

Beyond RBV and KBV to an Innovation-Based View of the Firm

Dr. Gabriel J. Costello
Galway-Mayo Institute of Technology
Galway, Ireland
Gabrielj.Costello@gmit.ie

Prof. Brian Donnellan
Professor of Information Systems Innovation
National University of Ireland Maynooth
Maynooth, Co. Kildare, Ireland
Academic Director, Innovation Value Institute
National University of Ireland, Maynooth
Brian.donnellan@nuim.ie

ABSTRACT

The quest to understand sources of sustained competitive advantage is still a major area of interest to both researchers and practitioners. The central thesis of this paper is that the resource-based view of the firm and the knowledge-based view of the firm require updating to an innovation-based view. This novel hypothesis of the firm is informed by a review of relevant literature and an empirical study of innovation management. The ICT revolution has a major impact on business and society resulting in an opening of the firm's boundaries and increasing the digitalization of organizations. We utilize a grounded theory approach to the case study based in the Irish subsidiary of a multi-national corporation where innovation emerged as a key differentiator. Five empirical indicators of a firm's propensity to harness innovation in order to generate sustained competitive advantage are proposed: management of paradox, degree of openness, the dilemma of initiation and implementation, non-technological nature and technological nature. The paper contributes to advancing theory by advocating and developing an innovation-based view of the firm. Such a view is needed as innovation is now regarded by scholars and practitioners as being the driver of competitive advantage for the modern organization.

Keywords: Innovation, knowledge transfer, culture, multi-national corporations, strategic management, theories of the firm

INTRODUCTION

Current theories of the firm in use in business research—the resource-based view (RBV) and the knowledge-based view (KBV)—need updating due to the growing importance of innovation to firms and their subsidiaries. Using the methodology of grounded theory, this paper examines innovation management in an Irish subsidiary of American Power Conversion (APC). Ireland's economy has grown considerably over the past two decades and much of this growth is due to foreign direct investment (FDI) from North American MNCs. Many MNCs initially set up manufacturing bases in Ireland because the country was a low cost economy. However, this is no longer the case. As a result, Irish enterprises face the necessity of building new sources of competitive advantage to sustain employment and standards of living. Ireland is now entering a new era which requires a transition to an innovation economy (Porter, 2003).

Schneider Electric recently acquired APC and has added the subsidiary to its critical power and cooling portfolio. It had two locations in the West of Ireland that serve the European, Middle East and Africa (EMEA) region. With the continuing transfer of many of the company's products to low cost locations such as the Philippines and China, the Irish operations need to become a corporate leader in the area of innovation in order to ensure the long-term sustainability and development of the location.

Having set the scene, the paper now proceeds as follows. Firstly, a literature review is provided which illustrates the economic importance of shifting attention from resources and knowledge to innovation. The following section outlines the research approach. The study employs a longitudinal case study that examines innovation management in the Irish subsidiary. Next, the article presents and discusses the case study findings in terms of the central theme of the paper. The final section proposes a new theoretical perspective: an innovation-based view of the firm (IBV).

LITERATURE REVIEW

This section argues that competitive advantage in the modern business environment stems from a firm's ability to harness its innovation potential. This view postulates the need to shift attention from resource and knowledge capabilities and focus more on innovation capabilities. Thus, the RBV and the KBV of the firm need to be updated. This literature review provides an overview of the development of the KBV from the antecedent work on the RBV. The literature on innovation is copious. Thus, for the purpose of this paper, Katz's (2004) concept of "opposing logics" is used to organize the presentation of the innovation literature. The open-innovation model and its consequences for where knowledge now resides is then discussed. Finally a figure is presented of the chronological development of the information systems (IS) discipline that conceptualizes the implications of an IBV for this field.

From RBV to KBV

Theories of the firm are conceptualizations and models of business enterprises which explain and predict their structures and behaviors. As a result, there are many theories of the firm which both compete in offering rival explanations of the same phenomena and complement one another in explaining different phenomena. One theory of the firm is the KBV. In this view, the firm is conceptualized as an institution for integrating knowledge (Grant, 1996). The KBV posits that knowledge is the most strategically important of the firm's resources. The ability to produce unique or low cost products and services is due to superior knowledge. With knowledge firms become more efficient and effective with the use of scarce resources. This view is gaining increasing attention due to the rapid movements towards knowledge-based economies. The KBV of the firm is an outgrowth of the RBV of the firm. The RBV perceives the firm as a unique bundle of idiosyncratic resources and capabilities where the primary task of management is to maximize value through the optimal deployment

of existing resources and capabilities, while developing the firm's resource base for the future (Barney, 1991). The KBV would argue that maximizing the value deriving from the firm's resources builds from superior knowledge.

Grant (1996) views knowledge as residing in the individual and sees the primary role of the organization as knowledge application rather than knowledge creation. Other authors supporting the KBV see the role of the firm as being the acquisition and creation of organizational knowledge (Nonaka, 1994; Spender, 1996). These two standpoints are inconsistent with each other. Grant (1996) dispenses with the concept of organizational knowledge in favor of emphasizing the role of the individual in knowledge creation. Wenger (2004) identifies the importance of the individual and observes that all knowledge creation and learning occurs in the mind of the individual. The danger inherent with the concept of organizational knowledge is that the organizational processes through which individuals engage in these activities may be obscured, by their viewing the organization as an entity that creates, stores and deploys knowledge (Coakes, (2000)). The organizational processes that integrate knowledge need explication—in particular, research is necessary to understand where knowledge workers turn to for advice, whether internally or across organizational boundaries, and exactly how they access that advice (Wasko & Faraj, 2005).

Drucker (1988), Grant (1996), and Spender (2003) suggest that knowledge is perhaps the only true source of competitive advantage. However, Carlsson (2003) purports that storing a firm's knowledge in an IT system does not create competitive advantage. Rather the firms' ability to effectively create new knowledge and to employ the existing knowledge to solve problems, make decisions, and take actions, forms the basis for achieving competitive advantage. According to Grant (1996), competitive advantage stems from how effective firms are at integrating the specialized knowledge of their members, and he proposes that this

ote>¶ (Porter, 1998)¹ • • Ambidextrous • Focused • !! ADDIN EN.CITE

Efficiency of integration relates to the costs of combining multiple types of knowledge into goods and services. For example, if individuals in the firm share a common knowledge (e.g., specialists in chemical engineering) they will be more efficient in integrating their knowledge. If they have entirely separate knowledge bases, then integration cannot occur except at a very basic level. Scope refers to the different types of specialized knowledge being integrated - the broader the scope of knowledge being integrated, the more difficult for competitors to replicate. Flexibility of integration reflects extending existing capabilities through boundary spanning activities in order to access and reconfigure additional knowledge through both internal and external integration. Grant (1996) further suggests that organizational capability depends more on the integration mechanism than on the specialist knowledge that employees possess, thus research should focus on the difficulties of coordinating knowledge among individuals instead of producing cooperation.

Leonard (1998) links the KBV to innovation and claims that the successful innovators are organizations that build and manage knowledge effectively. They are the most enthusiastic about pursuing knowledge and the most likely to harness the power of innovation. Leonard illustrates the dimensions of the core capabilities along which all organizations must innovate: physical systems, managerial systems, skills, and norms of behaviors. She views organizations as sites of learning and information transfer rather than physical sites or financial entities. The workforce of a forward-looking organization must be able to process and manipulate knowledge as well as perform particular skills. Top management should encourage creative chaos among disciplines within the organization and benchmarking with competitors.

Having briefly traced the development of KBV from RBV and linking this development to the innovation debate, the article now examines how the innovation literature informs the management perspective within the firm.

