. This section presents the summary, conclusions and implications of the research pursued in this thesis.

The contents of this chapter are divided into several sections. Section 11.1 is a brief summary of key issues presented in this thesis. Section 11.2 gives the conclusions. Section 11.3 presents the implications of this research, Section 11.4 discusses further research, and Section 1.5 that discusses the propose research design towards a doctoral dissertation.

11.1 Summary of this thesis

This thesis titled "*A Framework for the Strategic Management of Information Technology (SMIT)"* includes two major parts, I and II. *"Part I: Foundations for the Research"* is developed in Chapters 1–5, and *"Part II: Analysis and Results"* is developed in Chapters 6–10. Since the conclusions presented in this chapter are based on the contents of Part I and II, this section summarizes key issues for the research.

11.1.1 Summary Part I

"Part I: Introduction to the Research" (Chapters 1–5), introduced the theoretical foundations for the development of this thesis. Part I introduced the background, problem, and questions for the research pursued in this thesis. Although there is much research about Information Technology (IT) as a source of competitive advantage, managers still have problems getting expected benefits from IT[224]. Therefore, researchers[225] believe that the potential to achieve competitive advantages through IT resides primarily in its strategic management[226] (1.1).

Section 1.2 presented that much research considers issues such as strategy[227], and IT for competitive advantages[228]. However, less research[229] analyzes in depth the effects of different aspects of IT in competition. The analysis of IT as competitive factor and its effects in competition is relevant for managers who wish to obtain benefits from IT investments, and for those managers who use IT to achieve competitive advantages. Consequently, in order to use IT as a source of competitive advantages the analysis of IT from a strategic management perspective is required.

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224 *For further details see Computer Science Corporation (2001, Overview, p. 3).*

225 *See i.e. Andreu & Ciborra (1996), Ciborra (1994), Clemons & Row (1991), Earl (1989), Kanter (2003), Porter (2001), Porter & Miller (1985).*

226 *Although all researchers agree that the strategic management of IT may be the solution to the problem, no common explanations of the meaning of SMIT were found in the literature reviewed for this thesis.*

227 *See i.e. Barney (1991), Bowman (2003), Clemons & Row (1991), Christensen (2001), Eisenhardt & Martin (2000), Hall (1993), Mata (1995), Minztberg et al. (1999), Porter (1979,1985,1991,1996, 2004), Prahalad & Hamel (1990),Winter (1987).*

228 *See i.e. Bocij et al. (2003), Boddy et al. (2002), Chandler et al. (1999), Lucas (2005), Luftman et al. (2004), McKeen & Smith (2004).*

229 *Example of this type of research can be found in i.e. Clarke (2001), Kalling (1999), Mata (1995), Porter (2001).*

The aim of this thesis is "*to develop a framework for the strategic management of information technology"* (1.3). To achieve this aim, three supportive research questions were proposed in Section 1.4 (RQ1–3) for identifying factors[230] to include in the framework.

Having given the research issues, Chapter 2 investigated the meaning of SMIT and proposed a definition of SMIT (2.5). According to the definition, SMIT is related to IT, competitive advantages, competitive strategies, and strategy. Chapter 3 analyzed these issues and selected two disciplines; *Management Science (MS),* and *Management Information Science (MIS)* (3.4) as sources of data for this research. Chapter 4 analyzed MS and MIS research in relation to SMIT and found several patterns:

Patterns found in *MS research*: The discipline of MS is analyzed in terms of contributions to strategy research. In strategy research, relationship patterns are often shown as frameworks. Many frameworks often consider the competitive environment as stable, and consequently environmental changes are not explicitly analyzed. Strategy research often does not consider the strategic analysis of IT.

Patterns found in *MIS research:* Analyzing MIS research from the perspective of its contribution to IT, IT Strategy, and IT management several patterns were observed. IT research has shown the following patterns. First, IT is researched mostly in terms of factors that enhance competition. Second, IT is considered in a vacuum without interaction with the competitive environment. And third, IT has been considered as static, and the impact of IT changes was not found in IT management literature. Much MIS research focuses on characteristics of IT for achieving competitive advantages without exploring the relation between strategic management and IT.

Having given the analysis of theoretical sources in Chapter 4, Part I continues with Chapter 5 that introduced the methodology used in this

[230] *Factors refer to objects to study*

research. The methodology was a qualitative analysis with theoretical data sources, i.e. MS and MIS research, and it was performed on several analytical levels. On the first level of analysis, this thesis identified scientific knowledge related to SMIT (Chapter 2). On the second level of analysis (Chapter 3), this thesis identified scientific disciplines related to the domain of knowledge presented in Chapter 2. On this level, parent disciplines for SMIT research were identified as Management Science (MS) and Management Information Systems (MIS). Chapter 4 continued at another level of analysis, and explored research in these parent disciplines (Management Science, and Management Information Systems). Chapter 4 also analyzed research in terms of contributions to SMIT, with the aim of identifying factors for the understanding of SMIT (See Section 4.3).

To sum up, Part I defined the phenomenon under study as the *strategic management of information technology,* and the contributions of this thesis to the area of Strategic Management. The research method that applied to this research it was qualitative with theoretical data sources.

The contributions of Part I are described as follows: The first contribution is found in Chapter 1 and is given as the research problem, aim, and the research questions. Chapters 2 – 4, explored the theoretical foundations of the research problem. Chapter 2 defined research issues related to SMIT such as strategy, strategic management, management, and IT, and proposed a definition of the SMIT phenomenon. Chapter 3 identified Management Science (MS) and Management of Information Systems (MIS) as leading disciplines for SMIT research. Chapter 4 analyzed MS and MIS research and evaluated the contributions of the research in relation to SMIT, identifying gaps in the research. Chapter 5 introduced the methodology used in this research.

Having given a summary of the contents of Part I, the next section summarizes Part II.

11.1.2 Summary Part II

"Part II: Analysis and Results" (Chapters 6–11), introduced the analysis and results of this thesis. While Chapters 6–9 provided the analysis, Chapter 10 proposed the framework for SMIT, and Chapter 11 provided the conclusions.

