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INNOVATION-AS-PRACTICE: EXAMINING THE RELATIONSHIP BETWEEN LEADERS' ESPOUSED AND ENACTED INNOVATION, AND INNOVATION OUTCOMES AND FIRM PERFORMANCE

Marina G. Zona

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ABSTRACT

Innovation is widely regarded as a critical source of competitive advantage in an increasingly changing environment and thus has attracted considerable attention from both academics and practitioners. Thousands of scholarly papers have been published on the subject of innovation, yet the field remains theoretically fragmented and largely disconnected from the indexes and rankings of the practitioner world.

This thesis attempts to fill this gap through a qualitative research that examines the relationship between espoused and enacted innovation strategies, innovation outcomes and firm performance using a comprehensive practice-based framework of organizational innovation.

The specific research questions of this study are: *How does the congruence between leaders' espoused and enacted innovation strategies (EEIS) relate to innovation outcomes and firm performance? How do innovation outcomes mediate the relationship between EEIS and firm performance?*

Since a practice-based framework requires a qualitative methodology, a case based design is chosen for this study. Based on the criteria that have been tested by a large innovation survey, a theoretical sample of four firms has been identified for the purpose of this research. Qualitative and quantitative data were collected through archival research, semi-structured interviews, meeting observations and interactive discussion groups (Yin, 1994).

The findings of this research have provided a rich basis for analysis and theorizing and have lent support for the proposed comprehensive model of innovation. The gap between espoused and enacted innovation strategies has resulted in different types of innovation realized at each firm. Although four firms pursued different innovation strategies and had outcomes of different magnitude, most of them delivered expected firm performance. This confirms the equifinality of paths to performance, which thus can be achieved though incremental or radical innovation.

This dissertation contributes to academic research by developing a multi-dimensional framework and a comprehensive model of organizational innovation which will lead to the sustainable innovation outcomes; by developing a taxometry of different combinations of espoused and enacted innovation strategies; exploring the impact of incongruence between them on the short and long term performance, and by demonstrating the equifinality of innovation paths to performance whereby it can be achieved through innovations of different degrees of magnitude (i.e. incremental and radical).

Keywords:

Innovation, incremental, radical, practice-based view, leadership, practice, implementation, execution, firm performance

DEDICATION

To my dad who always encouraged curiosity, creativity and learning in me

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CHAPTER 1: INTRODUCTION

1.1 Background and Motivation

Innovation is widely regarded as a critical source of sustainable competitive advantage in an increasingly changing environment (Dess & Picken, 2000; Tushman & O'Reilly, 1996). The modern competitive environment is characterized by hypercompetition, "...intense and rapid competitive moves, in which competitors must move quickly to build advantage and erode the advantage of their rivals" (D'Aveni, 1994: 217). Although Porter (1996) argued that hypercompetion is limited to high technology industries, Wiggins and Ruefli (2005) found that hypercompetition exists among a broad range of industries today. Therefore, to remain competitive, a firm must continuously innovate to create new advantages (Dess & Picken, 2000; Tushman & O'Reilly, 1997).

While the definitions of innovation are many, in this thesis I take a comprehensive approach and define it as *the successful*[1] *production, assimilation and exploitation of novelty in economic and social spheres: renewal and enlargement of product, services and markets, establishment of new methods of value-added transformation, or new management systems. It is both process and result and involves the transformation of an idea into a marketable product or service.* This definition is particularly valuable as it: 1) highlights an inherent application component; 2) emphasizes intended benefits at one or more levels of analysis; 3) underscores the relative as opposed to the absolute novelty of an innovation (an

[1] In this definition 'successful' is understood as 'delivering expected results.' A detailed discussion about the notion of 'success' is presented in Section 7.4.

innovation may be common practice in other organizations but it would still be considered as such if it is new to the unit under research); 4) draws attention to the two embodiments of innovation (as a process and as an outcome) and 5) stresses the importance of implementation and success which allows me to argue for its contribution to firm performance.

A comprehensive definition calls for a comprehensive exploration of the available knowledge on innovation. An unrestricted search of the academic publications using the keyword *innovation* produces tens of thousands of articles – the result of a consistent annual growth of 14% in the past quarter of the century. However, this number may be misleading as more and more authors use the word 'innovation' as a substitute for creativity or a fashionable management label. Whereas more than half of highly cited papers in the period were related to 'real' innovation, only one sixth of all 'innovation' papers in the last three years truly belong to this category.

Out of ten thousand articles only 34 reviews were published. However, even those papers that were attempting to consolidate existing research were covering somewhat different issues and levels of analysis, including geo-political territorial models (Moulaert & Sekia, 2003), network (Pittaway, Robertson, Munir, Denyer, & Neely, 2004), firm-level (Damanpour, 1991) and process (Wolfe, 1994) models, implementation phase only (Klein & Knight, 2005), individual level of analysis (Anderson, De Dreu, & Nijstad, 2004), and leadership (Mumford & Licuanan, 2004). At the same time, there are an increasing number of practitioner-based measures, rankings and indexes that are often disconnected from the academic research

available, and researchers have called for work connecting these two areas (Huff, 2000; Starkey & Madan, 2001). This thesis attempts to bridge this gap by exploring the knowledge and usage of the innovation approaches proposed in academia by the practitioners. The first natural step towards this goal is to explore and synthesize the existing academic knowledge on innovation.

The comprehensive exploration of the available knowledge on innovation could become a lifetime endeavour without an appropriate methodology. An analytical review scheme is necessary for systematically evaluating the contribution of a given body of literature especially of this size (Ginsberg & Venkatraman, 1985). A comprehensive search differentiates a *systematic review* from a traditional narrative review (Tranfield, Denyer, & Smart, 2003). A systematic review uses an explicit algorithm, as opposed to a heuristic, to perform a search and critical appraisal of the literature. Systematic reviews improve the quality of the review process and outcome by employing a transparent and reproducible procedure (Tranfield et al., 2003). Although this methodology is not without challenges such as difficulty of data synthesis from various disciplines, insufficient representation of books, and large amounts of material to review (Pittaway et al., 2004), it was important to have a methodology that could deal with the breadth of the innovation field.

The results of this systematic review have produced a clear picture of a fragmented field with several theoretical streams emerging. Although learning and knowledge theories seem to be quite prominent, other management theories appear to be underutilized. The multiplicity of dimensions and their sporadic recognition across the literature, as well as insufficient theorizing, have led to fragmentation and lack of

interconnectedness. In this thesis, I propose a multidimensional framework of organizational innovation which ties together different dimensions proposed in the literature. Multidimensional conceptualization of the phenomenon is the first step towards a disciplined theoretical synthesis. Next, an appropriate theoretical platform is required to meet the ambitious goal of multilevel theorizing.

I employed the *Practice-Based View* (PBV) - a theoretical approach, which could combine the individual, firm, contextual and process variables prevalent in the literature. It is a contemporary theoretical perspective which has been gathering momentum since the 1980s in an effort to overcome bifurcation of the field between 'individualism,' favouring human action while ignoring macro-forces, and 'societism,' focusing on large social forces while discounting individual action (Whittington, 2006). PBV considers the activities that organizational actors conduct (micro level), their consequences for organizational outcomes (macro level) and the feedback loop from contextual and organizational variables back to the actors. Johnson, Melin, and Whittington (2003) argue that this approach does not replace traditional management theories such as the resource-based view or institutional theory, but rather provides what Bunge (1997) calls *a mechanismic explanation*[2] for them.

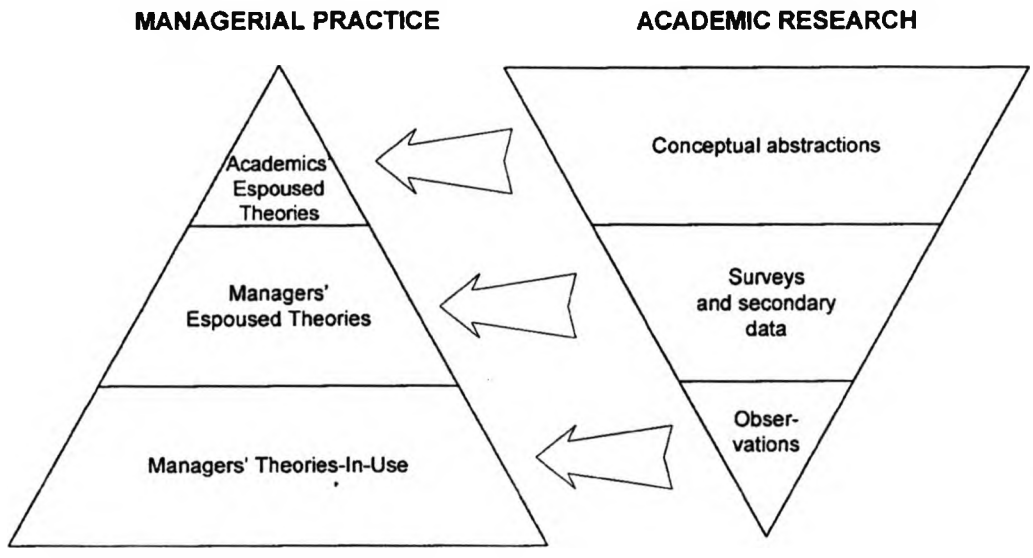
Based on Whittington's (2006) theory of practice, three elements of innovation can be isolated: practice, praxis, and practitioners. *Practice* represents the 'espoused theories' that guide this activity, such as shared patterns of behaviour, norms and procedures that can be altered according to the activity in which they are used

[2] An explanation which is contrived with the help of some theory about the mechanism or *modus operandi* of facts.

(Orlikowski, 1996; Seidl, 2007). *Praxis* refers to actual activities or, 'theories-in-use' (Argyris, & Schon, 1974) that constitute the fabric of innovation. *Practitioners* are those who actually perform praxis, be it leaders, middle managers or outside agents such as consultants or customers, for what they actually do affects a company's innovation. These three elements are integrated parts of a whole called innovation. In the context of the present thesis, a comprehensive innovation practice should include the totality of the academic knowledge unearthed in the process of the systematic review. It is what the practitioners *know* about innovation. However, *praxis* is what they actually *do*, and that requires totally different empirical methods than those found in existing research.

In fact, much of the research on innovation fits in the category of *practice*. The theories of effective innovation espoused in the academic literature represent conceptual abstractions rooted largely in other established theories and limited phenomenological research. The latter, in turn, is usually based on survey instruments and secondary data and, as such, represents espoused innovation theories of practicing managers. The realm of espoused theories is usually referred to as a 'macro level' of theorizing. Only rarely, have observation methodologies been employed which would enable researchers to access the activity-level theories-in-use enacted in the workplace (Figure 1.1). Yet, it is at this 'micro level' that the managerial reality enfolds every day, therefore a theory of innovation needs to connect the action (*praxis*) with the managerial and academic theories (*practice*) by understanding the role of agents (*practitioners*).

Figure 1.1. Managerial Practice and Academic Research



The innovation framework in this thesis attempts to rectify this disconnect by combining a macro conceptualization and a micro, activity-level, explanation of organizational innovation. The macro aspect of the framework, grounded in content and process theories, prescribes the necessity of a comprehensive innovation strategy for achieving superior innovation outcomes. The micro aspect of the framework, rooted in the PBV, postulates the necessity of the congruence between espoused and enacted innovation strategies for achieving superior firm performance. Although the extent of the micro level in the present dissertation is short of a full-length ethnography and limited to meeting observations, it is nevertheless a step towards combining these two levels within the unifying framework of PBV.

To synthesise a comprehensive innovation framework, one must look at what theoretical propositions have been supported by the empirical studies. About half of the papers reviewed contained empirical studies. However, the difficulties of fragmentation in the theoretical domain led to a similar picture in the realm of existing

empirical studies. Despite the abundance of measures of various elements of innovation, their relative importance has not been established and their connection with performance remains underexplored.