The Opposing Logics of Innovation Management

Many scholars trace the introduction of innovation into the realm of economic and social change to Joseph Schumpeter's seminal work on the "Theory of Economic Development" (Schumpeter, 1934). Schumpeter classifies innovation into five categories: new products (or goods), new methods of production (or processes), new sources of supply (or half-manufactured goods), the exploitation of new markets, and new ways to organize business. In Schumpeter's original schema, innovation is accomplished by entrepreneurs who develop new combinations of existing resources (Swedberg, 1991). However, in his later works, he regards the large corporation as the innovative engine driving the development of leading economies (Lazonick, 2005). The voluminous and eclectic innovation literature is described by Adams, Bessant, & Phelps (2006) as a fragmented corpus. Recently, there have been some noteworthy attempts to provide a more holistic appreciation of the innovation landscape such as the compilations by Fagerberg, Mowery, & Nelson (2005) and by Shavinina (2003). In this paper, an attempt is made to parse the literature using the perspective which Katz (2004) proposes. He presents the problem in terms of opposing logics. This requires organizations to be operationally efficient in the present while also trying to innovate successfully for the future. Katz further points out that the main issues facing innovation managers are not in the technical arena but those which relate to the complex interplay and motivation of the people involved. Other scholars suggest that companies must become ambidextrous in order to deal with these opposing logics (O'Reilly & Tushman, 2004). In a recent book, Martin (2007) refers to this paradox as 'the opposable mind.' Table 1 presents some of the innovation paradox theories which this paper builds implicitly on.

Table 1 here.

A major source of research on innovation management emanates from the Cranfield School of Management where Tidd, Bessant, & Pavitt (2005) propose that innovation must not be seen as a lottery but as a continuous improvement process. Much emerging research draws attention to innovation successes and failures. As a result, a number of models have been developed which aim to assess innovation management performance. In order to provide some initial reference points on innovation management, Tidd *et al.* (2005) provide an assessment tool and audit framework. Such a benchmarking tool is widely used in the area of total quality management (TQM), an example being the Malcolm Baldrige National Quality Award. The framework proposes five dimensions to assess and profile innovation management: strategy, process, organization, linkages and learning (Tidd *et al.*, 2005 p 568). In associated work, Goffin & Mitchell (2005) propose the analogy of a pentathlon which consists of five areas: innovation strategy, ideas, prioritization, implementation, people and organization. However this challenge of managing opposing logics must be viewed against the backdrop of recent paradigmatic changes in the business landscape. The following section discusses these changes.

Changing Business Paradigms

Chesbrough (2003) argues that in many industries the centralized approach to research and development (R&D), which he terms closed innovation, has become obsolete. He argues that the closed innovation paradigm must be replaced by open innovation whereby ideas and knowledge from outside the company are adopted in conjunction with internal processes. The factors influencing this change are: the mobility of skilled people, the increasing presence of venture capital, the emergent high-tech start-ups and, the significant role of university research. The success of companies such as Cisco and Intel has been attributed to their adoption of this new paradigm. In contrast, many believe that the decrease in Xerox's innovation capacity is due to the company's reliance on a closed R&D system. Chesbrough

argues that embracing external ideas and knowledge will actually multiply the advantage of internal efforts. However, connecting external innovation to internal innovation requires a new business model with the following six functions:

- Articulate the value proposition
- Identify a market segment
- Define structure of your value chain
- Specify revenue generation mechanisms and estimate cost structure and target margins
- Describe firms position in value network of suppliers and customers
- Formulate the competitive strategy

Implementation of the business model can be greatly accelerated by buying and selling intellectual property (IP). However, there always remains the hard work of converting research ideas into products and service that solve customer's problems. Interestingly he states that the presence of manufacturing, distribution and brand are assets that help the firm retain some of the value it creates. Figure 1 shows an innovation funnel adapted to illustrate an open innovation model.

Figure 1 about here

The growing significance of the Open Innovation paradigm has prompted West, Vanhaverbeke and Chesbrough (2006) to propose a research framework with the following classifications: individual, organizational, value network, industry/sector and national institution (p.288). In related work, Vanhaverbeke and Cloudt (2006) suggest that emerging forms of value networks must be examined at the level of different nested layers. These diverse layers span the spectrum from the individual; to firms-organizations; through Dyads; onto inter-organizational networks and ultimately reaching to national/regional innovation systems.

In antecedent related research, von Hippel (2005) speaks about the democratization of innovation where product and service users increasingly have the ability to innovate for themselves. This results in a move from manufacturing-centric to user-centric innovation processes. Christensen, Yang, Verlinden, & King (2005) note that the old theories of innovation may no longer be relevant to future performance. In their study of the Semiconductor industry, they find that Moore's Law is no longer the dominant paradigm for analyzing this sector. Customers are less concerned about performance factors such as clock speed and more focused on new parameters such as convenience and customization. Furthermore, they contend that new specialized non-integrated firms will provide a serious threat to the incumbents. One way the Semiconductor industry can manage these transitions is to adopt disruptive-innovation and value-migration frameworks. Now we will examine the enormous changes that the revolution in ICT (information and communications technology) has brought to the firm and its environment.

The ICT revolution and the Digitalization of the Firm

The spectacular growth of the internet, ubiquity of networking, globalization of business and evolution of information economies has resulted in novel business processes and new ways of sharing knowledge. These transformations are resulting in the development of the fully digital firm (Laudon & Laudon, 2002). Other ICT technologies include mobile computing, teleworking, Web 2.0, social networking and open source that affect not only business but society. ICT has resulted in process innovations in the firm affecting logistics, manufacturing, sales and order management, finance, human resource management as well as the support activities of design, engineering and marketing (O'Brien & Marakas, 2009; Post & Anderson, 2003). According to Robson (1997) , “quality, innovation and service are now more important than cost, growth and control” (p 273). She also goes on to propose four forces for openness (a topic we will discuss in more detail later): new technology, new geo-political order and new enterprises. Furthermore Robson provides the following taxonomy of the evolution of the firm:

- *Efficiency* was the price of staying in business in the 1960s
- *Effectiveness* was the price of staying in business in the 1970s
- *Competitiveness* was the price of staying in business in the 1980s
- *Adaptability* was the price of staying in business in the 1990s

We argue that:

- *Innovation* is the price of staying in business in the 2000s

As Pfaffenberger (2002) puts it "The internet has emerged as an un-paralleled public medium for communication and commerce-and its changing our world".

From a management information systems (MIS) perspective, another paradigmatic shift has been the growth and diffusion of self-service technology (SST). An increasing number of business and government transactions are now being completed without human assistance.

Consequently, an argument exists that self-service technology and business extends the traditional boundaries of the customer service function (Costello & Donnellan, 2007).

Figure 2 diagrammatically captures the argument proposed by this paper by building on the three-era model of Ward, Griffiths, & Whitmore (1990) and showing the discipline entering a fourth era where the main business driver is innovation.

Figure 2 about here.

Where Open Innovation meets IT

Innovation research is being undertaken in the Innovation Value Institute (IVI, 2011). Applying the principles of engaged scholarship (Mathiassen & Nielsen Peter Axel, 2008; Van de Ven A.H., 2007), innovation is being investigated using a design process with defined review stages and development activities based on the Design Science Research guidelines advocated by Hevner, March, Park, & Ram (2004). During the design process, researchers participate together with practitioners within research teams to capture the views of key domain experts. The Innovation Capability Maturity Framework extends directly the approach proposed by the Information Technology Capability Maturity Framework (IT-CMF) introduced and described in (Curley, 2004; Curley, 2006; Curley, 2007). Also the research approach is significantly influenced by the emerging research area of engaged scholarship (Mathiassen et al., 2008; Van de Ven A.H., 2007). We will now describe the innovation dilemma which featured in research on innovation in the 1960s and 1970s. Our aim is to rehabilitate the concept as we believe it is as important as ever in the debate.