Chapters 6–9 explored factors related to the strategic management of information technology (SMIT). Chapter 6 explored strategic management, identifying factors related to strategic management such as the competitive environment, competitive strategies, and competitive factors. Chapters 7–9 explored these factors further, in order to identify characteristics for each factor that can be used in a strategic analysis. Chapter 7 explored the factor *competitive environment* and found that it can be analyzed by identifying the competitive environment, the industry environment, the business environment, and the firm environment. Chapter 8 explored the factor *competitive strategy* and identified the relationship between the competitive environment, competitive strategy, and competitive factors. Chapter 9 analyzed the *competitive factors and IT* and found characteristics for those factors to consider in a strategic analysis.

Finally, Chapter 10 integrated the factors explored in Chapters 6–9 into a holistic framework for the *strategic management of information technology*. The framework is designed to be used in the process of strategic analysis before the formulation, development, and selection of competitive strategies. The major contribution of this framework relies on the strategic analysis of the relationship between the factors included in the framework. The understanding of these relationships between these factors is fundamental to the strategic management of information technology.

Having given a summary of the contents of Part I and II, the next section summarizes the conclusions of this thesis.

11.2 Conclusions

In Chapters 1–10, this thesis presented research issues, theoretical foundations, and answers. The conclusions proposed in this section were

produced by combining research issues (Chapter 1) and answers (Chapters 6–10) in the context of the theoretical foundations given in Chapters 2-4. The aim of this section is therefore to position the results of this thesis in relation to prior research.

This section is presented in four sub-sections. First, sub-section 11.2.1 gives conclusions to the supportive research questions. Second, sub-section 11.2.2 presents conclusions related the research questions. Sub-section 11.2.3 presents conclusions related to the aim. And finally Sub-section 11.2.4 positions this thesis in relation to prior research. Having given an introduction to the presentation, the next section gives the conclusions to the supportive research questions.

11.2.1 Conclusions to the research questions

Section 1.4 proposed three research questions (RQ1–3) for this research; this section gives the conclusions to these questions, starting with RQ1.

RQ1: What is the role of strategic management in competition?

The role of the strategic management in competition is primarily related to the achievement of competitive advantages. The achievement of competitive advantages by strategic management is possible owing to three roles, selection and evaluation, management change, and strategic alignment. Strategic management selects and evaluates the competitive environment, competitive strategies, and competitive factors that enhance competitive advantages (6.3). Moreover, strategic management is in charge of the management of change and alignment between these factors, i.e. the competitive environment, competitive strategies, and competitive factors, in order to sustain the advantage.

In the past, competitive advantages could be achieved by focusing on business strategies and without considering IT. However, today IT is required to achieve competitive advantages. Therefore, the achievement of competitive advantages demands the consideration of two perspectives; business management, and IT management. While the perspective of business

management focuses on the development of the business for the achievement of competitive advantages, IT management focuses on the uses of IT as a medium to achieve competitive advantages.

Considering this, the primary role of strategic management is the achievement of competitive advantages, the consideration of both perspectives, i.e. business management and IT management perspectives, is essential for strategic management. Until now MS and MIS research[231] has focused on business management or IT management as separate perspectives. However, the skills of business managers in IT are not sufficient to develop competitive strategies based on IT. In contrast, the business skills of IT managers are not sufficient to develop strategies that may benefit the business. Gaps in the understanding of each perspective can lead to the selection of less competitive choices. Therefore business managers need to expand their knowledge with IT skills while IT managers need to expand their knowledge with business skills.

Being IT a competitive necessity that increases the peace of competition, it is important that strategic managers understand both business and IT in order to select appropriate strategies. Therefore, strategic managers, instead of focusing on business management or IT management as separate perspectives, should focus on strategic management as a competitive perspective. This is because, today, the role of strategic management includes both business and IT management. Among the similarities between the roles of strategic management, business management, it was found that; all managers develop strategies that may enhance competitive advantages, all managers are concerned with management change and the achievement of strategic alignment in order to develop strategies that may benefit the firm.

Having given the conclusions to RQ1, the next section presents the conclusions to RQ2.

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231 *See i.e. Mintberz (1994, 1998), Peteraf (1993), Porter (1985) as examples of MS research that focus only on business perspectives.*

RQ2: Which factors are related to strategic management?

The role of strategic management was explored and it was found that it is concerned with activities such as identification of the competitive environment, identification and development of competitive strategies, identification of competitive factors, management change, and the management of strategic alignment. Focusing on these activities, strategic management roles are selection and evaluation, management change and alignment of strategic factors. Consequently, strategic management factors are the competitive environment, competitive strategies, and competitive factors. Figure 16 showed the relations between these environments. Therefore factors found in each environment should be managed considering two conditions of change and strategic alignment in order to achieve any competitive advantages. The next section gives conclusions about the factors related to strategic management.

Competitive Environment

A major factor related to strategic management is the Competitive Environment (Chapter 7). The consideration of the competitive environment as a strategic management factor is essential, because competitive advantages are not possible in a vacuum. This is because competition needs competitors in order to make sense, and competitors exist only in relation to a competitive environment. The competitive environment relates to competitive strategies, competitive factors, and competitive outcomes. The competitive environment determines the selection of competitive strategies and competitive factors, and the competitive outcome, i.e. no advantage, competitive advantage, or sustainable competitive advantages. The competitive environment influences competitive strategies and competitive factors at several levels. The levels identified were the 'Common Competitive Environment,' the 'Competitive Environment,' the 'Industry Environment,' the 'Business Unit Environment,' and the 'Firm Environment.'

The competitive environment changes constantly. However, the pace of change can be perceived as stable or as dynamic. A slow pace of change is

considered as stable, and a high pace of change is considered as dynamic. In order to achieve alignment the strategic manager needs to adjust the pace of selection and evaluation of competitive factors to the pace of change.