Innovation capability has been proposed as one of the most important determinants of firm performance (Mone, McKinley, & Barker, 1998), and this theoretical proposition has been empirically supported by several studies (Calantone, Cavusgil, & Zhao, 2002; Cooper & Kleinschmidt, 2000; Klomp & van Leeuwen, 2001; Li & Calantone, 1998). However, these studies focused on different types of innovation and used different measures of performance, so generalization is difficult, if impossible. Moreover, they connect innovation as a process or a capability with firm performance and by-pass innovation outcomes all together. On the other hand, studies concerned with innovation outcomes treat them as a dependent variable and not as a mediator to performance. One exception is the seemingly privileged position of the radical, or breakthrough, innovation, which is assumed, sometimes implicitly, to be *the* path to performance. In this thesis, I endeavor to trace the connection between determinants of innovation, innovation outcomes and firm performance all the way through and to question (and possibly debunk) the privileged position of the radical innovation.

Another unfortunate lacuna of the existing empirical research is the overwhelming prevalence of the quantitative studies based on perceptual measures. For example, although the importance of strategic[3] leaders' support and guidance in

[3] The focus of this study is on the strategic leaders, i.e. those senior executives who are responsible for setting and implementing the strategic direction of the company. Therefore, the term 'leaders' in this paper should be understood in this context.

promoting innovative efforts and creating conditions for the subsequent implementation of innovation has been highlighted, no research has established a clear connection between espoused innovation leadership, its implemented version (enacted innovation) and innovation outcomes and firm performance. Innovation often remains a symbolic statement or a 'black box' as managers presume that any innovation strategy would invariably lead to positive performance. My intent in undertaking this thesis is to investigate this presumption through a contextually and theoretically grounded qualitative research. Overall, my adoption of the PBV and corresponding qualitative methods is driven by an intention to 'peer' inside the innovation process.

The key concepts used in this study are:

Innovation – the successful production, assimilation and exploitation of novelty in economic and social spheres (see the full definition on p. 1);

Espoused innovation strategy – leaders' conceived approach to innovation;

Enacted innovation strategy – a strategy which was actually implemented;

Innovation outcomes – results of the implementation of the enacted innovation strategy in a form of product, service, process or business model. Unless explicitly specified, an 'outcome' refers to a general result of innovation process and not any particular form of it.

Firm performance – results of firm's activities assessed according to set standards which can be financial or operational, quantitative or qualitative.

The focus of this dissertation is summarized in the following research questions.

1.2 Research Questions

Based on the motivation outlined above, this thesis tackles two key research questions.

Research Question 1: How does the congruence between leaders' espoused and enacted innovation strategies (EEIS) relate to innovation outcomes and firm performance?

I begin answering this question by first investigating what leaders know about innovation and its execution, and how they acquire and update their beliefs. Then I compare and contrast what they know with what is actually enacted in an organization, trying to uncover the reasons for any discrepancies and probing leaders' awareness about it. Tracing this line of inquiry through various innovation outcomes to firm performance, I will attempt to establish whether there is an equifinality of innovation paths to performance. In other words, the firm performance may be achieved on the basis of innovation outcomes of different magnitudes.

Research Question 2: How do innovation outcomes mediate the relationship between EEIS and firm performance?

In order to explore my research questions, I consider different combinations of EEIS, and examine their performance implications at the firm level.

In the next section the theoretical grounding underlying this study is presented.

1.3 Theoretical Grounding

The systematic literature review conducted within the framework of this dissertation provides the basis for an informed innovation strategy firmly grounded in the thirty years of academic research on innovation. The existing theoretical developments are consolidated into a comprehensive model of innovation *practice* which serves as a prescriptive basis for an informed innovation strategy (Section 3.2.).

The comprehensive model of innovation *practice* includes four distinct meta-constructs which are connected with each other in a bi-directional way. The first construct, *Innovation Leadership*, consolidates individual and group level variables supporting innovation and is grounded in the upper echelon theory (Hambrick & Mason, 1984). The second construct, *Managerial Levers*, consolidates firm level variables that support innovation and is based on the theory of dynamic capabilities (Eisenhardt & Martin, 2000; Prahalad & Hamel, 1990; Teece, Pisano, & Shuen, 1997), a dynamic strain of the resource-based view (Barney, 2001). The third construct, *Business Processes*, consolidates process level variables and is rooted in the process theory (Van de Ven & Poole, 1995). The fourth construct, *Organizational Culture*, provides a vital connection between the prior three constructs in supporting innovation (West, 1990). Overall, each meta-construct is an independent entity grounded in a specific theory existing in the management field. The empirical studies identified in the literature review supply the specific measurements pertaining to each meta-construct.

In this dissertation, I develop a series of propositions (Propositions 1-4) which argue for necessity but insufficiency of each meta-construct alone for achieving sustainable innovation outcomes. Proposition 5 argues for the necessity of *all* four meta-constructs for achieving sustainable innovation outcomes. Therefore, an informed innovation practice should include all four meta-constructs distilled from the existing academic literature.

The second part of the theoretical section addresses specifically the Research Question 1 posed in this dissertation. Based on the theory of action (Argyris & Schon; 1974) and the PBV (Johnson, Melin, & Whittington; 2003), I argue that there may be a gap between leaders' espoused and enacted innovation strategies (Proposition 6). To recall, espoused innovation strategies represent the *innovation practice* element in the PBV, while enacted innovation strategies represent the *innovation praxis*. Both espoused and enacted innovation strategies (EEIS) can be either partial or comprehensive. In this thesis, I argue that only comprehensive EEIS and congruence between them will lead to short and long term performance (Proposition 10). If either of the two elements is partial, only short term performance is possible (Propositions 7 and 8), whereas partial status of both will prevent a firm from achieving even short-term results (Proposition 9). Overall, this thesis proposes a specific theoretically grounded prescriptive agenda, which addresses Research Question 1: the comprehensive espoused innovation strategy which is enacted congruently will deliver the best firm performance as compared with less comprehensive options.

Whereas Research Question 1 is developed though theoretical grounding and framed by specific propositions, Research Question 2 is opened for exploration within

the framework of this dissertation. Given the overwhelming preference for radical innovation in academia and practice, and my scepticism towards this treatment, I prefer to go into the field without any preconceived notion and let the data speak for itself during the process of this study. In the next section I will describe the research design which enables me to do so.

1.4 Research Design

According to Yin (1994), the case method is the most appropriate for studies that ask 'how' and 'why' research questions and are studied within a context by accessing people who are able to recall the pertinent events relatively accurately. This method is well suited for an in-depth analysis of complex phenomena with the inclusion of multiple sources of data (e.g. respondents' answers, archival documents and the researcher's impressions). Eisenhardt (1989) suggests that flexible multiple data collection alternating with within- and cross-case analysis allows the researcher to take advantage of emergent themes by looking beyond initial impressions. Iterative tabulation of evidence for each construct sharpens construct definition, validity and measurability, while replication logic across cases confirms, extends and sharpens theory. Finally, comparison with confirming and conflicting literature will build external and internal validity and raise the theoretical level.

However, empirical studies of questions framed within the PBV perspective face contradictory pressures. While ethnographic methods seem appropriate for a collection of data on practitioners within a context, current multinational and highly diversified organizational settings require methods that would provide both breadth and flexibility. Balogun, Huff and Johnson (2003) propose to complement the case

methodology traditionally used when the question of interest pertains to processes within a context (Yin, 1994) with additional methods of meeting observations and interactive discussion groups. Interactive discussion groups are a dialogue-based group level data gathering techniques that are less time demanding than observation or individual interview (Morgan, 1988). They are ideally suited for a practice-based research because participants might not be able to verbalize the tacit knowledge on which their theories-in-use are based outside of practice context (Suchman, 1987).

Overall, this combined methodology will enable me to capture both espoused theories of innovation (through semi-structured interviews and interactive discussion groups) and enacted innovation (through archival research and observations).

Although this research design is qualitative in nature, it will rely on some quantitative information such as performance measures. Moreover its results can be triangulated with a previously conducted Innovation Audit study[4] that explored the espoused innovation strategies through a large scale survey, which also serves as a basis for theoretical sample in this dissertation.

The theoretical sampling is a sampling strategy which attempts to provide a basis for theoretical generalization by strategically selecting cases representing contrasting clusters of the conceptual model under study (Eisenhardt, 1989). The case selection reflects representative categories hypothesized or identified in previous studies. Identification of such companies was based on the results of the survey mentioned above.

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[4] Innovation Audit study was conducted by a third party based on the theoretical framework developed in this dissertation. The results of this study are unpublished.

For Research Question 1, selected companies should represent different degrees of comprehensiveness of the espoused innovation strategies. This selection can be done based on the results of the survey which specifically assessed the perceived standing of each company with respect to each of the four meta-constructs of the comprehensive model and the perception of innovation outcomes. For Research Question 2, the sampling cannot be done *a priori* as assessing the degree of comprehensiveness of enacted innovation strategies and their congruence with espoused ones requires conducting observations, which is the purpose of the present study itself. Therefore the sampling was done based on Research Question 1.

Four Canadian companies in different industries were selected with a goal to cover different comprehensiveness of espoused innovation strategies and different perceptions of magnitude of innovation outcomes (incremental, radical, and business model). Eleven to twelve leaders representing different departments at different levels of management were interviewed in each company. Three meeting observations and one discussion group were conducted in each company. Numerous archival materials were collected. The research took place between fall 2008 and spring 2009.

Data analysis was conducted using existing qualitative methodologies (Corbin & Strauss, 2008; Miles & Huberman, 1994; Yin, 1994). First, data were transcribed and coded in nVivo8 software according to the 'bins' emerging from the theory and then analyzed to reach conclusion about the relationships between espoused and enacted innovation strategies, innovation outcomes and firm performance.

1.5 Thesis Contribution

Although innovation is widely regarded as a critical source of sustainable competitive advantage in academia and hailed as one of the 'must-haves' of a modern leader, both research and practice remain fragmented and disconnected from one another. The objective of this dissertation is to consolidate the existing academic knowledge of innovation into a comprehensive theoretically grounded framework and, using it as a prescriptive basis, assess the gap between espoused and enacted innovation strategies, and its relationship to innovation outcomes and firm performance.

This dissertation contributes to academic research by:

1. Developing a multi-dimensional framework of organizational innovation based on a systematic literature review of the last thirty years of research on innovation;
2. Developing a comprehensive model of organizational innovation which will lead to the sustainable innovation outcomes;
3. Developing a taxometry of different combinations of espoused and enacted innovation strategies and exploring the results of incongruence between them on short and long term performance;
4. Proposing the equifinality of innovation paths to performance whereby it can be achieved through innovations of different degree of magnitude; and
5. Conducting a qualitative study in an area with a paucity of qualitative research, which combines perceptual and direct measures that tap into cognitive and behavioural domains respectively.

This dissertation also contributes to managerial practice by:

1. Raising managerial awareness about the necessity of comprehensive innovation strategies for achieving sustainable innovation outcomes and firm performance;
2. Providing specific guidelines about what such comprehensive innovation strategy is comprised of;
3. Alerting leaders about the possible gap between espoused and enacted innovation strategies and its detrimental impact on firm performance; and
4. Questioning the preferential treatment of radical innovation outcomes and highlighting the importance of incremental innovation and the overall ambidexterity of innovation outcomes.

1.6 Thesis Organization

This thesis is organized in eight chapters. Chapter 1 provides an overview of the phenomenon of interest and the research questions.

In Chapter 2, after briefly discussing definitions, I present the results of the systematic literature review on innovation in order to provide a theoretical background for the study.