The Innovation Dilemma

The *innovation dilemma* highlights the tension between the two main phases of innovation: initiation and implementation, and is an important concept to consider when dealing with the subject of innovation. According to Zaltman *et al.* (1973) the most important contribution by James Wilson (1966) as part of his theoretical work on innovation in the 1960s was the identification of the *innovation dilemma* which organisations face during the process of innovation. Wilson had concluded that it is easier to initiate than implement innovations by stating that it is “easier to increase the organizations capacity to generate new proposals than it is to increase its capacity to ratify any given proposal” (Wilson (1966) cited in Zaltman *et al.* p. 178). Wilson had taken into account the characteristic of *complexity* but however did not consider *formalization and centralization*.

The second generation innovation dilemma proposed by Zaltman *et al.* is conceptualised by the authors in the figure below. The initiation stage is characterised by higher complexity with lower formalization and centralization. However the implementation stage is characterised by lower complexity and higher formalization and centralization. Hence the challenge for an organisation to balance these opposing forces where mediating factors include interpersonal relations and the ability of the organisation to deal with conflict.

Figure 3 about here

The innovation dilemma has been presented as it is relevant to innovation theory in that it highlights the tension between the initiation and implementation stages. Now we will examine some theoretical considerations when viewing RBV, KBV and the proposed innovation-based view.

The Role of Theory

At this stage we want to address the question; does a new innovation-based view of the firm usurp the previous RBV and KBV views. To answer this we will call on a seminal paper by Thomas C. Chamberlin (1890) (sic) written in the very stylized prose of that era, which continues to be influential. Chamberlain's introduces his "method of multiple working hypotheses" by dividing research into two broad categories. The first path he calls "secondary, imitative, or acquisitive study" which involves closely following the process developed by previous scholars. The second category is described as "primary or creative" study where the approach is to "think independently, or at least individually, in the endeavor to discover new truth". Furthermore, the latter is the most promising avenue for research in subjects "which, while much is known, more remains to be known". Chamberlin then delineates three "intellectual methods" that have driven the progress of science: the method of ruling theory, the method of the working hypothesis and the method of multiple working hypotheses. He argues convincingly for the universal adoption of the last method in his paper. The dominance of "affection for the favored theory" causes a narrowing of vision and possibilities; which results in the stiling of research and errors such as misinterpretations and misjudgments. With panoramic clarity he expresses his concern for the ensuing detrimental research cycle: an initial "precipitate explanation" gradually evolves into a tentative theory; becomes an adopted theory and finally reaches the dubious status of the ruling theory. Evoking analogies not often found in contemporary academic literature, he points out that research -like love- can suffer from the tendency to blindness. Chamberlin then turns his sharp

critical gaze to “the” scientific method of his day: the working hypothesis. He concludes that while it is an improvement, its basic flaw is that it is “but the means for the more ready development of facts and of their relations” and can quickly become the usurper to the title of the ruling theory. Chamberlin proposes that, faced with the complexities of research, the “method of multiple working hypotheses” provides an antidote to presumptions “that this or that has been done because it accords with our ruling hypothesis or our working hypothesis”. In an ardent conclusion he states his belief that the “greatest moral reform” consists in the universal adoption “in social and civil life” of his favored approach. The hypothesis of the innovation-based view of the fits within Chamberlain’s typology as “while much is known” about the topic of innovation, much more work is required. Furthermore, IBV demonstrates “independent thinking” and together with RBV and KBV provides researchers with a toolkit of “multiple working hypotheses” to address the complexities of business research.

In the previous sections, this article argues that based on the recent developments in the relevant literatures, a paradigmatic shift from resources and knowledge to innovation as the primary driver of competitive advantage for the firm is now evident. Next, the article presents empirical evidence to support this claim.

CASE DESCRIPTION

The analysis of the literature in the previous section resulted in the conclusion that the theory of the firm must now be cognizant of the primacy of innovation. Lewin is famous for his assertion that “there is nothing as practical as a good theory”. However we will take the aphorism of his student Bronfenbrenner (2005) who reversed the classical Lewinian maxim to read: “There is nothing like the practical to build a good theory” (p 48). Consequently we will outline the case study from which the theory emerged as we grappled with the topic of innovation in a multinational company and reflected on the role of resources and knowledge

in the organization. Results from the empirical case study will now be presented to support our claim of the increasing primacy of innovation as the agent of advantage. This study is based in APC Ireland, formerly a subsidiary of the American Power Conversion (APC) Corporation. APC entered a major period of transition in the first quarter of 2007 with completion of its acquisition by Schneider Electric and the formation of a new subsidiary called APC (by Schneider Electric). As the main part of this study was developed before the acquisition, this section will focus on providing a background to the APC context in which the work was carried out. APC designs, manufactures and markets back-up products and services that protect hardware and data from power disturbances. The explosive growth of the Internet has resulted in the company broadening its product offerings from uninterruptible power supplies (UPS) to the high-end InfraStruXure™ architecture in order to meet the critical availability requirements of internet service providers (ISP) and data-centers. This modular design integrates power, cooling, rack, management and services, which allows customers to select standardized modular components using a web-based configuration tool. The Corporation reported sales of \$2 billion in 2005, globally employs approximately seven thousand people and is a Fortune 1000 company. APC aims to set itself apart from the competition in three areas: financial strength, innovative product offerings and efficient manufacturing (APC, 2006) However, recent financial reports have stressed that the company needs to implement significant improvements in manufacturing and the supply chain (Results APCC 2005, 2006). According to these published reports, the company must work to develop a “lean, customer-centric, ambidextrous organization” in order to reach “optimal efficiencies in our processes”. APC had two locations in the West of Ireland that serve EMEA region. The Manufacturing Operations site, based in Castlebar, employed approximately 100 people; and a number of functions including sales, information technology, business support and R&D are situated in Galway with workforce of approximately 300. The widening of a focus from the

manufacturing of discrete products, such as UPS, to the delivery of customized InfraStruXure™ solutions provides both challenges and opportunities for the Operations function. Responding to the supply chain challenge, a Lean Transformation Project was set up in the Castlebar campus in February 2006 with a cross-functional team of twelve members drawn from Management, Engineering, Manufacturing, Materials Planning, Quality and Logistics functions. The Lean Project team set an objective to quickly deliver the message that Ireland is responding to, and leading, the corporate initiative and to provide a platform for the Irish subsidiary to obtain a reputation as an innovative location. An initial corporate feedback is that this project is “ahead of the curve” in terms of the other regions. A major requirement from corporate executives was that any innovations resulting from the initiative could be replicated in other regions.

APC Ireland is keen to take the leadership role in enhancing its global competitiveness by becoming a knowledge leader in the area of supply chain expertise. The manufacturing practices and processes used within the corporation have come under increased pressure from global competition. In addition, building up a lean enterprise is treated as a corporate-wide task. Now we will outline the research approach undertaken in the study.

RESEARCH METHOD

The research approach utilized in the longitudinal study of innovation management in the Irish subsidiary is now presented.

Research Approach

The conclusions by Benbasat & Zmud (1999) concerning the lack of relevance in management research were, to put it mildly, a criticism of the discipline. Consequently the initial approach to the case study was closely related to the following recommendation in their paper:

Researchers should look to practice to identify research topics and look to the literature only after a commitment has been made to a specific topic.

However, the linear nature of their recommendation does not sufficiently accommodate the dynamics of a real-world corporate environment so this study adopted a more iterative approach, going from practice to literature in a continuous cycle. The study is presented from the perspectives of a researcher undertaking a longitudinal study of innovation management in the Irish subsidiary with the back-up of colleagues in the research area. Slappendel (1996) recommends using a research team approach to overcome limitations when examining innovation in organizations from the interactive process perspective. Furthermore the researcher had the status of a temporary employee with his own email address and intranet access. The innovation project consisted of two main phases outlined below: an ethnographic study during 2006 followed by dialogical Action Research in 2007.

Phase 1: Ethnographic study – January to December 2006

Data collection methods during this phase involved: maintaining a log book, reviewing documents and information systems, records, interviews, observations (direct and participant), artifacts and surveys in order to develop a database and body of evidence (Gillham, 2000; Yin, 1994). A total of 29 unstructured or open interviews were undertaken that involved approximately 60 hours of interview time and 24 days spent in the company sites. The interviews were conducted across a wide area of the organization that included: Senior Managers with global, EMEA and site responsibilities, Middle-Managers, Team Leaders, Engineers and a number of people in general planning roles.