Competitive Strategies

Another factor related to strategic management is Competitive Strategies (8.2). Strategic management is concerned with the selection, evaluation, management, and alignment of competitive strategies that may enhance competitive advantages. Although there are many generic competitive strategies, each strategy is related to a set of basic assumptions that may lead to positive results, i.e. competitive advantages. Therefore, strategic management considers these assumptions in order to align competitive strategies to the needs of the competitive environment.

Competitive Factors

Strategic management is also related to Competitive Factors (Chapter 8), which are responsible for enabling advantages. As a strategic manager, the consideration of opportunities and pitfalls are important in the analysis of competitive factors. IT is a major competitive factor today, but there are many possibilities and pitfalls in relation to its use as an enabler of competitive advantages. While the possibilities are well investigated in prior literature, research into the pitfalls related to IT management is rarely found. Both possibilities and pitfalls may be related to several characteristics. As an example, competitive strategies that focus on e-business as competitive factor are depending on the development of broadband infrastructure in the selected competitive environment.

Competitive factors are related to the competitive environment and competitive strategy. While competitive strategy defines the way in which competitive factors are used, the competitive environment determines the competitive value of the factors.

RQ3: Which characteristics are related to IT as a competitive factor?

The use of IT as a competitive factor is not a sufficient condition to achieve competitive advantage. However, the combination of IT with other competitive factors influences the impact of IT on competition.

The characteristics related to IT were summarized in Figure 22 in three groups: *IT characteristics, complementaries, and competitive impact*. The strategic analysis of IT is necessary to achieve alignment between competitive strategies. *IT characteristics* can be static or dynamic. While static characteristics focus specific IT technologies, the dynamic characteristics analyze the development of substitute technologies that may affect the outcomes of competition. Examples of static characteristics are competitive factors, certainties (factors that can affect the outcome of competition), uncertainties (factors that can limit the effect of competition). *Complementaries* are characteristics outside IT that can increase or diminish the impact of IT as a competitive factor. These characteristics are important to consider identifying additional competitive factors that may support IT as a competitive factor. *Competitive impact* is a characteristic related to the analysis of how IT influences the competitive environment, or the competitive outcome in competition.

11.2.2 Conclusions to the research problem

Until now, the propositions of prior research have segregated the knowledge between strategic management and IT in the research of two major disciplines; Management Science and Management Information Systems. Considering that strategic management and IT are both sources of competitive advantage, the research problem that this thesis tried to solve was to identify strategic management and IT factors in a common framework of analysis of SMIT.

The factors related to strategic management of information technology (SMIT) are; the competitive environment, competitive strategies, and competitive factors especially IT. This thesis has analyzed these factors from the perspective of MS and MIS, and proposed further characteristics to include

in the strategic analysis. A summary of how these factors are integrated into the final framework is presented below.

The competitive environment is a key factor related to SMIT. This factor is essential for competition, because competition needs competitors in order to make sense, and the competitors are found in the competitive environment. Another reason for its importance is that the competitive environment determines the selection of competitive strategies and competitive factors, and the competitive outcome, i.e. competitive advantage. The competitive environment may affect the selection of strategies at several levels, i.e. the common competitive environment, the competitive environment, the industry environment, the business unit environment, and the firm environment. However, the impact of the competitive environment on competition depends on the environment's nature. The nature of the competitive environment is related to the speed of change in the environment. If the characteristics of the competitive environment are related to few changes, the environment is perceived as stable. If its characteristics change often, the environment is perceived as dynamic. For instance, after the 1990s competitive environments have been perceived as dynamic. This is because the increasing speed of competition and diffusion competitive changes. The speed of change of the competitive environment affects the selection of competitive strategies and competitive factors at the same speed. Therefore, stable competitive environments have less impact on the selection of competitive strategies and factors than dynamic competitive environments do.

Competitive strategies, i.e. IT strategies, are another factor related to SMIT. The characteristics of the selected competitive strategies are related to different theories of competition. While some competitive strategies focus on the ability of strategic management to achieve specific market positions, i.e. external factors, others focus on the ability of strategic management to combine competitive factors, i.e. internal factors[232]. From a strategic management

[232] *See i.e. Barney (1986a, 1986b), Clemon & Row (1992), Eisenhardt & Martin (2000), Hall (1993), Mata (1995), Winter (1987).*

perspective, IT strategies are considered as related to both internal (internalities) and external factors (externalities). Therefore, IT strategy is the link to aligning competitive strategies.

Another factor related to SMIT is IT as competitive factor. The strategic manager uses IT as competitive factor to achieve competitive advantages. However, the use of isolated competitive factors, including IT, produces short periods of advantage, because competitors can easily imitate it. Therefore, in order to achieve sustainable competitive advantages, the combination of several competitive factors is more effective.

This thesis has argued that in order to use IT to achieve competitive advantages it is important to analyze IT from a strategic management perspective. According to this perspective, the actions related to the strategic management role are more important than the characteristics of IT. From a strategic manager perspective, the selection of IT as a competitive factor is determined by the needs of the competitive environment, therefore competitive environment becomes a limiting factor for IT. Additionally, the analysis of the influence of IT on the competitive environment is essential in order to achieve competitive advantages.

To sum up, the *strategic management of information technology SMIT* is an ongoing process that requires both understanding about business, environment and information technology. The selection of strategies should not only be based on IT technical factors that may enhance competition, but should also focus on the competitive characteristics of the environment.

Although *strategic management* is responsible for the choices of competitive strategies and factors, the competitive environment determines their selection. The alignment between the competitive environment and competitive strategies is an important relation to consider in strategic management. However, as shown in Chapters 6-9, strategic management, the competitive

environment, competitive strategies, and competitive factors, change constantly. Therefore, the role of SMIT is to continuous manage change and alignment between factors such as the competitive environment, competitive strategies, and IT as competitive factor. The competitive environment determines both competitive outcome and competitive strategy. Competitive strategies determine the selection of competitive perspectives and competitive factors, and the way in which they are used in competition. Although, there are many competitive strategies, each strategy is related to a set of basic assumptions that may lead to positive results, i.e. competitive advantages. However, these assumptions have to be considered in the strategic analysis before the selection of strategies. Moreover, competitive strategies are determined by the competitive environment.