Chapter 3 focuses on theory development. The Innovation-as-Practice conceptual framework represents the latest developments in the academic world and serves as my prescriptive basis. Then, I develop a typology, grounded in theory of action, of leaders' cognition and behaviours with respect to innovation and propose connections between those and performance.

Chapter 4 explains the methodology used in this thesis. As practice-based view requires a qualitative methodology, a case based design is chosen for this study. Details on data collection methods, sample selection and the methodological procedures are provided in Chapter 5.

Chapters 6 and 7 present the analysis and interpretation of the findings of this research, and their relationship to the proposed theoretical framework.

Chapter 8 concludes this thesis by discussing the limitations of this study, providing academic and practitioner implications of the findings, and direction for future research.

CHAPTER 2: LITERATURE REVIEW OF INNOVATION

2.1 Definitional Issues

Definitions of innovation abound and all tend to differ in their emphasis. For example, the first definition of innovation was coined by Schumpeter in the late 1920s (Hansen & Wakonen, 1997), who stressed the novelty part of an innovation. According to Schumpeter, innovation is reflected in novel outputs: a new good or a new quality of a good; new method of production; new market; new source of supply or new organizational structure, which can be summarized as 'doing things differently.' However, as Hansen and Wakonen state, "it is practically impossible doing things identically" (1997, p. 350), and this makes any change an innovation by definition. Although Schumpeter clearly positioned his definition of innovation within the domain of the firm and outlined its extent as product, process and business model, there are continuing debates about the necessity and sufficiency of invention (Pittaway et al., 2004), intentionality (Lansisalmi, Kivimaki, Aalto, & Ruoranen; 2006), beneficial nature (Camison-Zornoza, Lapiedra-Alcami, Segarra-Cipres, & Boronat-Navarro, 2004), successful implementation (Hobday, 2005; Klein & Knight, 2005) and diffusion (Holland, 1997) to qualify as innovation. A sample of academic definitions of innovation is presented in Table 2.1

Table 2.1. Definitions of 'Innovation'

Definition	Reference
"the embodiment, combination, and/or synthesis of knowledge in novel, relevant, valued new products, processes, or services"	Leonard & Swap, (1999:7) in Deiss, (2004)
"an idea, practice, or object that is perceived as new by an individual or other unit of adoption"	[1] in Fleuren et al., (2004)

"the commercially successful exploitation of new technologies, ideas or methods through the introduction of new products or processes, or through the improvement of existing ones. Innovation is a result of an interactive learning process that involves often several actors from inside and outside the companies."	European Commission (1996: 54) in Simmie (2005)
"successful exploitation of ideas, into new products, processes, services or business practices, and is a critical process for achieving the two complementary business goals of performance and growth, which in turn will help to close the productivity gap"	DTI's Innovation Report (2003:8) in Pittaway et al. (2004)
"an innovating firm as one that has implemented technologically new or significantly technologically improved products or processes during the period under review (OECD Eurostat, 1997). This concept implies: (1) that a series of activities participating in the innovation process has been carried out in the company; and (2) that these activities have concluded successfully."	Flor & Oltra (2004)

I have adopted a comprehensive definition of innovation. Innovation is the successful production, assimilation and exploitation of novelty in economic and social spheres: renewal and enlargement of product, services and markets, establishment of new methods of value-added transformation, or new management systems. It is both process and result and involves transformation of an idea into marketable product or service.[5] Innovation diffusion has been excluded from consideration as it refers to the process taking place after the innovation, as I define it, has already occurred.

This definition is particularly valuable as it: 1) highlights an inherent application component; 2) emphasizes intended benefits at one or more levels of analysis; 3) underscores the relative as opposed to the absolute novelty of an innovation (an innovation may be common practice in other organizations but it would still be considered as such if it is new to the unit under research); 4) draws

[5] This definition is an abridged version of the current understanding of the concept of innovation as described in the European Commission's *Green Paper of Innovation* (1995: 1-2).

attention to the two embodiments of innovation (as a process and as an outcome) and 5) stresses the importance of implementation and success which allows me to argue for its contribution to firm performance.

Strategic decisions on how to innovate will be called 'innovation strategies.' I next turn to a summary of the systematic literature review that provided the background for this thesis.

2.2 Systematic Literature Review on Innovation

In order to understand which innovation strategies would deliver the best innovation outcomes for firm performance, I will first uncover the conceptual and empirical knowledge on innovation existing in the academic world. The latest scholarly thought in the field would then serve as my prescriptive basis, and as an 'informed' benchmark against which various innovation strategies enacted by the practitioners can be compared.[6]

An analytical review scheme is necessary for systematically evaluating the contribution of a given body of literature (Ginsberg & Venkatraman, 1985). A systematic review uses an explicit algorithm, as opposed to a heuristic, to perform a search and critical appraisal of the literature. Systematic reviews improve the quality of the review process and outcome by employing a transparent and reproducible procedure (Tranfield et al., 2003). Although this methodology is not without challenges such as difficulty of data synthesis from various disciplines, insufficient

[6] The comprehensive model serves as a prescriptive basis because it was based on the findings of the academic research. Practitioners may or may not be aware of the full extent of this model. One of the objectives of this dissertation is to find out how much do they actually know.

representation of books, and large amounts of material to review (Pittaway et al., 2004), it is important to have a methodology that could deal with the breadth of the innovation field.

I followed Tranfield et al.'s (2003) three stage procedure, which starts with planning followed by the execution of the plan and concludes with reporting. During the planning stage, the objectives of the research were defined and key data sources identified. The objective was intentionally broad and somewhat standard for such types of comprehensive reviews: to assess the range of definitional, conceptual, operationalizational and theoretical similarities and differences found in this research domain.

The sources were limited to peer-reviewed journals because these can be considered validated knowledge and are likely to have the highest impact in the field (Podsakoff, MacKenzie, Bacharach, & Podsakoff, 2005). The ISI Web of Knowledge's Social Sciences Citation Index (SSCI) database was chosen as a database of record, as it is one of the most comprehensive databases of peer-reviewed journals in the social sciences. Its unique feature of citation counts allows a triage of a large pool of articles based on this objective measure of influence. All years available in the SSCI database at the time of the research (from 1981 to November 7, 2008) were used.

The next stage of the systematic review process consists of the following steps: 1) initial selection criteria: keywords and search terms; 2) grouping

publications; 3) compiling a consideration set; and 4) classification and typology of the results.

2.2.1. Initial Selection Criteria: Keywords and Search Terms

A comprehensive search differentiates a systematic review from a traditional narrative review (Tranfield et al., 2003). Given the plurality of meanings embedded in the term 'innovation' and taking into consideration that researchers may have used this term in a variety of ways, I employed a general selection requirement for the initial pool to maximize the inclusion of all relevant studies. The initial search of the SSCI database was undertaken using the basic keywords: 'innovation' and its derivatives (i.e. TS=innovation*), document type 'article' and 'review' (but not 'book review'), language 'English,' subject area 'business,' 'management,' 'economics,' and 'finance' without any additional selection restrictions.[7] The keywords were used as a selection criterion for the *topic* (title, key words or abstract) resulting in an initial sample of 10,946 papers. This initial set was then fixed as the basis for all future analysis.

2.2.2. Grouping Publications

Since the main objective of this research was to understand the broad theoretical foundations of the area, the first group of interest were reviews and meta-analyses. The second, and the largest, group in this study was obtained by applying citation based selection criteria to the initial pool. Furthermore, considering citation biases and lags, I isolated the most recent publications (2006-2008) to which I applied

[7] We could have restricted our selection by excluding 'innovation diffusion' from the outset. However, doing so might eliminate papers which deal with diffusion *in addition* to innovation itself. So, we decided to eliminate purely diffusion papers during the abstract review.

a different selection criteria, as will be explained below. All three groups were checked for overlaps. The main entry was retained in the first group under consideration, while duplicating entries were eliminated from the subsequent groups. For example, a review was retained in Group 1, regardless of its citation rank; a highly cited paper was retained in Group 2 even if it was published recently.

2.2.3. Compiling the Consideration Set

Group 1: Reviews and meta-analyses. To identify reviews and meta-analyses I restricted the search to papers with 'innovation' in the *title* and 'review' or 'meta' in the *topic* (title, key words or abstract) of the paper. This search yielded 120 papers. Only 34 were reviews or meta-analyses in a proper analytical sense, with the remainder being purely descriptive and/or narrowly focused articles (e.g. libraries, healthcare, agriculture, manufacturing, biotechnology, State of Victoria, UK, small companies, etc.).

Group 2: Highly cited papers. I then continued with the main body of 10,946 articles that had 'innovation' in the *topic.* Citation-based analysis is widely used as a measure of paper quality, as paper citations serve as a *de facto* vote of its contribution toward knowledge accumulation and development (Saha, Saint, & Christakis, 2003). I identified 690 high impact papers, which had at least 5 citations per year (using 2009 as the base year). After reading the abstracts this pool was narrowed down to 367 papers that contributed to either theory development or theory testing, by excluding 1) book reviews, 2) non-business, purely descriptive and narrowly focused articles, 3) papers focused only on innovation diffusion, and 4) papers in which the term

'innovation' is used metaphorically as a substitute for creativity or strategic change.[8] Nine reviews and meta-analyses were excluded from Group 2 since they were already associated with Group 1.

Group 3: Recent papers. Recognizing that the citation-based method may discriminate against recent publications, since newly published papers do not have the time to accumulate citations, I added an additional pool from the most recent papers (2006-2008): 2,929 (27%) of the 10,946 papers were published during this period. As the citation-based criteria could not be used, I applied an alternative quality criterion for data reduction purposes. Based on the premises that top journals normally publish top quality papers, I used a combination of the ten most cited for journals publishing innovation research and the top 40 Financial Times journals (Table 2.2.) to isolate 754 papers. Indirect support for the selection criteria was the fact that in spite of their recency, nine papers in this pool were cited more than five times. These papers, which were already included in our highly cited pool, together with formerly mentioned reviews and analyses were excluded to avoid inter-group duplication. After reading the 745 remaining abstracts, I added 117 papers, which contributed to either theory development or theory testing, to the pool of 367 papers, resulting in a total sample of 518 papers.

[8] E.g. A paper entitled "The social psychology of creativity"(Amabile, 1983) has a key word 'innovation' but focuses on discovery and invention.

Table 2.2. Top 10 Journals Publishing Innovation Research

Source Title	# papers	% of 690 most cited
Strategic Management Journal	91	13.2%
Research Policy	63	9.1%
Academy of Management Journal	56	8.1%
Management Science	48	7.0%
Organization Science	39	5.7%
Administrative Science Quarterly	32	4.6%
Academy of Management Review	29	4.2%
Journal of Marketing	25	3.6%
MIS Quarterly	24	3.5%
Journal of Product Innovation Management	21	3.0%

These journals had the most articles covering innovation as a *topic*. Titles in italic are part of the top 40 Financial Times Journals.

The summary of my consideration set is presented in Table 2.3. There are no totals for most columns because paper pools overlap.