Phase 2: Dialogical Action Research - January 2007 to April 2007

Action Research (AR) originated from the work of Kurt Lewin during the 1940s and has been summarized as an approach that “combines theory and practice (and researchers and practitioners) through change and reflection in an immediate problematic situation within a mutually acceptable ethical framework” (Avison, Lau, Myers, & Nielsen, 1999). Its

application has not been without controversy particularly in debates with positivist science on the justification and generation of knowledge. These arguments were addressed by Susman and Evered (1978) in their influential description of AR as consisting of a cyclical process involving five phases. The focus of AR has been to address real-life problems through intervention together with the research objective of making a contribution to knowledge. Avison *et al.* (1999) argue that it took until 1998 for the community to agree that qualitative approaches, such as action research (AR), were finally gaining acceptance and propose that “to make academic research relevant, researchers should try out their theories with practitioners in real situations and real organizations”. One persistent bone of contention has been the “paucity of methodological guidance” for conducting and evaluating AR studies which resulted in a number of principles being proposed by Davison, Martinsons, & Kock, (2004). Coghlan & Brannick (2005) emphasize the importance of the social and academic context in which action research is carried out; a criterion that was addressed by describing the business environment of the case study in a previous section. Recently, Mårtensson & Lee (2004) suggested a new form of action research called dialogical AR. Here is a brief description of their approach.

In dialogical action research, the scientific researcher does not "speak science" or otherwise attempt to teach scientific theory to the real-world practitioner, but instead attempts to speak the language of the practitioner and accepts him as the expert on his organization and its problems.

The main contact point during Phase 1 was the Senior Engineering Manager who became Plant Manager of the Castlebar location during 2006. This interaction involved approximately eleven direct meetings with an estimated seventeen hours of interactions.

Data Collection

There was an agreement in January 2007 to move forward using dialogical Action Research with meetings every two weeks. In their paper Mårtensson & Lee propose that “reflective dialogues outside the organization can help the manager to reflect on, learn from, and remedy managerial problems in the organization”. In particular, the discipline of having to take regular timeout in a time-pressured manufacturing environment was a major incentive for the Plant Manager to agree to this approach. The Plant Manager also considered the framework advantageous since it allowed him to retain control and responsibility for all decisions, implementations and communications. However there are a number of practical risks with this type of longitudinal research in a dynamically changing corporate environment, such as the realities of reorganizations and relocations that are not pointed by Mårtensson & Lee.

In addition to the above there were 11 meetings with the main point of contact for the project which totalled seventeen hours in duration. These meetings became the basis for the dialogical AR approach during the second phase of the project. Data collection during the dialogical AR period involved recording of the meetings which were subsequently transcribed verbatim by the researcher. Given the rich nature of the data, this was considered the optimum way of capturing the reflective meaning and ensuring consistent interpretation. Analysis was done manually through the examination of each meeting transcript and providing a summary of the topics discussed in the transcripts. This then was sent to the plant manager for evaluation and agreement that it was an accurate portrayal of the meeting. In total these transcripts ran to over 60,000 words. A profile of the interviews is set out in the table below.

The data gathered from the interviews were by their nature subjective and hence open to interview bias. However, the broad range of interviewees was an attempt to get various perspectives across the organisation. As pointed out by Howcroft (1998) in a similar situation,

this was not a positivistic study that wished to claim scientific objectivity but that “any values that are invoked are those that inform the theoretical perspective” (p 123).

Table 2 about here

Data Analysis

Qualitative data focuses on words rather than the numbers of quantitative data and there has been a major expansion of qualitative enquiry over the last twenty years (Miles & Huberman, 1994). Furthermore it is having an increased influence on the management discipline (Kaplan & Duchon, 1988; Lee, 2001; Myers, 1997a; Myers, 1997b; Trauth, 2001). A number of different methods can be adopted to analyse interviews such as “content, narrative and semiotic strategies” (Denzin & Lincoln, 2008) while Myers and Newman (2007) caution that the interview has remained a relatively “unexamined craft” (p 2).

As Gummesson (2000) points out deductive research “primarily tests existing theory” while inductive research “primarily generates new theory” (p 64). The latter was the main aim of this research study. Glaser and Strauss development of grounded theory was part of a significant growth in qualitative analysis during the 1960s and 1970s. Indeed Locke (2000) concurs that grounded theory was one of a number of methods that “attempted to bring more formalization and systematization to qualitative methods” (p 12). In grounded theory the theory emerges during the research study and is “the product of continuous interaction between analysis and data collection” (Goulding, 2002). This is part of a tradition that goes

back to Aristotle “who made frequent reference to concrete example to illustrate his theoretical points” (Kenny, 2010). Charmaz (2004) describes the fundamental premise of grounded theory as letting the “key issues emerge rather than to force them into pre-conceived categories” (p 516). Also the approach in grounded theory is to let the “codes emerge as you study your data” (p 506). Robson (2002) (p 59) describes qualitative analysis as being much closer to “codified common sense” than to the “complexities of statistical analysis” associated with quantitative data and provides the following typology from the work of Crabtree and Miller (1992):

- (a) quasi-statistical methods
- (b) template approaches
- (c) editing approaches; and
- (d) immersion approaches.

This follows a progression from a more structured approach to a less formal approach. In fact there is a debate whether the immersion approach can be classified as a scientific method *per se*. The editing approach which is closest to the method employed in this study is characterised by being interpretive and flexible with no or few *a priori* codes. In this method “codes are based on the researcher’s interpretation of the meanings or patterns in the texts” (p 458) and it is typified in grounded theory approaches.

The analysis techniques adopted in this research consisted in a number of mechanisms that dovetail with the following methods described by Miles and Huberman (1994 p 51):

- contact summary sheet
- memoing ; and
- interim case summary

However the basic approach of phenomenology, as these authors point out (p 8), involves working with the entire interview transcripts, where coding is not normally used, in order to reach the “*Lebenswelt*” or life-world of the interviewee.

A *contact summary sheet* is “a single sheet focusing or summarising questions about a particular field contact” in order to develop a synopsis “of the main points in the contact” (p 51). In this study it involved the transcription of the interview with the practitioner and then summarising the main themes by placing them in the following “bins”: *purpose of the meeting, summary of the main points of the meeting, actions arising out of the meeting and finally the agreed agenda for the next meeting*. The direct tape recordings of the field events were transcribed into text and then the process involved making “notes, selecting excerpts and making judgements” (p. 51). The contact summary sheet was placed as the cover sheet of each transcribed interview so the information was available for review. In the case study report, the excerpts from the dialogical research were presented in terms of the topics that emerged from the analysis.

Memoing is a method that took a classic form in the work of Glaser (1978) and involves attempting to stand back and to “make deeper and more conceptually coherent sense of what is happening”. They are “primarily conceptual in intent” and strive to “tie together different pieces of data into a recognisable cluster” (Miles and Huberman 1994 p. 72). In this study the researcher used “memoing” to gather together some of the concepts that were emerging from the interviews. These conceptual memos were of the more “elaborate variety” (p. 74) and formed the basis for writing the data into academic papers that involved crystallising of ideas emanating from the research.

An *Interim Case Summary* “provides a synthesis of what the researcher knows about the case” and “also indicates what needs to be found out”. It involves pulling together what is known about the case (p 79). This was done at various stages of the study – during and after the pilot

study, during the various phases of the action research cycles- and together with the memoing discussed above became the basis for academic papers reporting the research.

FINDINGS

The paper will now proceeds to provide an analysis of the empirical data gathered in the innovation using the theoretical frameworks outlined in the literature review.