This thesis has proposed a framework that integrates the research of strategic management, information technology, and the competitive environment into a framework for the *strategic management of information technology* that is presented in Figure 24.

11.2.3 Conclusions about the aim

Section 1.3 proposed the aim for this thesis as:

> **To develop a framework to explore the strategic management of information technology SMIT in competition**

This thesis has developed a framework to explore SMIT, based on the analysis of theoretical data sources in the disciplines of MS and MIS. The analysis of prior research has provided guidance in the identification of relevant factors to consider in the proposed framework. However, considering that the pace of IT development is very fast, and that the pace of research is relatively slow, it is possible that these factors need to be updated or analyzed in relation to a particular context. It is possible that the factors found are out of date and need to be renewed and adapted to the existence of new technological developments and settings. Therefore, a further analysis of empirical cases would contribute to update this framework and its factors, in a

way that could be applied to practical settings. See Section 11.5, which describes how this research can be further developed with empirical cases.

11.2.4 Conclusions about the position of this thesis

The contents of this thesis contribute to a better understanding of SMIT and the relation between strategic management, the competitive environment, and IT as a competitive factor.

Focusing on strategic management, the contributions of this thesis belong to the MS discipline. However, to position this contribution in the domain of knowledge of MS research, the contents of this thesis are evaluated in relation to the strategy paradigms presented in Table 13. This research could be positioned as a combination of the fourth (Strategic Management) and fifth (Strategic Thinking) paradigms.

To position this research in the domain of knowledge of MIS, The contributions of Chapter 9 were evaluated in relation to the paradigms presented in Table 14. Therefore this thesis can be positioned in the Sixth paradigm *multilevel paradigm*. This is because this thesis has analyzed characteristics of IT that belong to different levels and natures, i.e. IT characteristics, Complementaries, and Competitive Impact.

To sum up, MS and MIS research has given only partial answers to the *strategic management of information technology*. Therefore, instead of focusing separately from the perspectives of business and IT, both disciplines would win by focusing on strategic management and by including both business and IT analyses.

One the contribution of this thesis to SMIT research is the consideration of internalities and externalities as characteristics related to IT in a strategic analysis. Until now, MIS research has analyzed IT focused only on IT and has therefore considered only internal factors. However, this thesis analyzes IT from a strategic management perspective and therefore the consideration of internal and external factors is an important expansion of the MIS domain of knowledge.

The contributions of this thesis in relation to SMIT research are two: first, it increases the domain of knowledge of SMIT research, and second it integrates factors of a different nature, i.e. strategic management, competitive environment, and IT, into a common framework for strategic analysis.

This thesis has contributed to the expansion of the domain of knowledge of SMIT because it identifies factors from two different disciplines, i.e. MS and MIS, into the same analysis.

Another contribution to the domain of knowledge is that this thesis examines IT as a competitive factor from a strategic management perspective, in contrast to traditional research that focuses on the characteristics of IT for achieving competitive advantages.

This thesis presents its contributions by means of analysis, definitions, and the development of models and frameworks for strategic analysis. The contributions of this thesis to the domain of knowledge of SMIT are summarized in Table 33.

The second contribution of this thesis is the integration of factors of a different nature into a common framework for strategic analysis. Chapters 6–9 explored factors such as strategic management, the competitive environment, and IT as competitive factors. These factors are considered of a different nature because they address different issues; management, context, and resources. Moreover these factors are found in different disciplines (i.e. MS and MIS). Considering that different disciplines have different analytical perspectives, it is an achievement of this thesis to find a way to relate factors from both disciplines, and the identification of patterns for the relationships between those factors.

The contributions of this research are models and frameworks for strategic analysis. Additionally, the integration of these models and frameworks into a holistic framework for the strategic management of information technology (Chapter 10) is another contribution to the SMIT domain of knowledge. First, I propose a definition of SMIT. The contributions of Chapters 6–10 are the

exploration of factors related to strategic management that are summarized in models and frameworks of analysis. Finally, all models and frameworks proposed in Chapters 6–9, i.e. strategic management, the competitive environment, strategies, and IT, are summarized in holistic frameworks presented in Chapter 10.

Since the conclusions proposed in the next section, are based on these contributions, Table 33 is included in this section to summarize them.

Table 33: Contributions to the domain of knowledge of SMIT

Chapter	Contributions	Tables, Figures, Frameworks
Chapter 2	Conceptualization of SMIT (Chapter 2) Definition of SMIT (2.5)	Definitions of Strategy (Table 3). Definitions of Management from the perspective of MS (Table 4). Definitions of Management from the perspective of MIS (Table 5) Definitions of Information (Table 6). Definitions of Knowledge (Table 7). Definitions of Technology from the perspective of MS (Table 8). Definitions of Information Technology from the perspective of MIS (Table 9).
Chapter 5	Research design (5.2) Research focus for SMIT in this thesis (5.2.1)	Research focus for SMIT in this thesis (Figure 8)
Chapter 6	Factors related to Strategic Management (6.3) Strategic Management Perspectives (6.4): Business Management, IT management	Relation between Part I and Part II (Table 21). Strategic Management definitions (Table 22). The role of Strategic Management (Table 23). Factors related to Strategic Management (Table 24). The role of the IT manager (Table 25). Framework for Strategic Management Perspectives (Figure 13), Framework for Strategic Management roles and factors (Figure 14)

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Chapter	Contributions	Tables, Figures, Frameworks
Chapter 7	Exploration of the factor Competitive Environment (7.1) Characteristics of the Competitive Environment (7.1.1): Common Competitive Environment, Industrial Environment, Business Unit Environment, and Firm environment	Characteristics of the changing Environment (Table 26). Framework for Competitive Environment (Figure 17)
Chapter 8	The role of competitive outcome in competition (8.1) Characteristics of competitive outcome: No Advantage, Competitive Advantage, Sustainable Competitive Advantage	Framework for Competitive Outcome (Figure 18)
Chapter 8	The role of competitive strategies in competition (8.2) Common factors related to Competitive Strategies (8.2.3)	Relation between Competitive Focus, Competitive Strategy, and Competitive Factors (Table 27). Framework for Competitive Strategies and Competitive Outcome (Figure 20)