Table 2.3. The Number of Papers in Each Group

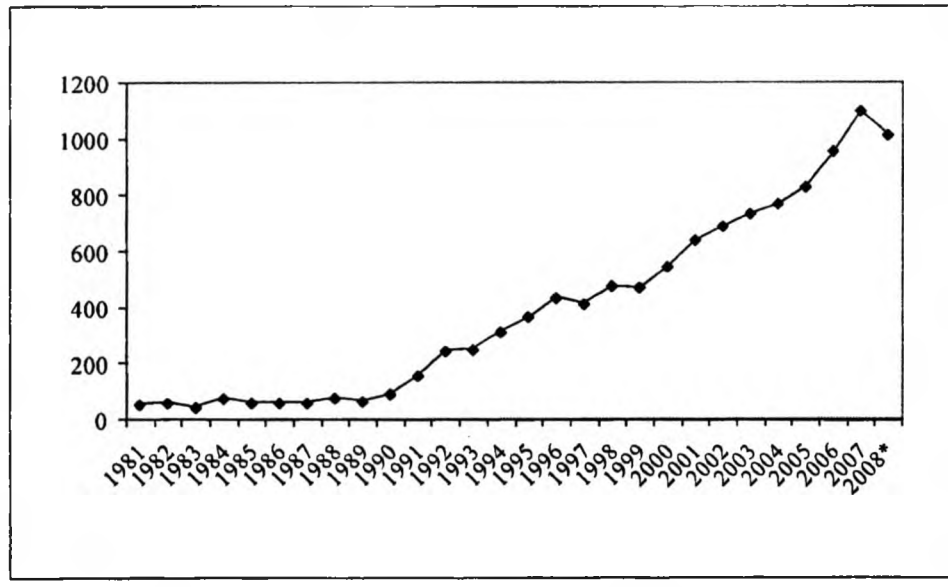
Groups	Initial pool	Filtered	Abstract analyzed	Less duplicates
Group 1: Reviews and Meta-Analyses	120	120	34	34
Group 2: Highly Cited Papers	10,946	690	385	376
Group 3: Recent papers	2,929	754	126	117
Total				518

The papers in consideration set were first analyzed descriptively.

2.3 Descriptive Analysis of Innovation Research

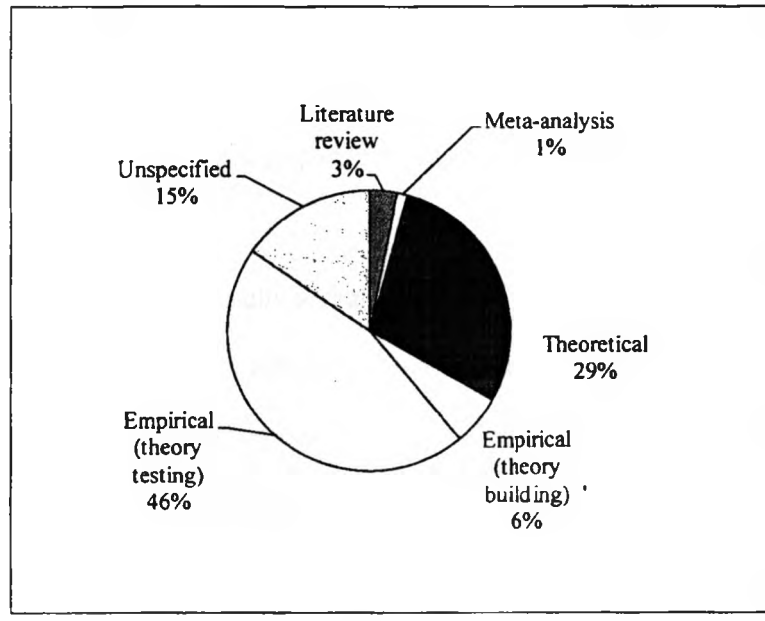
Since 1981, the number of publications in the fields of Business, Finance Economics and Management (as reported in SSCI's Subject Category field) with innovation as the *topic* grew at an average 14% per year from around 50 in 1981 to more than 1000 per year in 2008 (Figure 2.1). Theoretical papers represented about one third of the consideration set. The largest share was captured by empirical papers, with a particular emphasis on theory testing (46%) and less so on theory building (6%). Literature review and meta-analyses represented the smallest share (4%), while 15% of all papers were difficult to assign to any particular category (Figure 2.2).

Figure 2.1. Growth of Articles on Innovation in Business/Economics Journals



*Value for 2008 is estimated based on data until 11/07/2008.

Figure 2.2. Breakdown by Paper Type



The comprehensive nature of the definition allowed me to cast a wide net and it is therefore not surprising to find that the fragmented structure of the field revealed a multidimensional nature of the innovation domain. Gopalakrishnan and Damanpour (1997) propose the following dimensions of innovation: 1) level of analysis (industry, organization, or subunit); 2) stage of innovation process (ideation, project definition, problem solving, development and commercialization) and 3) type (product/process; incremental/radical; administrative/technical) (Appendix A). However, these dimensions are neither exhaustive, nor systematic. This comprehensive review was able to identify several additional dimensions discussed in the papers in the consideration set.

Different dimensions were used with varying consistency in the literature. However, even the most commonly used (level of analysis) was not mentioned in 14% of the papers, and the second most commonly used (innovation type) was not

mentioned in 44% of the papers. Therefore, it was possible to provide descriptive classification along only the two most frequently used dimensions: the level of analysis, and the type of innovation. Other dimensions were mentioned only in a few papers and thus could not be meaningfully graphed.

The analysis of the results revealed that half of the papers dealt with the firm level of analysis, with other levels being almost equally represented (Figure 2.3). In half of the cases the type of innovation treated in the paper was not clearly defined, while product innovation or technology innovation was the subject of about 20% of articles each (Figure 2.4). Only 4% of papers clearly specified a focus on the process. The dependent and independent variables were so diverse and numerous that their concise representation was not possible.

Figure 2.3. Breakdown by Level of Analysis

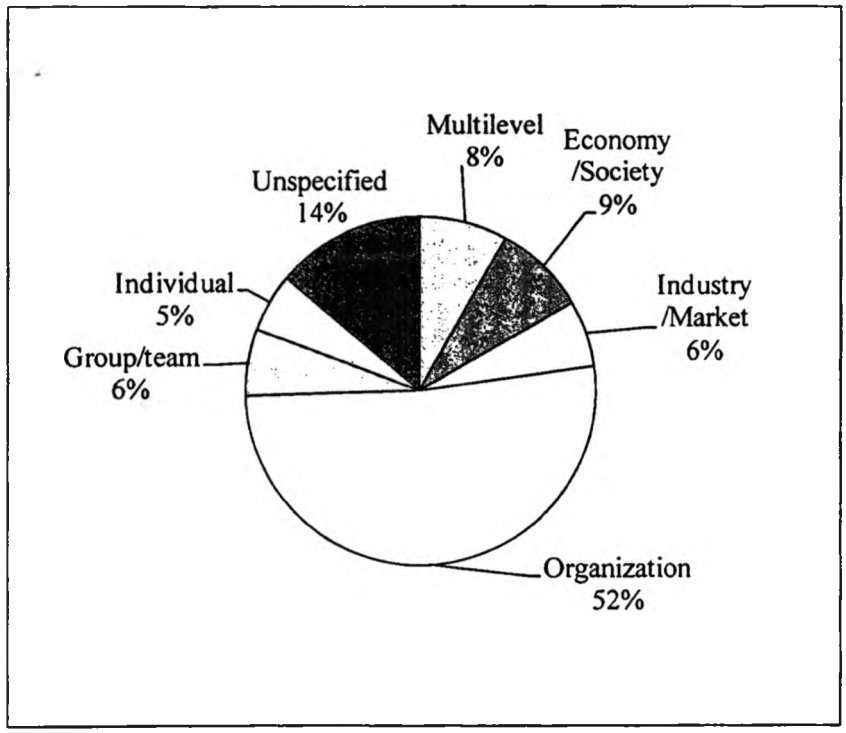
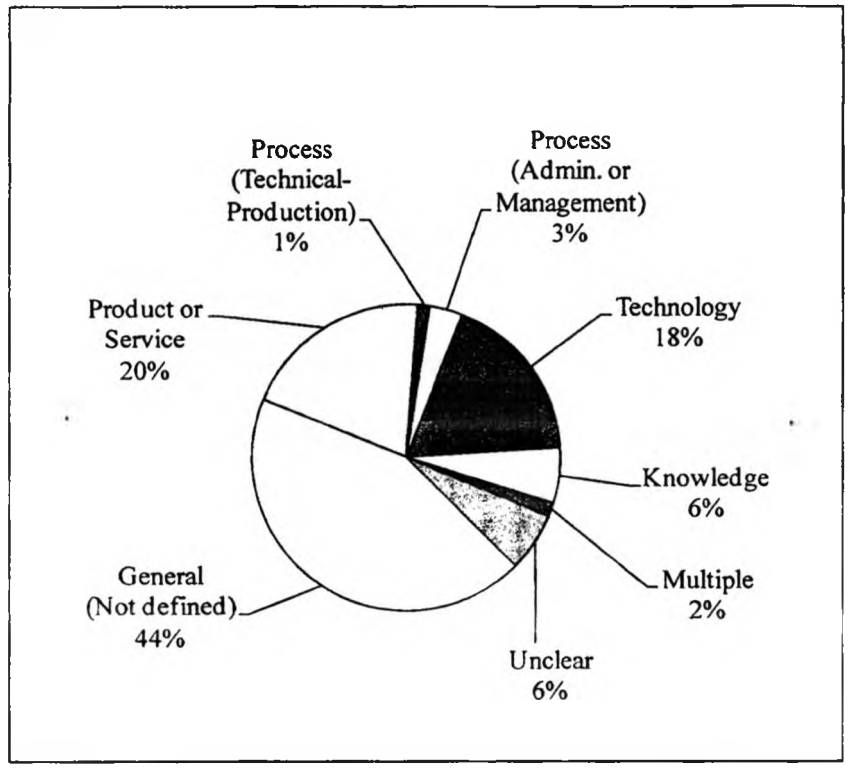


Figure 2.4. Breakdown by Innovation Type



Identifying, and cataloguing the multitude of dimensions implicated in innovation research is an important first step towards seeing all the parts of the proverbial elephant together. To understand how they 'work,' I reviewed the theories employed in our consideration set.

2.4 Scoping Out the Theoretical Field

The analysis of the theoretical content of the field proceeded in four steps. First, I reviewed the spectrum of the theoretical lenses used in the Group 2 (highly cited papers), the list of which I obtained during the classification phase. I then read the full texts of all review papers in Group 1, mapping their theories and models by levels of analysis. Finally, I selectively reviewed papers identified as theoretical or

theory-building in Group 2 and augmented the theoretical map where necessary. I concluded by identifying inconsistencies, gaps and tensions between levels, processes and theories.

Surprisingly, most papers in Group 2 were purely descriptive. Empirical studies tended not to convey a strong theoretical base. Only 1/7 of the papers (N=43) in Group 2 of the consideration set invoked a theory. Most commonly used were learning and knowledge management theories (17 papers), followed by network theories (10 papers), and economic theories (8 papers). Institutional theory, resource based view (RBV) and adaptation theories were used in 3 papers each. Nine papers used a host of other theories (Table 2.4).

Table 2.4 Mapping of Theoretical Works across Theories and Analysis Levels

	Multilevel	Macro (Economy/Industry/Market)	Organization	Micro (Group/Team/Individual)
Institutional	Burns & Wholey (1993)	Cohen & Levin (1989) Haunschild & Miner (1997) Westphal, Gulati & Shortell (1997)	Balachandra & Friar (1997) (contingency) Lam (2005)	
Economics & Evolution	Berry & Berry (1992) Van de Ven & Poole (1995)	Coe & Helpman (1995) Feldman & Florida (1994) Pouder & St.John (1996)	Blundell, Griffith & van Reenen (1995) (path dependence) Brown & Eisenhardt (1997) Pil & MacDuffie (1996)	
Network	Burns & Wholey (1993) Ibarra (1993)	Ahuja (2000) Hargadon & Sutton (1997) Porter (1998) Westphal, Gulati & Shortell (1997)	Hansen (1999) Powell, Koput & Smith- Doerr (1996)	
Resource-Based View & Dynamic Capabilities			Christmann (2000) Lei, Hitt, & Bettis (1996) Teece (1998) Tidd et al. (1997)	
Learning, knowledge management, adaptation, change	Brown & Duguid (1998) von Krogh (1998)	Hargadon & Sutton (1997) (org memory) Haunschild & Miner (1997)	Cohen & Levinthal (1990) Denison,Hart & Kahn (1996) Edmondson, Bohmer & Pisano (2001) Eisenhardt & Tabrizi (1995) Grindley & Teece (1997) Lam (2005) McGrath (2001) Powell (1998) Powell, Koput & Smith-Doerr (1996) Tushman & O'Reilly (1996) Sorensen & Stuart (2000)	Leonard & Sensiper (1998) Orlikowki & Gash (1994)
Other theories	Woodman, Sawyer & Griffin (1993) (interactionist)	Finnemore (1993) (constructivist)	McGrath (1997) (real options)	Agarwal & Prasad (1999) Chatman, Polzer, Barsade & Neale (1998) Harrison, Mykytyn & Riemenschneider (1997) Mick & Fournier (1998) Mintrom (1997)

Distribution of theories by level of analysis is also quite interesting. Network, learning and knowledge theories are used across all levels. Economic theories are mostly used at the economy or societal level, but evolutionary economics is used evenly across macro levels. RBV and adaptation theories are used at the organizational level, while psychological theories are quite appropriately applied at the individual level. In sum, many studies in Group 2 (highly cited papers) did not invoke a strong underlying theory, and the theoretical perspectives that were employed tended to be quite disparate and generally operating at a single level.

