

# Chapter Two- Review of Literature

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## 2.1 Introduction

This chapter reviews the relevant literature to develop a theoretical framework for this research and to highlight the gap which will be later addressed by the research question. The chapter consists of six sections including this introduction.

Accordingly, Section 2.2 presents and discusses an overview of innovation. Issues such as organizational innovation and its importance for firms' (innovation) performance, definition and types of innovation will be discussed. In Section 2.3 relevant theories of innovation will be presented in detail. Section 2.4 highlights the gap and the research question in the context of Malaysia. The emergent theoretical framework is presented in Section 2.5, and its variables are operationalised. Section 2.6 presents the conclusion.

## 2.2 An Overview of Innovation

### 2.2.1 Organizational Innovation

It has been noted that academic interest in innovation has been perceptible since 1928 with Schumpeter's seminal work on *the instability of capitalism*, which highlighted innovation as the driving force of capitalism (Dharmadasa, 2009). Since then subsequent authors (Abernathy & Clarke, 1985; Damanpour, 1991; Hage, 1999; Tidd, Bessant & Pavitt, 2001; Cosh et al., 2005) have used the context of economic entities to explore the concept of innovation, and have supported the proposition that innovation has a direct impact on firm

performance. “Innovation is a means of changing an organization, whether as a response to changes in its internal or external environment or as a preemptive action taken to influence an environment (Damanpour, 1991, p.556).” Since the most stable environments also change (Hage, 1980), organizations are required to adopt innovations continually over time. Overall, as cited in Dharmadasa (2009), innovation provides organizations with a means of adapting to the changing environment (Greve, 2007; Thompson, 1965), and is often critical for firm longevity and success and survival. Several researchers (Brenner, 1987; Gomes-Casseres, 1994, 1996; Smith, Grimm, Gannon, 1992; Hage 1988) in the past also stated that innovations reflect a critical way in which organizations respond to either technological or market challenges. Particularly, as technological advancements are increasingly the basis of competition between nations (Kitson & Michie 1998; Porter, 1990), many businesses have come to realize the importance of innovation for survival in a world of global competition.

However, it should be noted that the field of innovation is broad, complex and subject to different interpretations within its different strands (Damanpour, 1991; Wolfe, 1994). The organizational design literature focuses predominantly on the link between structural forms and the propensity of an organization to innovate (Kimberly & Evanisko, 1981; Mintzberg, 1979). In this strand the unit of analysis is the organization, and the researcher’s main purpose is to identify and explore the structural characteristics which have impacts on organizational innovation (Dharmadasa, 2009). Moreover, in Craig and Moores’ study (as cited in Dharmadasa, 2009), authors underlined that capability in innovation management develops over time and must involve a process of continual learning. Therefore, researchers tend to view innovation as a dynamic process in which knowledge and skills are accumulated through learning and interaction that happens inside and outside

of the organization. This view of innovation, which is further elaborated in section 2.3 Theories of Innovation and its subsections: 2.3.1, 2, 3, forms the basis for this study which intends to discover the key drivers of innovative firms in Malaysia.

### **2.2.2 Definitions of Innovation**

The term innovation comes from the Latin *innovare*, which means “to make something new” (Tidd et al., 2001). This element of ‘newness’ can be found in various definitions of innovation one way or the other way round. As a case in point, Thompson (1965) defined innovation as the generation, acceptance, and implementation of new ideas, processes, products or services. Damanpour (1991) states that “the adoption of innovations is conceived to encompass the generation, development, and implementation of new ideas or behaviors (p. 556)”. Therefore, innovation, according to him, can be “a new product or service, a new production process, a new structure or administrative system, or a new program pertaining to organizational members (p. 556).” Rogers also (1998) defined innovation as the application of new ideas to the product, process or any other aspect of a firm’s activities. Drucker (2002) views innovation as a specific function of entrepreneurship with the help of which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth. As cited in Lawson and Samson (2001, p. 378) “innovation is the mechanism by which organizations produce the new products, processes and systems required for adapting to changing markets, technologies and modes of competition (D’Aveni, 1994; Utterback, 1994; Dougherty & Hardy, 1996).” Tidd et al. (2005) define innovation as “a process of turning opportunity into new ideas and of putting these into widely used practice (p.66).”

Furthermore, Dibrell, Davis and Craig (2008) underlined that innovations vary in complexity and can range from minor changes to existing products, processes, or services to breakthrough products, and to processes or services that introduce first-time features or exceptional performance.

On the whole, in view of the above definitions, it becomes clear that innovation can come in a variety of forms such as products, services, and processes, bearing the attribute of newness and/or improvement. However, attributes such as “new” or “improved” cast a certain degree of subjectivity on the notion of innovation; because what is considered new to one firm in a context is not necessarily considered new to another firm in a different context; therefore, it is possible that the innovation in two different firms and even different contexts is not identical. This observation emphasizes the degree of complexity associated with the term: innovation. (Dharmadasa, 2009)

In addition to theoretical definitions of innovation aforementioned, one can find attempts made by several international organizations to define the term. This is partly due to the fact that different institutions may interpret the concept of innovation differently and possibly due to their policy-making and administrative purposes (Dharmadasa, 2009). For example, the definition by Organization for Economic Co-operation and Development (OECD) is widely used in measuring and interpreting the innovative initiatives, particularly in the OECD member countries. The OECD (2005) defines innovation as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (as cited in OECD, 2008, p. 6)”. Table 2.1 presents the summary of innovation definitions.