Using four broad categories, the “4Ps” of innovation proposed by Tidd et al. (2005), the corporate division can be regarded as being an innovative company in the area of product innovation (for example the success of InfraStruXure™) and of position innovation (the relatively new markets of data centers and server farms). But there is a need for improvements in process innovation (delivery of products and services) and paradigm innovation (organizational models). This provides both challenges and opportunities for the Ireland Operations function, especially in the context of the acquisition by Schneider Electric. The setting-up of the local Lean Transformation Project and the embracing of Lean methodologies and techniques to support the corporate strategy were seen to be globally “ahead of the curve”. However, the location must be cognizant of the current movements in Lean thinking from a focus on production to the area of solutions and the process of consumption. Also, the review of the supply chain management literature suggests that Lean is one among a number of strategies and is particularly suitable for the customer segment that is focused on efficiency and consistency. Prior to the acquisition, APC’s large systems have shown impressive growth of 30% year over year driven by the demand for network-critical ICT infrastructures. However these complex installations suggest the need for different supply chain strategies, particularly due to the impact on the gross margin of the SG&A expenses to support this growth with the resulting adverse affect on profitability. The merger business case proposes to

deploy best practices in large systems and services and to “streamline and rebalance [the] supply chain” while capitalizing on small systems success.

The strategy of creating an innovative culture in the supply chain has a sound basis for two reasons: developing a sustainable and competitive advantage for the Irish location and contributing to the focus on innovation that was emphasized by both APC and Schneider in the merger value proposition. However, a review of the copious literature on innovation results in the conclusion that there is no silver-bullet or neat positivistic formula to achieve this aim. Putting in place a culture or climate that allows innovation to flourish is a major test of the art of management and involves the “tuning” of many logics with opposing frequencies and unpredictable oscillations. However, therein lies an opportunity especially now that many organizations, in the wake of project failures, are revisiting the previous conventional wisdom that offshoring to the lowest cost location is automatically the best business decision (Ciborra, 2000a p 33). Porter contends that innovation is the ingredient that allows a firm to lower cost while at the same time enhancing differentiation and thus realize two competitive strategies that can be in conflict (Porter, 1998 p 20). A number of other findings included the following:

- Dialogical action research provides a new approach to the study of innovation. It is especially suitable when the practitioner seeks to retain control of the implementation of the project. However dialogical AR is relatively untested and this study is intended to contribute to debate on the approach.
- The dialogical AR provided an interpretive space for the practitioner. The importance of this factor for innovation has been emphasised by Lester and Piore (2004) to compliment the analysis dimension of innovation.

- There has been few longitudinal case studies carried out that have been embedded in a single MNC subsidiary located in Ireland . The study addresses this gap and provides groundwork for further explorations in the area.
- One characteristic stressed by Mårtensson and Lee is that the researcher must be interested in and have the ability to “facilitate the reflective dialogues” (2004 p 533). In this research study, the experience of the researcher of an MNC operations environment was of particular benefit. Furthermore the year spent doing a case study before undertaking the dialogical AR was crucial to understanding the nuances of the context and situation.
- In this project the practitioner found it very beneficial that the researcher had summarised academic literature that he thought would be of value to the situation under review. This would be in-line with a dyadic view; that is when one member of a dyad develops then the other develops as well.
- One of the feedback items was that the project and interactions provided an intellectual stimulation for the practitioner that would not normally be associated with the world of praxis.

DISCUSSION

Innovation is now a major focus for organizations, regions and economies and the subject is increasingly seen as being crucial not only to success but to survival. According to Brynjolfsson & Saunders (2009) the fundamentals of the world economy indicate that there will be a continuation of innovation in technology “through the booms and busts of the financial markets and of business investments” (p ix). However, Wolfe’s (1994) concludes that the abundant growth in innovation literature has made little contribution to the understanding of innovative behaviors in organizations. His evaluation that the results were

“inconclusive, inconsistent and characterized by low levels of explanation” raises serious issues for researchers venturing into the field. One of his recommendations, particularly relevant to this study, is to pay more attention to the “personal, organizational, technological and environmental contexts” of the innovation phenomenon being studied. More recently, Ward and Peppard (2002) suggest that researchers have “much to learn about how knowledge can be effectively managed before we can understand how best to deploy IT to improve the processes involved”. Building on this recommendation, “innovation management” is an even more topical theme on the corporate agenda and the research community must strive to better understand the topic. Many questions increasingly exercise the minds of managers, entrepreneurs, policy makers and academics as they grapple with this perennially important topic. These include reasons why an innovation is successful in one organization and met with resistance in another and how it is that certain innovations diffuse easily through an environment while others do not. After almost half a century of intense research and theorizing, the academic contribution to answering questions such as these is less than convincing (Fagerberg, 2005).

We will now discuss some implications from our review of the literature and the case study presented earlier. Viewing innovation within its dynamic environment through the lens of oscillating paradoxes and opposing logics could provide fruitful insights for both practitioners and researchers. This proposal is of particular relevance for the study of innovation in such an efficiency-driven milieu as a supply chain. For example, Pettigrew & Fenton (2000) examine innovative forms of organizing through the lens of complexities and dualities. Leavy (2005), based on his study of corporations such as GE and ABB, contends that the balance between innovation and efficiency is a dynamic challenge with most companies tending to oscillate between the two with the danger of overshooting after the initial release of talent and energy . The local case study provides empirical data of the multi-

dimensional importance of innovation in a Corporation using the four categories proposed by Tidd *et al.* The examination of the innovation case study suggested that resources and knowledge do not provide any significant differentiation and that the primary causation of advantage is innovation.

Consequently, the resource-based and knowledge-based views of the firm need to progress to an innovation-based view (IBV): a perspective that is more in tune with recent developments in the literature and the realities of practice. The argument is summarized in the following proposition:

An innovation-based theory of the firm considers the ability to manage innovation as the most strategically significant resource of the firm. The capability to manage the complexities, paradoxes and opposing logics of innovation is an antecedent in achieving sustainable competitive advantage for a firm and its subsidiaries.

Now following the VRIN of Barney (1991)-value, rare, inimitable and non-substitutable- we would like to postulate our own acronym that proposes five empirical indicators of the potential of innovation to generate sustained competitive advantage. An innovation-based view of the firm makes a POINT.

P: involves managing *paradoxes* and opposing logics

O: entails a degree of *openness*

I: requires balancing the dilemma of *initiation* and *implementation*

N: can be *non-technological* in nature

T: can be *technological* in nature

We will now discuss the acronym in more detail.

Paradoxes. Innovation will only be successful in a firm and be a source of competitive advantage if it has the capability to manage inherent paradoxes and opposing logics. An initial taxonomy of such paradoxes is outlined in table 1. This is not an exhaustive list but a first cut

attempt to identify such occurrences. Further research is required to test and extend this compilation.

Openness. We argue that in the present milieu that a firm is operating in precludes it from being a completely closed system. “Open” and “closed” innovation is not a digital relationship but an analogue continuum that stretches from a low degree of openness to a high degree. The term openness has been recently explored by Almirall & Casadesus-Masanell (2010) and we believe that the topic is fertile for further research. A firm will enjoy a competitive advantage when it is able to gauge the level of openness required to bring a product or service to market.

Initiation and Implementation: While managing paradoxes and openness is can be sources of competitive advantage, resolving the dilemma of initiation and implementation is fundamental to the innovation process. This dilemma originated in research carried out over fifty years ago and has largely disappeared from the innovation literature. Our aim is to reinstate the work of Wilson and Zaltman as core to the innovation debate.

Non-Technological. While the other criteria broadly refer to the management of innovation for sustainable competitive advantage, here we propose that a firm must innovate in non-technological areas to maintain sustained competitive advantage. For example a firm must innovate in areas such as organisation and marketing so as to obtain maximum return from managing paradoxes, openness and the innovation dilemma. Configuring the non-technological aspects is necessary to stay ahead of the curve.