Continues

Continued

Chapter	Contributions	Tables, Figures, Frameworks
Chapter 9	Competitive factors (9.1) Strategic analysis of IT as Competitive Factor (9.2)	Definitions of Competitive Factors (Table 28). Relation between Competitive Environment, Competitive Strategy, and Competitive Factors (Table 29). Framework for Competitive Factors (Figure 21) Framework for IT as Competitive Factor (Figure 22).
Chapter 10	The development of a framework for strategic analysis based on strategic management (SM)	Framework for SM (Figure 23)
	The development of a framework for strategic analysis based for the strategic management of information Technology	Framework for SMIT (Figure 24)

(Source: Chapters 1–10)

11.3 Implications

This thesis contributes to *strategic management* research by clarifying the relation between strategic management, strategies, competitive advantages, and information technology. As this thesis presents the state-of-the-art related to *strategic management* it could also be a valuable reference for strategic managers, as well as researchers interested in the *strategic management of information technology.* This thesis has presented several models and frameworks that can be used to explore factors related to SMIT (See Table 33).

11.3.1 Implications for theory

Considering the impact of IT on competition, the strategic management of information technology (SMIT) is a top issue to research. Events such as globalization, the developments of the Internet, and the increasing need to manage information demand future research. As long as IT changes, there is a need to adjust research related to SMIT. This is because changes in IT challenge strategic managers to quickly adjust competitive strategies to meet these changes, and at the same time stay aligned with business strategies.

Focusing on strategic management of information technology as an enabler for competitive advantage demands new research paradigms. First, the discipline of management science (MS) and management information systems (MIS) should work together in research to search for answers that can be used to explain strategic management. This thesis proposes the inclusion of additional research to these disciplines. While the discipline of MS could include in its strategic management paradigm the consideration of IT in its research, the discipline of MIS could include in its multilevel paradigm the consideration of the competitive environment. In this way, both disciplines could produce holistic research that may explain all factors of SMIT. Considering that until now both disciplines have given limited answers to the many questions related to the *strategic management of information technology*, further research in SMIT is needed to understand how to manage information technology in its competitive context.

There is the need to conduct further research related to SMIT. The research can be conducted in the MS and MIS disciplines. However, both disciplines should broaden their research scope. MS research should include IT in a strategic analysis and its relation to the environment. MIS research should include strategic analysis and the environment in its considerations of IT.

SMIT research seems to need a new paradigm that includes competitive environment as a factor to be considered in strategic management. Because the scope of new IT technology is wider now than it was before, for example a global scope instead of a business scope, the inclusion of an analysis of the

environment is needed. Moreover, as the characteristics of the environment change, the effect of competitive strategies and competitive factors also change. This demands a continuous evaluation of competitive factors and the effects of IT on competition.

Until now, the SMIT research has been conducted primarily in two major disciplines; Management of Science (MS) and Management of Information Technology (MIS). The research of both disciplines is limited regarding SMIT. It seems therefore necessary to expand the scope of these disciplines to include both the competitive environment and IT into same research questions. Among other research related to the strategic analysis of IT made in this thesis, the research of Porter (2001), Kalling (1999), and Clarke (2001) can be compared. While Porter and Kalling analyzed IT from the perspective of specific competitive strategies (i.e. Porter analysis is in relation to Value chain, and Kalling in relation to Resource Based View of the firm), Clarke analyzes IT focusing on information requirements instead than technology. However, this thesis have analyzed several competitive strategies and identified common factors to consider in the strategic analysis.

Although much MIS research can be found analyzing IT from a strategic perspective (e.g. Earl, 1989–2001; Henderson & Venkatraman, 1999) the characteristics of IT has changed the pace of competition. Therefore, the research conducted in this thesis update the analysis of the factors related to SMIT to cope with the characteristics of IT today, and its impact in competition.

This thesis pursues a critical analysis of IT and focus on the impact of IT in competition. Therefore it studies IT as competitive factor in relation to strategic management and competitive environment. Since these factors belong to different disciplines, the explanation of their relationships contributes to expand existing knowledge about IT as competitive factor. Moreover, this thesis explains the nature of these interactions, which can be useful for the alignment between competitive strategies.

This thesis contributes to *strategic management* research by clarifying the relations between strategic management, strategies, competitive advantages, and information technology. As this thesis presents the state-of-the-art related to *strategic management* it can also be a valuable reference for strategic managers, as well as researchers interested in the *strategic management of IT*.

The major contribution of this thesis is presented in frameworks that can be used in strategic analysis; therefore the results of this research can be categorized in the discipline of strategic management. However, since the framework is also related to IT, the results of this research can be also used within the discipline of Management Information Science.

The identification of competitive factors and the relation between them is a preliminary step in learning how to manage these factors.

The factors related to SMIT can be further categorized into two dimensions: macro and micro. Macro factors are those that are outside the boundaries of the firm. Micro factors are those within the boundaries of the firm. In this thesis, the macro is the competitive environment, and micro factors are strategic management, competitive strategies, and competitive factors. Part II creates a common foundation for the understanding of macro and micro dimensions related to the *strategic management of information technology* (SMIT). The combination of macro and micro factors is important for strategic management. Therefore, in order to strategic manage IT strategically the analysis of both macro and micro factors is required.

This study combines three factors; strategic management, competitive environment, and IT. These factors are of a different character; however, they are connected to each other in the competition process. They are connected by their role in competition and integrated into a framework of analysis (10.3.3). These factors have different levels of dependency. The most independent seems to be the competitive environment. This is because no one can control or predict the competitive outcomes of the competitive environment. The next independent factor is IT; this is because no one can control IT developments and impact.