There was also no overarching framework of innovation in Group 1 (reviews and meta-analyses). Even those papers that were attempting to consolidate extant research were covering somewhat different issues and levels of analysis, including geo-political territorial models (Moulaert & Sekia, 2003), network (Pittaway et al., 2004), firm-level (Damanpour, 1991) and process (Wolfe, 1994) models, implementation phase only (Klein & Knight, 2005), individual level of analysis (Anderson et al., 2004), and leadership (Mumford & Licuanan, 2004).

The level-based split of the findings is reflected in a conceptual mapping (Appendix B), where each level was represented by a separate rectangle area. Due to the relatively small number of studies covering the group level, they were consolidated with the individual level.

Several issues emerged during the review. Although a few theories (resource-based view, knowledge-based view, organizational learning and network theory) were used by several authors, the lack of a coherent and explicit theoretical base prevails.

Hobday (2005) has reviewed five generations of innovation models developed from the 1950s to the 1990s (technology push, marketing pull, coupling models, integrated models and networking models) and confirmed Mahdi's (2002) finding that even the latest innovation models failed to capture consistently across- and even within-sector factors. The author argues that intra-sector differences are due to the path dependent and iterative nature of the innovation process, thus a proper model should adopt an evolutionary approach and allow equifinality.

This review has identified several tensions that might not be obvious within the scope of an individual paper. For example, the tension between external and internal sources of innovation (e.g. market orientation vs. R&D) only becomes salient when both types of sources are explicitly recognized. Innovation scholars often focus on R&D effort alone, leaving out the influence of market orientation, which may not converge with that of R&D. In the early innovation studies, the innovation construct itself was operationalized as R&D intensity, or as number of patents. These 'old' constructs have proven not to be generalizable for different organizational types and purposes (Adams, Bessant, & Phelps, 2006) as more and more firms move towards proactive market orientation.

From an organizational learning perspective, the known exploration-exploitation tension is exacerbated by the fact that both radical and incremental innovations are a part of exploration, inherently juxtaposed with exploitation. Finally, a major, often unrecognized, gap exists between adoption (decision to implement or use) of innovation and actual implementation. This issue is especially important because, as the used definition stipulates, commercialization is an inherent part of

innovation. If implementation is delayed, ill managed or aborted, the innovation would fail to deliver the results an organization is expecting.

This review has produced a clear picture of a fragmented field with several theoretical streams emerging. Although learning and knowledge theories seem to be quite prominent, other management theories appear to be underutilized. The multiplicity of dimensions and their only sporadic recognition across the literature, as well as insufficient theorizing, have led to fragmentation and a lack of interconnectedness. The review identified an opportunity for synthesis which will be described in the next section.

2.5 Innovation as a Multi-Dimensional Construct

This section consolidates the data obtained in the literature review into a comprehensive multi-dimensional framework of innovation. First, I develop the overarching sequential framework and establish the basis for alignment between its components and the innovation dimensions. I then map dimensions onto the framework and explain connections between them. I provide measures for the determinants of innovation collected from the reviewed literature and conclude with a discussion of innovation as an outcome.

Innovation is a broad term with multiple meanings; it draws on theories from a variety of disciplines and has been studied using a wide range of research methodologies. The synthesis is further complicated by multiple levels of analysis and dimensions, and inconsistent operationalization of the primary constructs, which led to mixed empirical results. For example, the positive relationship between size and

innovation was not always statistically significant in empirical studies (Camison-Zornoza et al., 2004). As Damanpour (1992) discovered and Camison-Zornoza et al. (2004) confirmed, it was due to the fact that researchers operationalized size in a different way (log vs. raw data, personnel vs. non-personnel measures). Although complexity and fragmentation of innovation research may be seen as a challenge, it offers an opportunity to gain a more detailed understanding of the phenomenon within an overarching framework.

The systematic literature review provides material for developing such a framework within the boundaries delineated by the identified dimensions. Prior research has typically focused on only one dimension, of which the most prominent has been a vertical approach, focusing on level of analysis. Conversely, other studies have focused on innovation as a process, employing more of a horizontal approach for synthesis. However, as the foregoing review reveals, arguing on the basis of one and even several dimensions misses the larger picture. Thus, I seek an approach that allows a more comprehensive means to integrate the various dimensions of organizational innovation. I take as a starting point the structure of most theories which tends to follow an approach which seeks to describe and/or predict, and, ideally, to explain the phenomena of interest in a field (Bunge, 1997; DiMaggio, 1995; Sutton & Staw, 1995; Weick, 1995) by establishing correlations and, if possible, causality between constructs. Although phenomena usually have multiple causes and complex feedback loops, the basic causal 'building block' is a sequential relationship. Thus, I adopt a sequential view for this framework to make it useful for future theory building.

The definition adopted in the thesis provides the first obvious relationship: innovation as a process will always precede innovation as an outcome. The underlying sequence employed in this synthesis starts with leadership since leaders play a critical role in initiating and maintaining innovation as a process (Mumford and Licuanan, 2004), which ultimately results in innovation as an outcome.

The next step of the synthesis is to map dimensions identified in this review onto this overarching sequential framework. In order to align dimensions with the framework's components, I sought to identify the types of questions being asked within each component. Leadership can be easily paired with 'who?', innovation as a process - with 'how?' and innovation as an outcome - with 'what?' Based on this simple principle, the following associations between dimensions and the framework's components emerge.

Dimensions pertaining to innovation as an outcome should answer the questions 'what' or 'what kind.' *Form, type, magnitude* and *referent* dimensions deal specifically with these questions. *Form* of innovation outcome can range from product or service to process or business model. Process as a *form* of innovation outcome should not be confused with innovation viewed as a process. As it will be shown later, organizational processes of ideation and problem solving may result in an outcome in the *form* of a new process of issuing credit cards, managing accounts receivable or producing maple syrup. So, innovation outcome in the *form* of a process can be either a technical (e.g. syrup production) or administrative (e.g. accounts receivable) *type*. The *referent* dimension establishes the benchmark, which defines the newness of innovation as an outcome. Newness can be new to the firm, to the market it serves, or

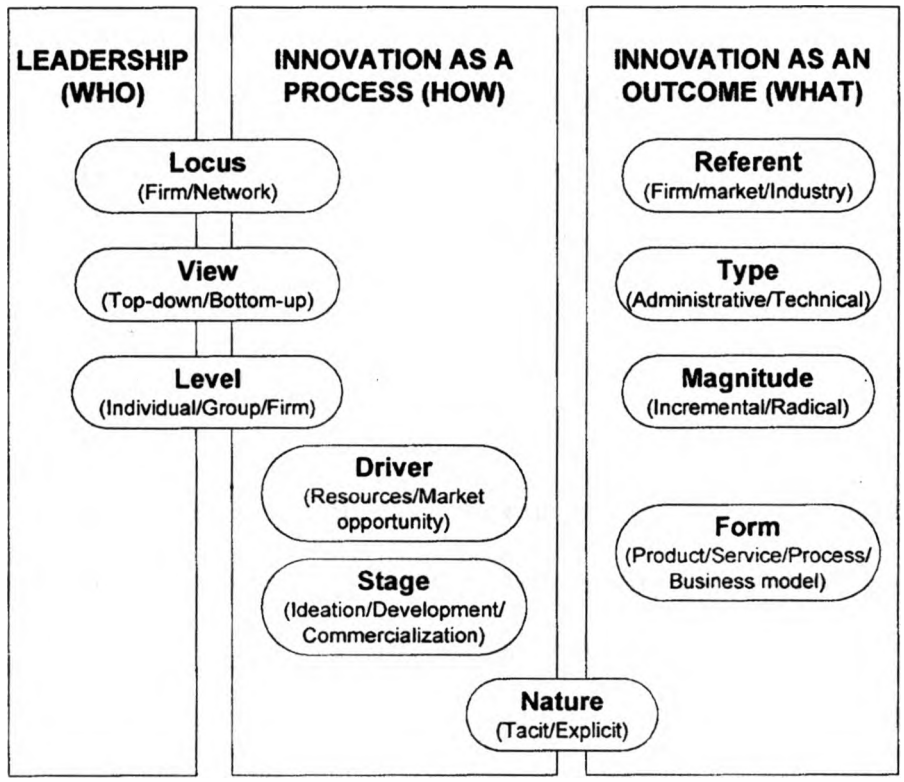
to the industry. The *magnitude* dimension indicates the degree of newness of the innovation outcome with respect to an appropriate referent.

Dimensions pertaining to innovation as a process should answer the question 'how.' *Driver* and *stage* dimensions deal specifically with this question. A *Driver* of the innovation process can be either internal (resources) or external, while the process itself will usually proceed through the *stages* of ideation, project definition, problem solving, development and commercialization.

The remaining dimensions are not component specific as they may answer several questions. This contributes to the confusion in the field and difficulty with disentangling these dimensions. *Locus, view* and *level* dimensions address both 'who' and 'how' questions. The *locus* dimension defines who is involved in an innovation process: firm only (closed process) or network (open process). The *view* dimension considers who starts the innovation process and how it develops: top-down or bottom-up. The *level* dimension delineates the split between individuals, groups and firm processes.

Finally, *nature* (tacit or explicit) can be applied to both 'how' and 'what.' While innovation as a product is largely tacit, innovation in a service or process may remain unarticulated. The overall mapping of the dimensions on the innovation framework is presented in Figure 2.5.

Figure 2.5 Multi-dimensional Framework of Organizational Innovation



Given the sequential logic of the foregoing discussion, innovation leadership enables innovation as a process which ultimately leads to innovation as an outcome. However, innovation as a process and innovation as an outcome are not equally important. Recall that the definition of innovation includes the aspect of 'success,' exemplified by 'a marketable product or service.' Thus the role of innovation as an outcome is both necessary and sufficient, whereas that of innovation as a process is only necessary but not sufficient. This is why innovation as an outcome is usually the key dependent variable in empirical studies related to innovation, while leadership and innovation as a process are subsumed under the umbrella of determinants of innovation.

2.6 Innovation as an Outcome

The distinction between innovation as a process and as an outcome is sometimes blurred. As Sood and Tellis (2005) point out, lack of clarity in separation of these two facets of innovation may be intrinsically problematic. This problem is compounded when innovation outcomes are confused with market performance (e.g., new entrants that displace incumbents with disruptive technologies) such that researchers risk asserting premises that are true by definition.