Technological. The most tangible area for innovation is the development and introduction of products and services. However we argue that there is a need to broaden that discussion to take into account changes in the firm's marketing strategy. There has been a significant move to delivering solutions in recent years where customers have migrated from ordering products and services to ordering solutions. This has involved major firms (especially in the ICT industry) positioning themselves as solutions providers where the customer describes the offering they require while the company looks after the technicalities. Pricing is then done by functionality rather than hardware and software content. Another technological area that is affecting the milieu of the firm is servitisation (Dimache & Roche, 2011). Servitisation essentially describes the move on the Product-Service System (PSS) continuum from product-plus-service (e.g. product plus extended warranty) to complete service delivered through the product, the product being the enabler of services (e.g. delivery of cubic meters of cold air and not a refrigeration unit). In the current global economy, manufacturers are under pressure to continuously adapt to the ever changing business environment (e.g. globalisation, environmental legislation, change in customer behaviour, trends towards purchasing services as distinct from products). Manufacturers can no longer rely on the traditional product-focused business models; they need to be highly adaptive and innovative in order to compete. It is not appropriate for all companies to move to servitisation, but for those that it is, a rapid move to servitisation is likely to provide an enhanced foothold in the marketplace.

Implications and Limitations of the Study

Neavel-Dickens (1998) states that "it will be important to include more practitioner voices in studies of action research" (p 257). It is argued that the utilisation of dialogical AR can provide a rich and detailed format to present the voice of one practitioner and it is especially suitable for capturing the interactions during a live project. This could be viewed as the project long perspective of an "elite" practitioner using the term in the same sense as an

“elite” interview. It is also argued that the method can facilitate the generation of theory as presented in this study. However, the work is open to the much debated limitations of the case-study approach such as the topic of generalization (Mintzberg, 1979). A corporate subsidiary in Ireland was taken as the unit of analysis for the study and empirical data are confined to these.

CONCLUSIONS

KBV and RBV are two influential theories of the firm used in business and management research. This study examined these views using two approaches: by reviewing recent developments in the literature and by presenting an empirical study of corporate innovation in a subsidiary located in Ireland. The review indicated that a growing body of literature points to innovation as the principal source of competitive advantage. In addition, the emerging models of “open innovation” posit that knowledge and resources increasingly reside outside the firm’s locus of control. Using a grounded theory approach, the longitudinal case study provided empirical evidence of the growing focus on innovation over resources and knowledge. Consequently, an innovation-based view (IBV) of the firm was proposed as a novel contribution to theory. Also, by evoking the influential paper of Thomas Chamberlin, the hypothesis was securely placed in the academic debate on the development of theory. Future work is required to further develop the concepts and constructs associated with an IBV and to empirically test the proposition. In his seminal paper Wernerfelt (1984) commented that his paper was meant “only as a first cut at a huge can of worms” (p 180). We hope that our paper can stimulate some debate on the nature of theory of the firm and competitive advantage at the beginning of the present millennium.

REFERENCES

- Adams, R., Bessant, J., & Phelps, R. 2006. Innovation management measurement: A review. *International Journal of Management Reviews*, 8(1): 21-47.
- Allen, T. J. 2004. Communication Networks in R&D laboratories. In R. Katz (Ed.), *The Human Side of Managing Technological Innovation: A Collection of Readings*, Second ed. Oxford: Oxford University Press.
- Almirall, E., & Casadesus-Masanell, R. 2010. Open Versus Closed Innovation: A Model of Discovery and Divergence. *Academy of Management Review*, 35(1): 27-47.
- Amabile, T. M., Hadley, C. N., & Kramer, S. J. 2003. Creativity Under the Gun *Harvard Business Review on The Innovative Enterprise*: Harvard Business School Press.
- APC. 2006. American Power Conversion Corporation (available on-line through <http://www.apcc.com/>) accessed March 2011.
- Avison, D. E., Lau, F., Myers, M. D., & Nielsen, P. A. 1999. Action research. *Communications of the ACM*, 42(1).
- Barney, J. B. 1991. Firm resources and sustained competitive advantage. *Journal of Management Information Systems*, 17: 99-120.
- Benbasat, I., & Zmud, R. W. 1999. Empirical Research in Information Systems: The Practice of Relevance *MIS Quarterly*, 23(1): 3-16.
- Bronfenbrenner, U. 2005. Lewinian Space and Ecological Substance. In U. Bronfenbrenner (Ed.), *Making Human Beings Human: Bioecological Perspectives on Human Development* 41-49: Sage Publications.
- Browne, J., Cormican, K., Dooley, L., Yu, M., & O'Sullivan, D. 2000. *Innovation Management for Product and Process Development*. Paper presented at the Proceedings of the International Conference of Information Technology in Business, August 2000, Beijing, China.

- Brynjolfsson, E., & Saunders, A. 2009. *Wired for Innovation : How Information Technology Is Reshaping the Economy*: MIT Press.
- Carlsson, S. A. 2003. Strategic knowledge managing within the context of networks. In C. W. Holsapple (Ed.), *Handbook on Knowledge Management*, Vol. 1: 623-643. New York: Springer.
- Chamberlin, T. C. 1890. The Method of Multiple Working Hypotheses. *Science*, 15(92).
- Charmaz, K. 2004. Grounded Theory. In S. N. Hesse-Biber, & P. Leavy (Eds.), *Approaches to qualitative research : a reader on theory and practice*. New York ; Oxford: Oxford University.
- Chesbrough, H. W. 2003. *Open innovation: the new imperative for creating and profiting from technology* Boston: Harvard Business School.
- Christensen, C. M., Yang, W., Verlinden, M. C., & King, S. M. 2005. Chip industry must learn not to overshoot (*available on line through <http://www.eetimes.com> accessed November 2006*): EE Times
- Ciborra, C. 2000. From Control to Drift : The Dynamics of Corporate Information Infrastructures.
- Ciborra, C. 2002. *The Labyrinths of Information: Challenging the Wisdom of Systems*. Oxford: Oxford University Press.
- Coakes, E. (2000). Knowledge management: A sociotechnical perspective. In E. Coakes, D. Willis, & S. Clarke (Eds.), *Knowledge Management in the Sociotechnical World: The Graffiti Continues*: 4-14. London: Springer.
- Cooper, R. G., & Kleinschmidt, E. J. 1993. Stage Gate Systems for New Product Success. *Marketing Management*, 1(4): 20-29.

- Costello, G. J., & Donnellan, B. 2007. The Diffusion of WOZ: Expanding the Topology of IS Innovations *Journal of Information Technology*, 22: 79-86
(doi:10.1057/palgrave.jit.2000085).
- Crabtree, B. F., & Miller, W. L. 1992. Primary Care Research: a multi-method typology and qualitative road map. In B. F. Crabtree, & W. L. Miller (Eds.), *Doing Qualitative Research* Thousand Oaks, Calif.: Sage.
- Curley, M. 2004. *Managing Information Technology for Business Value*: Intel Press.
- Curley, M. 2006. *A Value Based IT Capability Maturity Framework*. Paper presented at the Intel EMEA Academic Forum, Ireland. (2006).
- Curley, M. 2007. *Introducing an IT Capability Maturity Framework*. Paper presented at the keynote address at the International Conference for Enterprise Information Systems, ICEIS, Madeira, Portugal, 12-14 June 2007.
- Davison, R. M., Martinsons, M. G., & Kock, N. 2004. Principles of canonical action research. *Information Systems Journal*, 14(1): 43-63.
- Denzin, N. K., & Lincoln, Y. S. 2008. *The Landscape of Qualitative Research*: Thousand Oaks, Calif. : Sage Publications.
- Dimache, A., & Roche, T. 2011. A Decision Methodology to Support Servitisation of Manufacturing. (*forthcoming*) *accepted for publication in the Special Issue on Trends in Modern Operations Management, the International Journal of Operations & Production Management*.
- Drucker, P. 1988. *The coming of the new organization*. Cambridge MA: Harvard Business School Press.
- Fagerberg, J. 2005. Innovation: A Guide to the Literature. In J. Fagerberg, D. Mowery, & R. Nelson (Eds.), *The Oxford Handbook of Innovation*: 1-26. Oxford: Oxford University Press.