The generic factors for the strategic analysis were found by examining basic factors of competition such as; the strategist, the competitive environment, competitive strategies, and competitive outcomes. However, these generic factors were adjusted to; (1) match SMIT strategic analysis, and (2) to illustrate possible interactions between the competition and the role of strategic management. Consequently, the following adjustments were applied. The strategist is represented by a manager that develops competitive strategies and for the aim of this thesis is called strategic manager. The environment is the context in which competition occurs and is called the competitive environment. Strategies focus primarily on competitive strategies, or strategies aimed to improve the competitive position of the firm. Moreover, competitive strategies include combinations of competitive factors, for example IT, used as a competitive force. Finally, the competitive goal is related to the enhancement of competitive advantages.

The contributions summarized in Table 33 are relevant because they focus on the role of strategic management and IT management and their relation to the competitive environment and the competitive outcome.

The relevance of this study for academia is important for several reasons.

Research that combines different types of factors and analyzes their relationships is of high value for the research field of management information technology (Matson & Mitroff, 1973). Little research related to IT management was found that combines factors of a different character[233]. Considering that little research is conducted combining the factors analyzed in this thesis, the analysis of the causal-effect relationships between these factors is valuable for the Management of IT and IT strategies in the future. Therefore, the results of this thesis can be valuable for the field. This argument is also supported by Ives et al. (1980, p. 910), who consider that the field of MIS can benefit from a framework in which past and present research can be classified.

[233] *For further examples about factors of a different character see Ives et al. (1980, p. 927).*

For academia, the contribution is the integration of several research areas such as strategy, management and IT. The consideration of continuous changes in IT, IT strategy, and business strategies is important to study in alignment. The proposed frameworks can be used to explain and illustrate the relationships between IT, and competitive environment and their effects in competition and strategic alignment. This type of integrative analysis is rarely considered in previous research, thus these findings will hopefully contribute to an expansion of knowledge in IT management research.

The contents of this thesis have also a pedagogic value for researchers interested in IT, as well as for researchers from other areas. For IT researchers, there is a value in the analysis of IT from a strategic management perspective and the study of the relationship between these factors. For researchers in other areas the pedagogic value resides in the development of a framework resulting from the integration of different disciplines, i.e. MS and MIS.

11.3.2 Implications for managers

The implications of the competitive environment for the role of the strategic manager are described by the identification of common patterns of the factors of competition (See Figure 23 & 24). Some of the patterns found that have implications for strategic managers are summarized as follows.

One pattern to be considered by strategic managers is that all competitive factors, i.e. the competitive environment, competitive strategies, and competitive factors, have increased in complexity and scope over time. However, while evolution is always present in all factors, the rate of evolution may be different[234] between them.

Another pattern that is important to consider by strategic managers is that the evolution in one competitive factor, may produce responses in other competitive factors. Because of this evolution, the terminology related to the

[234] *For instance, the evolution of competitive factors is both static and dynamic.*

factors of competition changes and evolves. Consequently, a common understanding of the terminology and factors is necessary to create effective competitive strategies. Therefore, competition is a continuous learning process, where strategies need to be continually adjusted in order to achieve competitive advantages.

The implications for strategic managers focus on three factors that affect competitive outcomes the most: the role of the strategic manager in competition, the role of the competitive environment, and the role of theories of competition. Therefore, this thesis has analyzed patterns of relationships between the factors that can be used in future SMIT research. Managers who can be interested in this thesis are for instance IT managers, and business managers.

For practitioners, the contribution of this thesis is the presentation of an overview of the domain of knowledge related to SMIT research. The contents of this thesis give managers some understanding of why different business strategies require different IT strategies. The understanding of these relationships and synergies is crucial in order to use IT as a competitive factor in the achievement of competitive advantages. The proposed frameworks presented in this thesis will hopefully facilitate the formulation and adjustment of IT strategies that can support business strategies.

This thesis argues that an understanding of the relationship between strategic management, the competitive environment and IT can be helpful in the selection of appropriate choices that can enable competitive advantages. Thus, the descriptions, explanations, and the construction of frameworks presented in this chapter are aimed to be used in the analysis and development of IT strategies.

The models and frameworks proposed in this thesis are explained by giving examples of specific characteristics for each competitive factor. Therefore managers can use these models and frameworks as communications tools in strategic management.

11.4 Further research

This thesis explored the strategic management of information technology (SMIT) during the past 40 years. Still further research in SMIT is needed to understand how to manage information technology in its competitive context.

SMIT as a research issue is still unexplored. Many issues need further research. Strategic Management is related to two major perspectives; business management and the management of information technology. Both strategic managers and management of IT need to understand the relation between the factors presented in the framework for competitive analysis (10.3.3) in order to be able to manage the outcomes of their interactions. Therefore, further research into the relationship between IT, IT strategies, and IT management is required to understand the dynamics of changes and competitive advantages.

This thesis presented management change (6.2.4) and strategic alignment (6.2.5) as important actions in the role of the strategic manager. Since these factors are beyond the scope of this thesis (See Section 1.4), they can be further researched. Strategic alignment and management change can be further researched in relation to strategy, environment, and IT.

Chapter 4 has shown that there is a gap in MS research and MIS research regarding SMIT. This research has conceptualized the relation between a few factors, i.e. strategic management, the competitive environment, strategies, and IT, and identified some factors within each. However, this research does not claim to be all-embracing, therefore there must be many other factors that are important to investigate. One example can be factors related to the competitive environment that can increase or decrease the impact of IT, i.e. network externalities, network alliances, IT sharing. Another example can be factors of IT and IT strategy that affect competition. Consequently, much research is needed to understand factors that can affect competition and that are related to the strategic management of information technology.

Until now, it seems like researchers have focused on the strategic management of IT. At the time this research started, there were no papers on

SMIT. During the time that this research was conducted, a few papers appeared in journals that included the relation between the environment and IT.