The literature review identified four dimensions of innovation as an outcome: *form, magnitude, type* and *referent*. While the first two tend to be related, they are often used separately. In terms of *form*, scholars differentiate three: 1) product or service innovation, 2) process innovation and 3) business model innovation. Product/service innovation is "the novelty and meaningfulness of new products introduced to the market in a timely fashion" (Wang & Ahmed, 2004, p. 304). Depending on the referent, this may mean different things, i.e. a product or service can be new to the company (Davila, Epstein, & Shelton, 2006), customer (Wang & Ahmed, 2004), or the market (Lee & Tsai, 2005). Process innovation is the "introduction of new production methods, new management approaches, and new technology that can be used to improve production and management processes" (Wang & Ahmed, 2004: 305). Process innovation is an internal phenomenon so the referent is essentially the firm itself. Business model innovation is "how a company creates, sells, and delivers value to its customers" (Davila et al., 2006, p. 32) whether it be new to the firm, customer or industry.

Form of innovation outcomes is the mostly widely used dimension. Sometimes different forms of innovation are even treated as totally separate, unrelated phenomena. In this thesis, I am taking a holistic approach to innovation and thus 'innovation outcomes' are viewed as general results of innovation process.

In terms of *magnitude* of innovation, scholars tend to distinguish between incremental and radical innovation (Gopalakrishnan & Damanpour, 1997). The latter is sometimes termed as 'revolutionary,' 'disruptive,' 'discontinuous,' or 'breakthrough' (Freeman, 1974; Garcia & Calantone 2002; Tushman & Anderson 1986). Radical innovation induces fundamental changes and a clear departure from existing practices in the organization, while incremental innovation represents a variation in existing routines and practices (Damanpour, 1991; Dewar & Dutton, 1986; Ettlie, Bridges, & O'Keefe, 1984). The absolute and relative magnitude of innovation outcomes have been a subject of debate. Academic researchers and practicing managers tend to focus on the exploratory radical innovation, leaving exploitative incremental innovation in the backstage (Jansen, Vera, & Crossan, 2009). The empirical research in this thesis suggests that incremental innovation might not even be perceived as 'innovation' by managers. Although the importance of ambidexterity in pursuing both types of innovation has been highlighted (Tushman & O'Reilly, 1996), firms seem to have difficulty implementing both to the same extent.

Clearly, the *form* and *magnitude* are related in that incremental innovation is often associated with product or process innovation while radical innovation is more often associated with business model innovation. However, there are product innovations that are considered radical in nature.

The *referent* dimension establishes the benchmark which defines the newness of innovation as an outcome; it can be new to the firm, to the market it serves, or to the industry. The referent and magnitude dimensions are clearly related: while incremental innovation such as continuous improvement initiatives may be new to the firm, more radical innovation will be associated with the market and even industry.

Finally, in terms of *type*, Gopalakrishnan and Damanpour (1997) distinguish administrative and technical innovations that reflect a more general distinction between social structure and technology. Technical innovations include products, processes and technologies used to produce products or render services directly related to the basic work activity of an organization. Conversely, administrative innovations are indirectly related to the basic work activity and more directly related to its managerial aspects such as organizational structure, administrative processes and human resources.

Overall, innovation as an outcome still remains the main focus of most scholars of innovation, and rightly so, because it is both a necessary and sufficient part of innovation *per se*. However, in doing so, important determinants of innovation can be overlooked. This review seeks to consolidate innovation research into a comprehensive multi-dimensional framework. I next turn to a review of the theoretical background underlining this study.

CHAPTER 3: THEORETICAL FRAMEWORK AND PROPOSITION DEVELOPMENT

3.1 Practice-Based View

Innovation research draws on theories from a variety of disciplines. To meet the ambitious goal of multilevel theorizing, I employed the Practice-Based View (PBV). This theoretical approach combines the individual, firm, contextual and process variables that are prevalent in the literature.

PBV should not be confused with studies aimed at, and conducted for, the practicing manager. Instead, it is a contemporary theoretical perspective which has gathered momentum since the 1980s. This perspective endeavours to overcome bifurcation of the field between 'individualism,' which favours human action while ignoring macro-forces, and 'societism,' a concept that focuses on large social forces while discounting individual action (Whittington, 2006). In a recent review of this new perspective, Johnson, Melin, and Whittington (2003) proposed an 'activity-based view,'[9] focusing on the activities that organizational actors conduct (micro level), their consequences for organizational outcomes (macro level) and the feedback loop from contextual and organizational variables back to the actors. The authors argue that this approach does not replace traditional management theories such as the resource-based view or institutional theory, but rather provides what Bunge (1997) calls *a mechanismic* explanation for them.

[9] This term was later subsumed under a larger PBV approach.

According to Johnson et al. (2003), there is a fundamental difference between the 'content,' 'process' and 'practice' approaches in terms of the research questions asked, theories used and phenomena explained (for a summary see Table 3.1). Content theories such as upper echelon, the resource-based view or dynamic capabilities, provide conceptual explanations for organizational outcomes and focus mainly on firm performance. They prioritize nouns over verbs (Garud & Van de Ven, 2002) and employ constructs, which are too broad, too static and too convenient resulting in years of inconclusive empirical studies (Johnson et al., 2003). PBV scholars suggest that this lack of findings arises because the macro processes studied do not capture the micro processes of the actual practice (Nayyar, 1992). Indeed, if, according to the resource-based view, the source of a sustainable competitive advantage lies in a unique combination of valuable and rare assets, they should be studied not through large scale statistical studies but by uncovering their particularities and how they are utilized (Priem & Butler, 2001).

Table 3.1. Comparison of Management Studies Approaches

Approach	Research question type	Theories	What is studied?	What is explained?	Example
Content	What?	Mgt theories: resource-based view, dynamic capabilities	Organizational determinants	Firm performance	Barney, 1991; Hamel, 1991.
Process	How?	Process theories	Inputs + Process: org. as a whole	Firm level outcomes	Garud & Van de Ven, 2002
Practice	How (in more detail) and why?	Social theories of practice, sensemaking, discourse theories	Episodes of activities	- Outcomes of activities - Firm outcomes	Hendry & Seidl, 2003

Similarly, dynamic capabilities are often offered as another source of competitive advantage (Eisenhardt & Martin, 2000; Prahalad & Hamel, 1990; Teece, et al., 1997). Although management scholars suggest that to remain competitive, firms must continuously innovate to create new advantages (Dess & Picken, 2000; Tushman & O'Reilly, 1996), they fall short of explaining how this can be done. I suggest that organizational innovation capability is a type of dynamic capability, which resides in people, practices, and processes that enable innovation (Elkins & Keller, 2003; Mumford, Scott, Gaddis, & Strange, 2002). The PBV helps to uncover *how* innovation is accomplished and to identify plausible links with performance that could inform managerial action. It explores the distinction between potential and actual innovation, and highlights the role of practitioners in actualizing the latent economic value of innovation capabilities.

The difference between practice and process approaches is that the latter is concerned with processes in an organization as a whole. It attempts to explain how inputs are being transformed into outputs and usually relies on second-hand retrospective reports typically done by senior executives. A typical process theory holds that similar inputs transformed by similar processes will lead to similar outcomes; that there are certain constant necessary conditions for the outcome to be reached (Van de Ven & Poole, 1995). For example, Jacobsen and House (2001) employed the process theory to provide a dynamic view of charismatic leadership. Chuang (2007) applied the process theory based research methodology to analyze the characteristics of the innovation process in Taiwan's service companies. Kumara, Maheshwaria and Kumara (2002) adopted the process theory framework to delineate

the ERP (Enterprise Resource Planning) systems adoption process in Canadian government organizations.

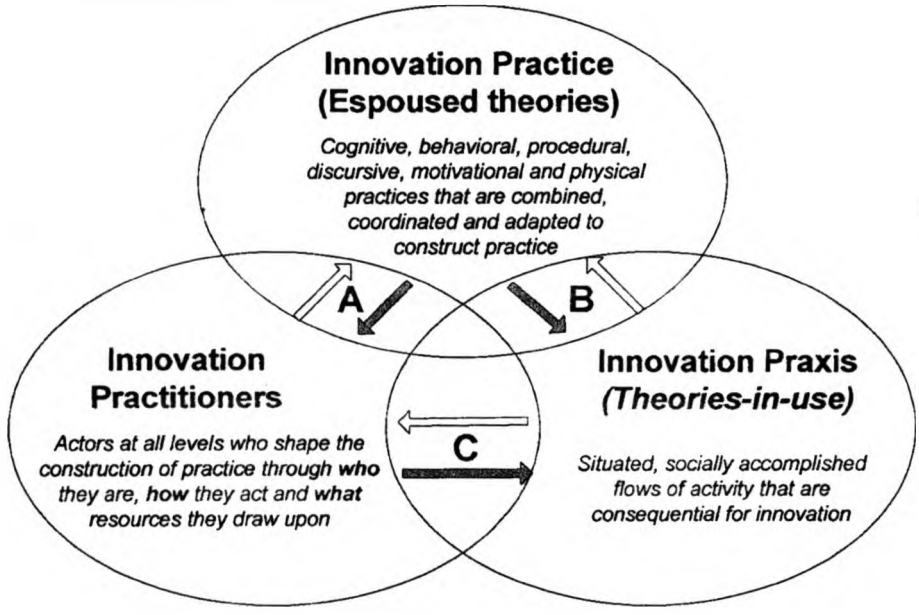
In process theory, typical patterns of events, such as variation and selective retention, are core theoretical constructs (Van de Ven & Poole, 1995). On the other hand, the practice approach peers *inside* the process (Brown & Duguid, 2000).

The latest developments in the field of PBV (Jarzabkowski, Balogun, & Seidl, 2007) propose to conceptualize any phenomenon as a situated, socially accomplished activity, which comprises actions, interactions and negotiations of multiple actors and the situated practices that they draw upon in accomplishing this activity (Jarzabkowski, 2005). Therefore, Innovation-as-Practice is conceptualized as a situated activity, and is considered to be innovative to the extent that it is consequential for innovation outcomes. PBV studies *episodes* of organizational activities (Hendry & Seidl, 2003) in order to uncover the mechanisms underlying the innovation practice. It asks questions such as "how is the conduct of a meeting consequential in terms of how innovation issues arise and gain momentum?"

Whittington (2006) proposes that three elements of the theory of practice should be isolated: practice, praxis, and practitioners. *Practice* represents the 'espoused theories' that guide this activity, such as shared routines of behaviour, norms and procedures that can be altered according to the activity in which they are used (Orlikowski, 1996; Seidl, 2007). *Praxis* refers to actual activities or, 'theories-in-use' (Argyris, & Schon, 1974) that constitute the fabric of innovation. *Practitioners* are those who actually perform praxis, be it leaders, middle managers or outside

agents such as consultants or customers, for what they actually do affects a company's innovation. These three elements are integrated parts of a whole called innovation (Figure 3.1).

Figure 3.1. Innovation-as-Practice



As depicted in Figure 3.1, innovative practitioners are innovation oriented leaders, executive and middle rank, who contribute to organization innovation in two ways: by establishing innovative practice and receiving feedback from it (A) and by engaging in innovative praxis through implementation efforts and sense-making (C). In turn, practice interacts with praxis (B), whereby the former conditions the latter, which, in turn, influences the first. In other words, the interaction between the three components of the framework is always bi-directional and innovation activity is accomplished by their combination.