- Fagerberg, J., Mowery, D., & Nelson, R. R. (Eds.). 2005. *The Oxford handbook of innovation / edited by* Oxford: Oxford University Press.
- Gillham, B. 2000. *Case study research methods* London: Continuum.
- Glaser, B. G. 1978. *Theoretical sensitivity: Advances in the methodology of grounded theory*. Mill Valley, CA: Sociology Press.
- Goffin, K., & Mitchell, R. 2005. *Innovation Management: Strategy and Implementation using the Pentathlon Framework*. Houndmills, Basingstoke: Palgrave Macmillan.
- Goulding, C. 2002. *Grounded theory a practical guide for management, business and market researchers* London:Thousand Oaks, Calif.: SAGE.
- Grant, R. M. 1996. Toward a knowledge-based theory of the firm *Strategic Management Journal*, 17: 109-122.
- Gummesson, E. 2000. *Qualitative methods in management research, Second Edition*. London Thousand Oaks, Calif. Sage.
- Hevner, A. R., March, S. T., Park, J., & Ram, S. 2004. Design Science in Information Systems Research. *MIS Quarterly*, 28(1): 75-105.
- IVI. 2011. Innovation Value Institute www.ivi.ie accessed April 2011.
- Kaplan, B., & Duchon, D. 1988. Combining Qualitative and Quantitative Methods in Information Systems Research : A Case Study. *MIS Quarterly* 12: 571-586
- Katz, R. 2004. Introduction. In R. Katz (Ed.), *The Human Side of Managing Technological Innovation: A Collection of Readings*, Second ed. Oxford: Oxford University Press.
- Kelley, T. 2001. *The Art of Innovation: Lessons in creativity from IDEO, America's leading design firm* New York Doubleday.
- Kenny, A. 2010. *A New History of Western Philosophy*: Oxford University Press.
- Laudon, K. C., & Laudon, J. P. 2002. *Management Information Systems: Managing the Digital Firm* (Second ed.). New Jersey: Prentice Hall.

- Lazonick, W. 2005. The Innovative Firm In J. Fagerberg, D. Mowery, & R. R. Nelson (Eds.), *The Oxford Handbook of Innovation*. Oxford: Oxford University Press.
- Leavy, B. 2005. A leader's guide to creating an innovation culture *Strategy & Leadership* 33(4): 38 - 45.
- Lee, A. 2001. Challenges to Qualitative Researchers in Information Systems. In E. M. Trauth (Ed.), *Qualitative Research in IS: Issues and Trends*: 240-. Hershey, PA: Idea Group Publishing
- Leonard, D. 1998. *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*: Harvard Business School Press.
- Lester, R. K., & Piore, M. J. 2004. *Innovation-The Missing Dimension* Harvard University Press.
- Levitt, T. 2003. Creativity Is Not Enough, *Harvard Business Review on The innovative Enterprise*: Harvard Business School Press.
- Locke, K. D. 2000. *Grounded theory in management research* London SAGE.
- Mårtensson, P., & Lee, A. S. 2004. Dialogical Action Research At Omega Corporation. *MIS Quarterly*, 28(3): 507-536.
- Martin, R. L. 2007. *The Opposable Mind: How Successful Leaders Win Through Integrative Thinking* Harvard Business School Press;.
- Mathiassen, L., & Nielsen Peter Axel. 2008. Engaged Scholarship in IS Research. *Scandinavian Journal of Information Systems*, 20(2).
- Miles, M. B., & Huberman, M. A. 1994. *Qualitative data analysis : an expanded sourcebook* London Thousand Oaks ;Sage.
- Milligan, P., & Hutchenson, D. 2006. Analysis of Outsourcing and the Impact on Business Resilience. In B. Donnellan, T. J. Larsen, L. Levine, & J. I. DeGross (Eds.), *International Federation for Information Processing (IFIP), Volume 206, The*

- Transfer and Diffusion of Information Technology for Organizational Resilience:*
209-216. Boston: Springer.
- Mintzberg, H. 1979. An Emerging Strategy of "Direct" Research *Administrative Science Quarterly*, 24(4): 582-589.
- Myers, M. D. 1997a. Qualitative Research in Information Systems *MIS Quarterly (MISQ Discovery, updated version, March 29, 2006,*
[http://www.auckland.ac.nz/msis/isworld/.](http://www.auckland.ac.nz/msis/isworld/)), 21(2): 241-242.
- Myers, M. D. 1997b. Qualitative Research in Information Systems. *MIS Quarterly (21:2), June 1997, pp. 241-242. MISQ Discovery, archival version, June 1997,*
[http://www.misq.org/discovery/MISOD_isworld/.](http://www.misq.org/discovery/MISOD_isworld/) *MISQ Discovery, updated version,*
last modified: www.qual.auckland.ac.nz.
- Myers, M. D., & Newman, M. 2007. The qualitative interview in IS research: Examining the craft. *Information and Organisation* 17: 2-26.
- Neavel Dickens, L. 1998. *A Theory of Action Perspective of Action Research. Ph.D. Dissertation, University of Texas at Austin.*
- Nonaka, I. 1994. A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1): 14-37.
- O'Brien, J. A., & Marakas, G. M. 2009. *Management information systems*. Boston McGraw-Hill Irwin.
- O'Reilly, C., & Tushman, M. L. 2004. The Ambidextrous Organization. *Harvard Business Review*, 84(3): 74-81.
- Pettigrew, A. M., & Fenton, E. M. 2000. Complexities and dualities in innovative forms of organizing. In A. M. Pettigrew, & E. M. Fenton (Eds.), *The innovating organization*. London: Thousand Oaks : Sage.
- Pfaffenberger, B. 2002. *Computers in your future* Upper Saddle River, N.J: Prentice Hall.

- Porter, M. 1998. *Competitive advantage: creating and sustaining superior performance*: The Free Press.
- Porter, M. 2003. Irish Competitiveness: Entering a New Economic Era, *IMI Top Management Briefing, Dublin, Ireland, 9 October 2003* (available on-line through www.isc.hbs.edu)
- Post, G. V., & Anderson, D. L. 2003. *Management information systems : solving business problems with information technology*. Boston ; London: McGraw-Hill/Irwin.
- Results APCC 2005. American Power Conversion Reports Record Revenue for the Fourth Quarter and Full Year 2005: (available on-line through <http://www.apcc.com/> accessed June 2006).
- Results APCC 2006. American Power Conversion Reports First Quarter 2006 Financial Results: (available on-line through <http://www.apcc.com/> accessed June 2006).
- Robson, C. 2002. *Real world research : a resource for social scientists and practitioner-researchers* [Oxford ; Madden]: Blackwell.
- Robson, W. 1997. *Strategic Management and Information Systems : An integrated approach* (Second ed.). London: Pitman Publishing.
- Rogers, E. M. 2003. *Diffusion of Innovations (fifth edition)*. New York: Free Press.
- Schumpeter, J. A. 1934. *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*. Cambridge, Mass. : Harvard University Press (1959 printing)
- Shavinina, L. V. (Ed.). 2003. *The International Handbook on Innovation*. Oxford: Elseiver.
- Slappendel, C. 1996. Perspectives on innovation in organizations. *Organization Studies*, 17(1): 107-129.
- Spender, J. C. 1996. Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17: 45-62.