I believe that there is much knowledge in MS and MIS research. Therefore, retrospective historical research that integrates this knowledge is a step forward in establishing scientific knowledge. However, I also believe that the pace of change in IT is faster than the pace of published research. Therefore, factors related to IT can be found in empirical studies. Additionally, there is a need for retrospective empirical studies of IT strategy implementation in relation to business strategies. These studies can be used to analyze causal-effects between strategic management factors and define which IT factors are most likely to affect the competitive results. This knowledge can be used to cope with the role of management change and to develop hypotheses that can be tested in further research.

However, much SMIT factors are still unexplored. The use of theoretical data in relation to unexplored issues requires more from the researcher to identify patterns of relationships. The challenge for researchers considering theoretical data is that the amount of research in the area of strategy and IT is overwhelming. Therefore, much qualitative analysis, and previous understanding of the domain of knowledge are needed to pursue this type of research. SMIT can be conducted from both MS and MIS disciplines. However, both disciplines need to expand the scope and focus of their research paradigms and include simultaneously in their research IT and the competitive environment to expand the domain of knowledge.

11.5 Doctoral dissertation

This thesis has conceptualized the meaning of SMIT, and explored important factors to consider in a strategic analysis. Moreover, this thesis has integrated the factors into a holistic framework for SMIT. Considering that these factors were found in theoretical sources, and that continuous IT

developments produce new effects on competition, a next step in the research cycle is to validate these results by collecting data from empirical cases.

Therefore, the research issues proposed in this licentiate thesis will be further investigated using empirical cases. The aim of empirical cases is to explore the importance of factors such as strategic management and information technology, and other relevant factors that can appear in empirical cases. The results of the empirical analysis will be integrated into the framework presented in this thesis to propose a final framework for SMIT. The integration of these results will be presented in a doctoral dissertation. The aim of the doctoral dissertation is to propose a final framework for SMIT.

11.5.1 Research design

The contents of this licentiate thesis will be used as the foundation for empirical cases that investigate the relation between strategic management and IT factors. The methodology used to validate and expand the framework is *inductive* because it will identify repetitive patterns of success or failure by the use of IS/IT strategies within specific contexts and settings. The inductive face will be achieved by the means of empirical cases in three companies. The criteria for the selection of companies to be considered in the empirical research are that much of companies' processes should be supported by IT, and that IT should be used as an enabler for competitive advantages. The focus of the analysis will be in the identification of relevant factors related to strategic management and IT that can be used to expand the framework developed in the licentiate thesis. The data will be collected by means of interview guides provided to business and IT members of the staff in the selected companies.

The doctoral thesis is a combination of the licentiate thesis and the empirical cases. The licentiate thesis follows a deductive analysis, and the empirical cases follow an inductive analysis. Consequently, the final doctoral thesis will be the result of the iteration between induction and deduction, some researchers such as Alvesson & Sköldberg (1994) would claim that this research is *abductive*. Nevertheless, because the affiliation between the

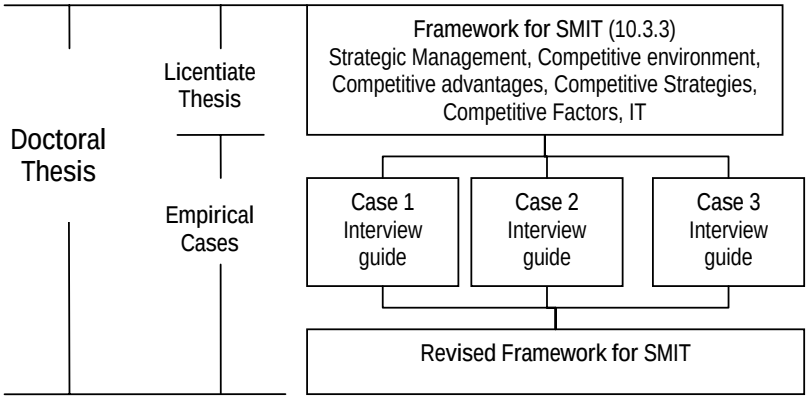
theoretical frameworks, which limits the empirical phenomena, researchers such as Stein (1993), would refer to this research as *semi-inductive*.

The methodology used for the proposal of the final framework can be called *emergent theory*, considering that the new theory will be the result of the iterations between induction and deduction. In this case the theoretical framework of reference developed by the licentiate thesis will be extended by the factors found in the empirical cases.

As a result of the research conducted in the empirical cases, several outcomes may be possible. One can be the identification of new factors that may be used to expand the preliminary framework. Another possibility is that some of the factors proposed in the framework presented in Chapter 10 will not be found in the empirical cases, which could lead to further discussions and analysis. Consequently, these factors may be removed from the final framework. A third alternative is that the factors found in the theoretical analysis will also be found in the empirical cases, which would help to further investigate their relevance.

It seems important to emphasis that the licentiate thesis presents a preliminary framework. A further research will continue this thesis with the validation of the framework with data from empirical cases. As a result of a final framework will be produced and complete the cycle of scientific research. Figure 25 (See next page) illustrates the research design proposed for the doctoral thesis.

Figure 25: Research design for the doctoral thesis



(Source: developed for this thesis)

Figure 25 illustrates the relation between the results of the licentiate thesis, the empirical cases, and the doctoral thesis.

The data will be collected through interviews. The respondents will be selected from business and IT managers to collect their perspectives. A common interview guide will be presented to the selected respondents. The interviews are expected to take 1 – 2 hours per respondent. In order to understand the data collected, a preliminary interview guide has been developed and is presented in the following pages.

Interview guide for Strategic Management of Information Technology

Objective

Explore factors related to the Strategic Management of Information Technology

Background information

Organization, Date, Name, Position, E-mail, Telephone

About competitive advantages

Describe your perceptions of competitive advantages
Which factors do you perceive as relevant for enabling competitive advantages due to strategic management?
Which factors do you perceive as relevant for enabling competitive advantages due to IT?
Can you give some examples?
Would you like to add any other comments about competitive advantages?