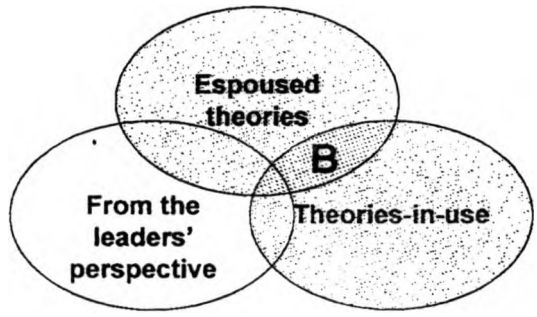
Much of the research on innovation fits in the category of *practice*. The theories of effective innovation espoused in the academic literature represent conceptual abstractions rooted largely in other established theories and limited phenomenological research. The latter, in turn, is usually based on survey instruments and secondary data and, as such, represents espoused innovation theories of practicing managers. The realm of espoused theories is usually referred to as a 'macro level' of theorizing. Only rarely, have observation methodologies been employed that would enable researchers to access the activity-level theories-in-use enacted in the workplace. Yet, it is at this 'micro level' that the managerial reality enfolds every day. Therefore a theory of innovation needs to connect the action (*praxis*) with the managerial and academic theories (*practice*) by understanding the role of agents (*practitioners*). This is exactly what this thesis endeavours to do.

The innovation framework in this thesis attempts to rectify this disconnect by combining a macro conceptualization and a micro, activity-level, explanation of organizational innovation. The macro aspect of the framework, grounded in content and process theories, prescribes the necessity of a comprehensive innovation strategy for achieving superior innovation outcomes. The micro aspect of the framework, rooted in the PBV, postulates the necessity of the congruence between espoused and enacted innovation strategies for achieving superior firm performance.

Johnson et al. (2007) suggest furthering empirical research by focusing on two elements of the framework with an overlapping area between them that is placed in the foreground while not forgetting other components, which are present but remain in the background. I follow this recommendation by focusing in this study on

espoused and enacted (theories -in-use) theories of innovation *as seen* through the eyes of the leaders (Figure 3.2). So the leaders serve as an access point to an organization. Data collection and the bottom-up analysis proceed at the individual, activity and firm levels.

Figure 3.2. Focus of This Study



The literature review presented in the previous chapter provides the necessary basis for developing a framework of comprehensive innovation practice grounded in the current state of academic knowledge in the field.

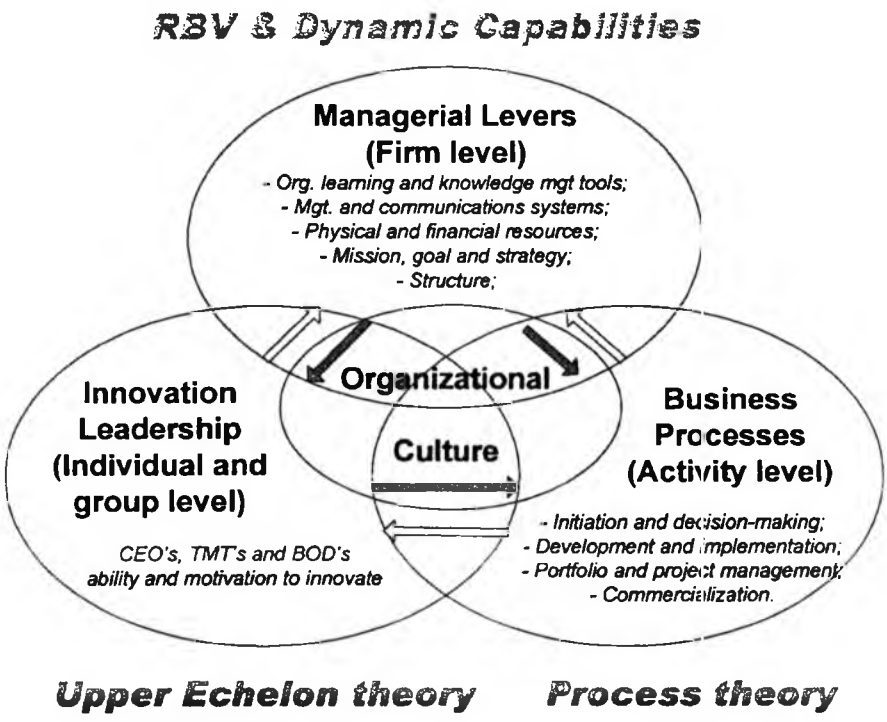
3.2 Conceptual Framework of Comprehensive Innovation *Practice*

Innovation *practice* is an espoused theory of innovation which includes shared routines of behaviour, norms and procedures (See Figure 3.1). In this section, I describe a comprehensive framework of innovation *practice* which provides an overarching structure that links different theoretical units into a coherent whole (Tsoukas, 1994). Four distinct meta-theoretical constructs (innovation leadership, managerial levers, business processes and culture) emerged from the existing literature (Figure 3.3). In line with the overall macro approach described above, these four meta-constructs are supported by content and process theories. Upper echelon

theory (Hambrick & Mason, 1984) has been traditionally used to connect agents' characteristics and behaviors with organizational outcomes; however it cannot sufficiently cover innovation business practices, processes and culture because it focuses on the individual level and not on the firm level variables. On the other hand, dynamic capabilities research (Eisenhardt & Martin, 2000; Prahalad & Hamel, 1990; Teece et al., 1997) is concerned with organizational resources and capabilities but falls short of fully incorporating the role of the agent or investigating how organizational processes transform inputs into outputs, which is the realm of organizational process theory (Engeström, 1993; Van de Ven & Poole, 1995). Therefore, each meta-construct of this conceptual framework requires a distinctly separate theoretical basis. Next, I present the theoretical development of each meta-construct and provide rationale for the *necessity but insufficiency* of each component for the comprehensive model. I conclude that all components of the framework collectively have the potential to deliver *sustainable innovation outcomes*, which can then serve as a basis for consistent short and long term performance.

Starting from innovation leadership, the argument follows the framework clockwise.

Figure 3.3. Conceptual Map of Innovation Practice



Innovation Leadership is a type of leadership oriented towards innovation. It is represented by a meta-construct consolidating individual and group level variables. Various studies have reported that executives explain about 5 to 20% of variance in company profitability (Crossland & Hambrick, 2007) and their influence on innovation has been captured in a special issue of *The Leadership Quarterly* (2004:15) dedicated to the subject of leadership for innovation. Mumford and Licuanan (2004) summarized the findings presented in this issue by confirming the multiple roles of leaders. Not only is their support and guidance vital in promoting innovative efforts at the initial creative stage, as it contributes to the effective interactions among group members (West, Borrill, Dawson, Brodbeck, Shapiro, & Haward, 2003), but of equal importance is a leader's ability to create conditions for the subsequent implementation of innovation (Mumford & Licuanan, 2004).

Upper echelon theory proposes that leaders' behaviors are a function of their values, experiences and personalities (Hambrick & Mason, 1984). Mumford et al. (2002) argue that to lead creative efforts, leaders must possess substantial technical and professional expertise and creative skills, as well as the ability to process complex information. Moreover, they must have the motivation to exercise this ability. According to Sternberg, Kaufman, and Pretz (2003), this motivation partially depends on leaders' perceptions of environmental threats and opportunities.

I consolidate leaders' ability and motivation to innovate in the construct *Innovation Leadership,* which includes psychological and demographic factors of the individual and group levels that drive innovation.

At the individual level, scholars identify psychological and behavioral characteristics which support innovation activities. For example, leaders' independence (Patterson, 1999; West, 1987), self-confidence (Barron & Harrington, 1981), proactivity (Seibert, Kraimer, & Crant, 2001), personal initiative (Frese & Zapf, 1994), intrinsic (versus extrinsic) attribution bias (Frese, Teng, & Wijnen, 1999; West, 1987), and determination to succeed (Amabile, 1983) ensure that the innovation practices are established, while their authoritarianism (Simonton, 1991) guarantees that innovation processes are maintained. Leaders' originality (Patterson, 1999; West & Wallace, 1991), unconventionality (Frese et al., 1999; West & Wallace, 1991), tolerance of ambiguity (Barron & Harrington, 1981; Patterson, 1999) and change (Damanpour, 1991), and openness to experience (George & Zhou, 2001; Patterson,

1999; West, 1987) promote creation of an innovation culture in which calculated risk taking and experimentation are encouraged.

Additional innovation stimulating factors exist at the group level. Upper echelon theory suggests that composition and characteristics of the top management team (TMT) yield a stronger explanation of organizational outcomes than a leader's characteristics alone. For example, diversity of the TMT's (Bantel & Jackson, 1989) and Board's (Goodstein, Gautam, & Boeker, 1994) background and experience, and extra-industry ties (Geletkanycz & Hambrick, 1997) will provide the necessary sources of innovative ideas for the leadership. Additionally, team composition and climate impact performance of collaborative teams (Anderson & West, 1998; Katz, 1988; Thamhain & Wilemon, 1987).

The *Innovation Leadership* construct is linked with organizational and contextual factors through *Managerial Levers* that play direct and indirect roles in enabling innovation. Leaders implement deductive innovation strategies (Regnér, 2003) through direct levers such as decisions and actions taken by leaders to deliver innovation. Senior executives exercise indirect leadership (Jansen et al., 2009) to guide innovation champions at the middle management level in their implementation of *Business Processes* that support innovation. In sum, *Managerial Levers* link individual or group determinants with organizational factors and provide the necessary, but usually missed, connection between leadership intentions and organizational results.

At the same time, *Innovation Leadership* alone is not sufficient to deliver sustainable innovation outcomes. Even innovative leaders may lack the power or ability to exercise their managerial levers, establish an innovative climate and develop business processes that support innovation (Krause, 2004). Alternatively, they may employ their levers but due to ineffective indirect leadership their influence fails to cascade to the middle and lower levels where processes are taking place (Bower & Gilbert, 2007). Some leaders may prefer a structured environment and thus exercise their managerial levers and develop business processes supporting innovation while paying little attention to nurturing an organizational climate receptive to innovation. This attitude may lead to a low motivation of the employees (Koberg, Uhlenbruck, & Sarason, 1996). As a result of the deficiencies in other components of the framework, the innovation outcomes will be curtailed.

Proposition 1: Innovation Leadership is necessary but insufficient for achieving sustainable innovation outcomes.

Managerial Levers are levers that leaders use to enable innovation. It is represented by a meta-construct consolidating firm level variables supporting innovation. This construct can be best conceptualized using the theory of dynamic capabilities (Eisenhardt & Martin, 2000; Prahalad & Hamel, 1990; Teece et al., 1997), a dynamic strain of the resource-based view (Barney, 2001) that draws on evolutionary economics (Nelson & Winter, 1982; 2002), according to which different resource bases are the source of 'variation' among firms through innovations. The new products are then 'selected' by the market place. The firm's task is to combine exploitation of the existing resources while searching for new opportunities

(exploration). However, continuous changes in the environment and the competitive landscape may lead to 'creative destruction' (Schumpeter, 1934) of the currently valuable resources. Therefore, a firm should not only exploit existing resources, but also develop new and valuable resources and capabilities (Rumelt, 1984). This takes time, investment and managerial effort (Dierickx & Cool, 1989).

Scholars argue that innovation is paramount in a modern environment characterized by hypercompetition (D'Aveni, 1994). Intense and rapid competitive moves require firms to continuously innovate to create new advantages (Dess & Picken, 2000; Tushman & O'Reilly, 1996). In other words, dynamic capabilities are a source of competitive advantage (Eisenhardt & Martin, 2000; Prahalad & Hamel, 1990; Teece et al., 1997) that must be commensurate with the dynamic nature of the environment.

Scholars have suggested that an organization's propensity to innovate or to adopt innovations is a type of dynamic capability which contributes to competitive advantage (Helfat et al., 2007). For example, dynamic innovation capabilities of continually preempting competitors by introducing new products and technologies helped Intel and Rubbermaid sustain their 'evolutionary fitness' in the market for many years (Helfat et al., 2007: 12, 49). Some dynamic capabilities support incremental process innovation and lead to experience related cost reduction (Sinclair, Klepper, & Cohen, 2000). Others, such as drug related innovations, may create and expand new market segments (Bottazzi, Dosi, Lippi, Pammolli, & Riccaboni, 2001).