- Susman, G. I., & Evered, R. D. 1978. An Assessment of the Scientific Merits of Action Research. *Administrative Science Quarterly*, 23(4): 582.
- Swanson, E. B., & Ramiller, N. C. 2004. Innovating Mindfully with Information Technology. *MIS Quarterly* 28(4): 553-583
- Swedberg, R. 1991. *Joseph A. Schumpeter: his life and work* Cambridge: Polity Press.
- Tidd, J., Bessant, J., & Pavitt, K. 2005. *Managing innovation: integrating technological, market and organizational change*. Chichester: John Wiley & Sons.
- Trauth, E. M. 2001. *Qualitative research in IS : issues and trends* Hershey: Idea Group.
- Treacy, M., & Wiersema, F. 1993. Customer Intimacy and other Value Disciplines. *Harvard Business Review*, January-February: 84-93.
- Tushman, M. L., & O'Reilly, C. 2004. The Ambidextrous Organization: Managing Evolutionary and Revolutionary Change. In M. L. Tushman, & P. Anderson (Eds.), *Managing Strategic Innovation and Change: A Collection of Readings* Second Edition ed. Oxford: Oxford University Press.
- Ulrich, K. T., & Eppinger, S. D. 2000. *Product Design and Development* (2nd Edition ed.): Irwin McGraw-Hill.
- Van de Ven A.H. 2007. *Engaged Scholarship: A Guide for Organizational and Social Research*: Oxford Univ. Press.
- Vanhaverbeke, W., & Cloudt, M. 2006. Open Innovation in Value Networks. In H. Chesbrough, W. Vanhaverbeke, & J. West (Eds.), *Open innovation: Researching a New Paradigm*: 258-284: Oxford University Press.
- von Hippel, E. 1998. *The sources of innovation* Oxford: Oxford University Press.
- von Hippel, E. 2005. *Democratizing Innovation*. Massachusetts: The MIT Press.
- Ward, J., Griffiths, P., & Whitmore, P. 1990. *Strategic Planning for Information Systems*: John Wiley & Sons.

- Ward, J., & Peppard, J. 2002. *Strategic Planning for Information Systems* (3rd Edition ed.). Chichester: Wiley.
- Wasko, M. M., & Faraj, S. 2005. Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly*, 29(1): 35-57.
- Wenger, E. 2004. Knowledge management as a doughnut: Shaping your knowledge strategy through communities of practice. *Ivey Business Journal*, (January/February 2004): 1-8.
- Wernerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal*, 5(2): 99-197.
- West, J., Vanhaverbeke, W., & Chesbrough, H. 2006. Open Innovation: A Research Agenda. In H. Chesbrough, W. Vanhaverbeke, & J. West (Eds.), *Open innovation: Researching a New Paradigm*: 258-284: Oxford University Press.
- Wilson, J. Q. 1966. Innovation in organizations: Notes toward a theory. In J. D. Thompson (Ed.), *Approaches to Organizational Design*: 193-218. Pittsburgh,PA University of Pittsburgh Press
- Wolfe, R. A. 1994. Organizational Innovation: Review, Critique and Suggested Research Directions. *Journal of Management Studies* 31(3): 405-431.
- Womack, J. P., & Jones, D. T. 2003. *Lean thinking: banish waste and create wealth in your corporation*. London: Free Press.
- Yin, R. K. 1994. *Case study research: design and methods* London Sage Publications.
- Zaltman, G., Duncan, R., & Holbek, J. 1973. *Innovations and Organizations*. New York: Wiley.

Table1: Innovation paradoxes and opposing logics

Innovation Paradox/Opposing Logic		Reference
Open Innovation	Closed innovation	(Chesbrough, 2003)vis-à-vis (Cooper & Kleinschmidt, 1993)
Manufacturing Lead	User Lead	(Ulrich & Eppinger, 2000) vis-à-vis (von Hippel, 1998)
Mindful	Mindless	(Swanson & Ramiller, 2004)
Learning Organisation	Gatekeepers	(Allen, 2004)
Long-term Strategy	Quick Wins	(Browne, Cormican, Dooley, Yu, & O'Sullivan, 2000)
Present Efficiency	Future Innovation	(Katz, 2004) (Leavy, 2005),
Bricolage	Planning, Methods and Models	(Ciborra, 2002)
Innovation	Imitation	(Porter, 1998)
Ambidextrous	Focused	(Tushman & O'Reilly, 2004) vis-à-vis (Treacy & Wiersema, 1993)
Lean Perfection and 5S	Winging-it	(Womack & Jones, 2003) vis-à-vis (Kelley, 2001)
Creativity	Conformity	(Levitt, 2003)
Individualist	Structuralist	(Slappendel, 1996)
Outsourcing	Business Resilience	(Milligan & Hutchenson, 2006)
Creativity	Time-Pressure	(Amabile, Hadley, & Kramer, 2003)
Innovator	Laggard	(Rogers, 2003)
Analytical	Interpretive	(Lester et al., 2004)
Control	Drift	(Ciborra, 2000)

Table 2:Data Collection Summary

Number of Formal Interviews	22
Estimated hours	34.5
Meetings with main point of contact (additional to above)	11
Estimated Hours	17
Dialogical Action Research Meetings	16
Estimated Hours	22.5
TOTAL INTERVIEW HOURS	74
TOTAL DAYS ON SITE	42
Additional detailed discussions	8
Estimated Hours	18.5

Fig 1: Chesbrough's Innovation Funnel

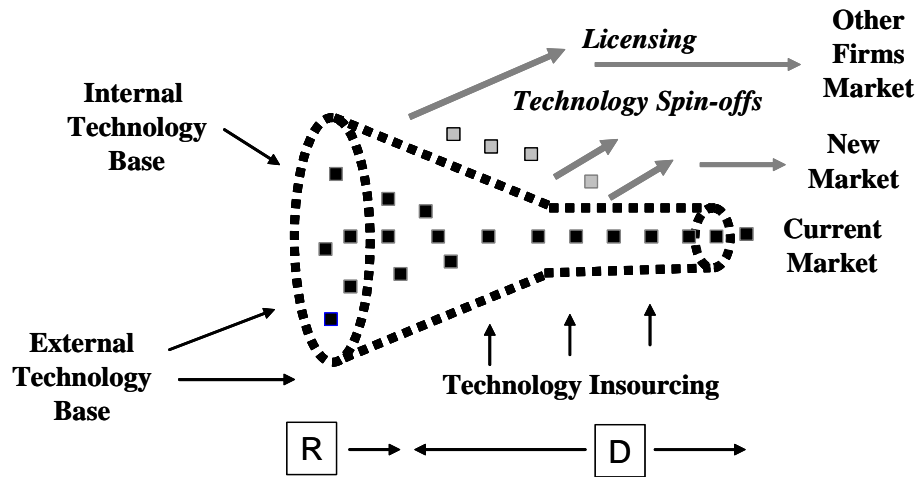


Figure 2
From a 3-era model to a 4-era model –developed from Ward *et al.* (1990)

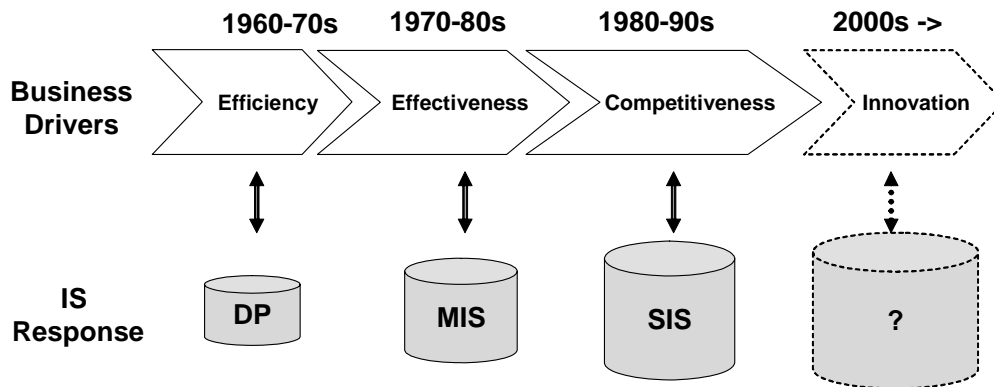


Fig 3: Conceptualisation of the Zaltman *et al* Innovation Dilemma