About the competitive environment

Describe your competitive environment
Describe the speed of competition, i.e. fast or slow.
How does the competitive environment affect IT?
How does IT affect your competitive environment?
Would you like to add any other comments about the competitive environment?

About strategic management

Describe your experience of strategy.
Describe your perception of strategic management
Describe your perception of the effects of strategic management on competition
Which factors do you consider important in enabling competitive advantages due strategic management.
Can you give some examples?

About IT

Describe your experience of information technology
Describe your perception of IT
Describe your perception of the effects of IT on competition
Which factors do you believe are important to consider in enabling competitive advantages due to IT?
Would you like to give some examples?
Would you like to add any other comments about IT?

About Strategic Management of IT

Which factors do you perceive as most relevant for the strategic management of IT?

What do you think you miss in SMIT?

Would you like to add any other comments about SMIT?

Additional information

Would you like to add additional comments?

Do you think any other member of the staff may have relevant answers to this questionnaire? Can you provide his or her name?

Appendix to the interview guide

Concept	Definition
IT	*..firm's total investment in computing and communications technology. This includes hardware, software, telecommunications, the myriad of devices for collecting and representing data (such as supermarket point-of-sale and bank automatic teller machines), all electronically stored data, and the people dedicated to providing these services. It includes the information technology investments implemented by internal groups (insourced) and those outsourced by other providers, such as IBM Global Services or EDS.* (Source: Weill & Broadbendt, 1998, p. 6)
SMIT	*"The strategic management of information technology (SMIT) is related to the achievement of companies' objectives by charting, planning, and designing the uses of information technologies and information strategies to enable advantages in the competitive environment."* (Source: Sections 2.5)

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Appendix A Critical Events in the development of MIS as discipline

Year	Key Events	Importance	Sources
1954	First business use of computers		Davis (2003:275)
1958	The publication of first article about the importance of computers Leavitt and Whisler (1958) Management. Hardward Business Review	The article forecasted large changes in organization structure and management in the next 30 years based on the availability of computers.	Davis (2003:275, 278)
1960	Forming of the International Federation for Information Processing (IFIP) and its Technical Committee 8 (Information Systems)	English was adopted as the common language for computed related disciplines, which allowed the freely exchange of research across the world.	Davis (2003:275)
1965	Börje Langefors appointed as professor in Information Processing	First information systems professor in Sweden, who contributed with conceptual literature, and developed the field in Scandinavia.	Davis (2003:275, 282)
1966	Langefors publication Theoretical Analysis of Information Systems	The publication developed the field in Scandinavian countries	Davis (2003:279,280)
1968	First formal MIS academic degree programs in the US (M.S. and Ph.D.) at the University of Minnesota		Davis (2003:275)
1971	Gorry and Scott (1971) publish research framework to guide scholarly research	Publication of the first framework that shows how to research within MIT.	Davis (1991:3)
1972	Publication of the first ACM curriculum in information systems		Davis (1991:3)
1973	Mason and Mitroff (1973) framework	Conceptual framework for the research of MIT	Davis (1991:3)

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Continued

Year	Key Events	Importance	Sources
1974	The publication of Davis, G. (1974, 1985), Management Information Systems: Conceptual Foundations, Structure, and Development (McGraw-Hill)	The first that defines the field that shows the major concepts employed in the field and their relationship to the structure of systems and management of the function.	Davis (1991, p.3) Davis (2003, p.280)
1976	First Technical Committee 8 (Information Systems) of the International Federation for Information Processing (IFIP)	The aim of the committee was to enhance the cooperation between practitioners from the domain of organizational information systems and information management	Davis(1991, p.3) Davis (2003, p.275)
1977	Publication of MIS Quarterly	First journal focus on the management of IS.	Davis(1991, p.3) Davis (2003, p.275)
1980	First International Conference on Information Systems (ICIS)		Davis(1991, p.3) Davis (2003, p.275)
1980	Ives and Davis (1980) framework		
1994	Formation of Association for Information Systems (AIS) as an international academic organization with an international governance		Davis (2003, p.275)

(Source: developed for this thesis from Davis, 1991, 2003)

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Sammanfattning
Abstract

Strategy and IT research has been extensively discussed during the past 40 years. Two scientific disciplines Management Science (MS) and Management Information Science (MIS) investigate the importance of IT as a competitive factor. However, although much research is available in both disciplines, it is still difficult to explain how to manage IT to enable competitive advantages. One reason is that MS research focuses on strategies and competitive environments but avoids the analysis of IT. Another reason is that MIS research focuses on IT as a competitive factor but avoids the analysis of the competitive environment. Consequently, there is a gap of knowledge in the understanding of the *strategic management of information technology* (SMIT).

The strategic analysis of IT as a competitive factor is important for achieving the competitive advantages of IT. This thesis explores factors related to strategy and IT that should be considered for the strategic analysis of IT as a competitive factor, and proposes a framework for SMIT. The research is conducted by means of a qualitative analysis of theoretical data from the disciplines of MS and MIS. Data is explored to find factors related to SMIT.

The results of the analysis show that the strategic management of information technology is a continuous process of evaluation, change, and alignment between factors such as competitive environment, competitive strategies (business and IT strategies), competitive outcome, and competitive factors (IT). Therefore, the understanding of the relationships between these factors is essential in order to achieve the competitive advantages of using IT.

This thesis contributes to *strategic management* research by clarifying the relationships between strategic management, competitive environment, and IT as competitive factor into a holistic framework for strategic analysis. The framework proposed is valuable not only for business managers and for IT managers, but also for academics. The framework is designed to understand the relationship between competitive elements during the process of strategic analysis prior to the formulation of competitive strategies. Moreover, it can also be used as a communication tool between managers, in order to achieve alignment among company strategies. To academics, this thesis presents the state-of-the-art related to *strategic management* research; it can also be a valuable reference for strategic managers, as well as researchers interested in the *strategic management of IT*.

Nyckelord
Keywords
strategic management, information technology (IT), competitive environment, and competitive advantages.

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