I propose that dynamic innovation capabilities reside in managerial levers that enable innovation (Elkins & Keller, 2003; Mumford et al. 2002). There are different types of managerial levers. Organizational vision, mission and strategy establish direction for the organization to follow (Adams et al., 2006). Physical and financial resources; performance management and communication systems provide the necessary support for innovation practices (Damanpour, 1991). Organizational learning and knowledge management tools help maintain innovation processes (Crossan, Lane, & White, 1999).

In terms of resource allocation, the factors include absolute and relative R&D intensity (Parthasarthy & Hammond, 2002), commitment to differentiated funding (White, 2002), annual turnover of resources (Mohr, 1969), and slack resources (Damanpour, 1991; Kanter, 1983; O'Brien, 2003).

Leaders create a rewarding environment by providing support for experimentation (Damanpour, 1991; King, Anderson, & West, 1992; West & Anderson, 1992); by being tolerant of failed ideas (Madjar, Oldham, & Pratt, 2002); by adopting risk-taking norms (King et al., 1992; West & Anderson, 1992); by supporting learning and development of employees; and by fostering the acceptance of diversity within the group (Crossan & Hulland, 2002).

Knowledge management systems that enable innovation include the usage of formal idea generation tools (Cebon & Newton, 1999; Loch, Stein, & Terwiesch 1996), external linkages with universities (Atuahene-Gima, 1995) and the quality of these linkages (Cebon & Newton, 1999), formal information gathering (Oliver,

Dewberry, & Dostaler 1999) and customer contact time and frequency (Lee, Son, & Lee, 1996).

However, similarly to the *Innovation Leadership, Managerial Levers* alone are not sufficient for achieving sustainable innovation outcomes. In the absence of *Innovation Leadership, Managerial Levers* established by previous innovative leaders might be discontinued (Bigley & Wiersema, 2002). Even if innovative leaders do establish managerial levers that support innovation, ineffective indirect leadership may prevent them from cascading to the middle and lower levels where innovation processes take place (Bower & Gilbert, 2007). So, as a result of deficiencies in other components of the framework the innovative outcomes could be curtailed.

Proposition 2: Managerial Levers supporting innovation are necessary but insufficient for achieving sustainable innovation outcomes.

Managerial Levers enable *Business Processes* in a firm.

Business Processes are processes inside a firm that support innovation. It is represented by a meta-construct which consolidates process level variables. This meta-construct is arguably the most developed in the literature within the framework of the process theory (Engestrom, 1993; Engestrom, Engestrom, & Suntio, 2002, Van de Ven & Poole, 1995), which studies how organizational processes convert inputs into outputs.

The word 'process' has a wide range of meanings and thus we start by clarifying its application in this dissertation. According to Van de Ven and Poole (1995), the term 'process' is used in management literature to refer to: 1) the underlying logic that explains a causal relationship between independent and dependent variables in the variance theory, 2) a category of concepts of organizational actions, such as rates of communications, work flows, decision making techniques, or methods for strategy making; and 3) the progression (i.e., the order and sequence) of events in an organizational entity's existence over time. I use the second interpretation of the word when referring to *Business Processes*.

The process approach has a long history in several areas of social sciences: from Marx' and Braveman's labor process theory (Knights & Willmott, 1990) to process theories of human behavior (motivational theories: Adams, 1963, 1965; Kahler, 1975; Locke, 1968, 2001; Vroom, 1964) and cognition (information processing theory: Miller, 1956).

A typical process theory holds that similar inputs transformed by similar processes will lead to similar outcomes; that there are specific necessary conditions for the outcome to be reached. Thus a process level explanation identifies the generative mechanisms that cause observed events to happen in the real world, and the particular circumstances or contingencies when these causal mechanisms operate (Tsoukas, 1989; Harré & Madden, 1975).

In the process theory, typical patterns of events are core theoretical constructs (Van de Ven & Poole, 1995). In the context of innovation, these core processes

include the initiation of innovation (Gopalakrishnan & Damanpour, 1997), development and implementation of innovation (Wolfe, 1994; Zaltman, Duncan, & Holbek, 1973), portfolio and project management, and commercialization (Adams et al., 2006).

According to Gopalakrishnan and Damanpour (1997), an innovation can be initiated in an organization either by a generation or an adoption. The generation of innovation revolves around problem solving and decision-making related to the development of new products and processes. The adoption of innovation, on the other hand, is a process of induction of organizational change from outside. Organizations may of course engage in either, the generation or the adoption of innovations, or in both. As a result, an organization is said to have a portfolio of innovation projects.

The focus of portfolio management is on making strategic, technological and resource choices that govern project selection and the future shape of the organization (Cooper, Edgett, & Kleinschmidt, 1999). Portfolio management is important because of the rapidity at which resources are consumed in the innovation process (Cebon & Newton, 1999). The effectiveness with which an organization manages its R&D portfolio is often a key determinant of its competitive advantage (Bard, Balachandra, & Kaufmann, 1988).

Development and implementation of innovation sequentially follows innovation generation or an adoption decision (Wolfe, 1994). Project management, problem-solving, and design and development occur in certain subunits within the organization (e.g. R&D, design, engineering). Project management is concerned with

the processes that turn the inputs into a marketable innovation and is comprised of both sequential and concurrent activities. Adams et al.'s (2006) review found that the key success factors of an effective innovation project management are project efficiency, tools, communications and collaboration.

Marketing and commercialization are the final innovation processes. They involve the management and administrative cores of the organization (Adams et al., 2006). Commercialization is concerned with making the innovative process or product a commercial success and it is important for the survival and growth of organizations. Commercialization includes market research (Verghaeghe & Kfir, 2002), budget for market testing (Balachandra & Brockhoff, 1995), marketing proficiency such as number of product launches (Yoon & Lilien, 1985), launch proficiency (Song & Parry, 1996), personnel proficiency, post-launch reviews (Atuahene-Gima, 1995); and adherence to schedule (Griffin & Page, 1993). According to Adams et al. (2006), commercialization is the least developed area of innovation management as it is often considered the domain of other specialists, particularly marketers. However, I concur with Adams et al. (2006) that without including commercialization, the innovation cycle is not complete.

Similar to the previous two meta-constructs, *Business Processes* alone are not sufficient for achieving sustainable results. For example, R&D teams might be carrying on business processes supporting innovation but if their initiatives do not find support at the senior executive or organizational level, these processes might be short lived (Burpitt & Bigoness, 1997). Alternatively, business processes might be the remnants of the previous innovative leadership that the current leadership does not

support (Bigley & Wiersema, 2002). Even if innovative leaders would like to support business processes, they might not have power or ability to establish proper managerial levers or develop an innovative climate (Haakonsson, Burton, Obel, & Lauridsen, 2008). So, as a result of deficiencies in other components of the model the innovative outcomes will be curtailed.

Proposition 3: Business Processes supporting innovation are necessary but insufficient for achieving sustainable innovation outcomes.

Innovation Culture. *Innovation Leadership, Managerial Levers* and *Business Processes* supporting innovation interact with each other through *Innovation Culture*, which is characterized by a clearly stated, attainable, shared vision (Pinto & Prescott, 1988; West, 1990), individual autonomy (Amabile, 1998; Zien & Buckler, 1997), calculated risk taking (West, 1990) and motivation (Miller & Friesen, 1982).

In line with the arguments in the preceding sections, *Innovation Culture* alone will not be sufficient to deliver sustainable outcomes. Without *Innovation Leadership*, innovative efforts at the initial creative stage will be stalled (West et al., 2003), and conditions for the subsequent implementation of innovation will not be created (Mumford & Licuanan, 2004). Although *Innovation Leadership* and *Culture* might be present, the absence or ineffectiveness of *Managerial Levers* will impede the establishment of necessary *Business Processes* that support innovation. Even if the *Managerial Levers* and *Business Processes* are established, the absence of an innovative climate may stall overall innovative efforts (Klein & Sorra, 1996).

Proposition 4: Innovation Culture is necessary but insufficient for achieving sustainable innovation outcomes.

The comprehensive theoretical model developed in this thesis posits that the synergistic effects of *Innovation Leadership, Managerial Levers* and *Business Processes* supported by *Innovation Culture* deliver innovation outcomes leading to performance. The propositions developed earlier suggest that each individual component is necessary but not sufficient to deliver sustainable results on its own. Therefore, I propose that *all* four components of the framework – leadership, managerial levers, business processes and culture – are necessary to achieve superior innovation outcomes because of the reinforcing nature of the elements. The more narrow focus of prior research obscures the vital connectivity between these essential areas. For example, while there is a body of research that has examined innovation processes, largely in the form of new product development, it has neglected to examine key managerial levers that set the context for such processes. The processes of ideation or commercialization will be stifled if the managerial levers of reward and management or organization structure are not aligned with those processes. Similarly, if there is no leadership support for innovation processes, they are unlikely to succeed.

Overall, should one or two components of the model be underdeveloped, the innovation outcomes will be sub-par with respect to the full model. Let us consider if only one component is missing. Without leadership support for innovation, managerial levers and business processes, even if they existed, would be short lived (Bower & Gilbert, 2007). Alternatively, the absence of established managerial levers may indicate leaders' inability (either lack of power or ability) or unwillingness

(because of their managerial preferences) to institutionalize innovation thus leading to sporadic spikes of innovative activities across the organization and a lack of continuity. On the other hand, strong innovative leadership and established managerial levers will remain unfulfilled without innovation processes that facilitate execution (Roberto & Levesque, 2005). Yet, even the presence of innovative processes without an appropriate climate supporting risk taking, experimentation, and improvisation (Patterson et al., 2005) will fall short of the full potentiality of a comprehensive framework.

If two or more components of the framework are underdeveloped, the results will deteriorate even further. Table 3.2. describes the various combinations of missing components and their expected effect on innovation outcomes.

Table 3.2. Relationship between Model Components and Outcomes

Leaders	Levers	Processes	Climate	*Possible Outcomes*
No	No	No	No	*No innovation*
Yes	No	No	No	*Although leaders are innovative, they lack power and/or ability to employ managerial levers, climate and develop business processes*
No	Yes	No	No	*Managerial levers that support innovation were established by previous innovative leaders, meanwhile current leadership do not see it as a priority*
No	No	Yes	No	*Middle management (e.g. R&D teams) is carrying on innovative processes but their initiative does not find support at the senior executive or organizational level*
No	No	No	Yes	*This situation is hard to imagine as without either senior or middle management support innovative climate even if existed before would be short lived*
Yes	Yes	No	No	*Innovative leaders are able to use their direct power to establish managerial levers but due to ineffective indirect leadership*

				their influence fails to descend to the middle and floor level where business processes are taking place
Yes	No	Yes	No	*Leaders support the innovation champions such as R&D but don't have enough power or managerial ability to institutionalize managerial levers*
Yes	No	No	Yes	*Leaders prefer non-formal environment and thus support innovative climate but avoid formalizing it leading to sporadic developments and lack of continuity*
Yes	Yes	Yes	No	*Leaders prefer formal environment and thus formalize managerial levers and business processes while paying little attention to climate leading to low motivation of the employees*
Yes	No	Yes	Yes	*Leaders support business processes and create climate yet shy away from institutionalizing managerial levers either because they see innovation as a 'natural' process not needing structure or because of their inability to do so due to the lack of resources and/or skills*
No	Yes	Yes	Yes	*A previously fully innovative organization gets a new leadership which favours more steady company development resulting in stalled innovative outcomes*
Yes	Yes	Yes	Yes	*Innovation is supported at all levels creating a positive feedback loop which supports innovative outcomes*

Propositions 1-4 postulate necessity but insufficiency of each individual component of the framework. The forgoing discussion in this section further demonstrates the need for a comprehensive framework for sustainable results.

Proposition 5: A firm demonstrating innovation in all the components of the comprehensive framework (leadership, managerial levers, business processes and culture) will achieve sustainable innovation outcomes.