Table 2.1: Summary of the Definitions of Innovation

Authors	Year	Definition
Thornhill	2006	Innovation is a process that begins with an idea, proceeds with the development of an invention, and results in the introduction of a new product, process or service to the marketplace.
OECD	2005	Innovation as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.
Erwin and Krakauer	2004	An innovation is an invention that becomes economically successful and earns profit where the invention is the creation and establishment of something new.
Gu and Tang	2004	Innovation means developing and using new technologies as well as new practices and forms of organization.
Jensen and Webster	2004	Innovation is referred to search for new and improved goods and services that will find a niche in the market. Product innovation or innovation refers to the creation of new (or improved) goods and services that are launched onto the market. Process innovation refers to changes in the way in which goods and services are produced. Organization innovation refers to changes in the architecture of production and accounts for innovation in management structure, corporate governance, financial systems or changes in the way workers are paid. Market innovation refers to improved way of sourcing supplies of raw inputs or intermediates goods and services as well as opening new market opportunities.
Lee	2004	Innovation is a new or significantly improved product (good or service) introduced to the market, or the introduction within the company of a new or significantly improved process. Innovation should be new to the company, but not necessarily new to the market.
Vermeulen et al.	2003	Innovative process normally applies to service and low-tech manufacturing firms and occurs not as the output of a formal, structured process. They are unplanned.
Drucker	2002	Innovation is a specific function of entrepreneurship with the help of which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth
Tidd et al.	2001, 2005	- To make something new - A process of turning opportunity into new ideas and of putting these into widely used practice
Richards	1999	Innovation is a process involving implementation novelty, associated with technology, and involving considerable levels of ambiguity and features specific to a given innovation.
Rogers	1998	Innovation as the application of new ideas to the product, process or any other aspect of a firm's activities.
D'Aveni; Dougherty & Hardy; Utterback,	1994, 1996, 1994	innovation is the mechanism by which organizations produce the new products, processes and systems required for adapting to changing markets, technologies and modes of competition
Damanpour	1991	Innovation can be a new product or service, a new production process, a new structure or administrative system, or a new program pertaining to organizational members.
Khan and Manopichet-wattans	1989	Two types of innovation from microeconomic perspective; entrepreneurial innovation and managed innovation. Entrepreneurial innovation occurs when new technologies and scientific developments yield economics opportunities that are seized by enterprising entrepreneurs, small dynamics fast-growing firms emerge and become the primary engine of innovation.

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Acs and Audretsch	1988	Innovation is a process that begins with an invention, proceeds with the development of the development of the invention, and results in the introduction of a new product, process or service to the market place.
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*Source:* Compiled by the author

The definition of innovation also constitutes two dimensions; namely, (i) New creation to the world, and (ii) New creation to the firm. New creation to the world is a narrower definition of innovation that only includes invention, where the only way to measure this level of innovation activity or flows of innovative services in a firm is to examine the number of new products and processes introduced over a given period of time. New creation to the firm is a much broader definition that includes initiatives and adaptation of existing products as well as inventions. The review of definitions, therefore, leads to the discussion of types of innovation based on both sides- academics, theorists, and practitioners/businesses. This is discussed in the next section.

### **2.2.3 Types of Innovation**

In the early literature in the field of entrepreneurship and innovation (as cited in Dharmadasa, 2009, p. 2-26), Schumpeter (1934) outlined five categories of innovation: (i) introduction of a new product or an improvement to an existing product, (ii) introduction of a new process or an improvement to an existing process, (iii) opening of a new market, (iv) development of new sources of supply for raw materials or other inputs, and (v) changes in industrial organization both inter-organizational and intra-organizational, such as the creation of a monopoly firm or a change in management structure.

Product innovation refers to the creation of new (or improved) goods and services that are launched on to the market. Van GeenHuizen and Indarti (2005) defined product

innovation as encompassing not only new product characteristics like the material or components used, but also new designs. The innovation process mainly relies on knowledge from in-house learning – by doing and experimentation, and on knowledge from buyers (customers). Vermeulen et al. (2005) viewed that new product development simply happens for any small firms. Here, innovative processes are mostly unplanned and not the output of a formal, structured process. However, firms may pursue innovations in their organization and manufacturing processes to become more productive and improve quality, reliability and efficiency (Wolff & Pett, 2006).

Process innovations refer to changes in the way in which goods and services are produced (i.e. new technology that improves the productivity of a production line or softer technological improvement such as the development of a new work culture), while organization innovation refers to changes in the architecture of production and accounts for innovation in management structure, corporate governance, financial systems or changes in the way workers are paid. The final type of innovation is market innovation which refers to improved ways of sourcing supplies of raw inputs or intermediate goods and services as well as opening new market opportunities (which could relate to either creating new domestic or export markets).

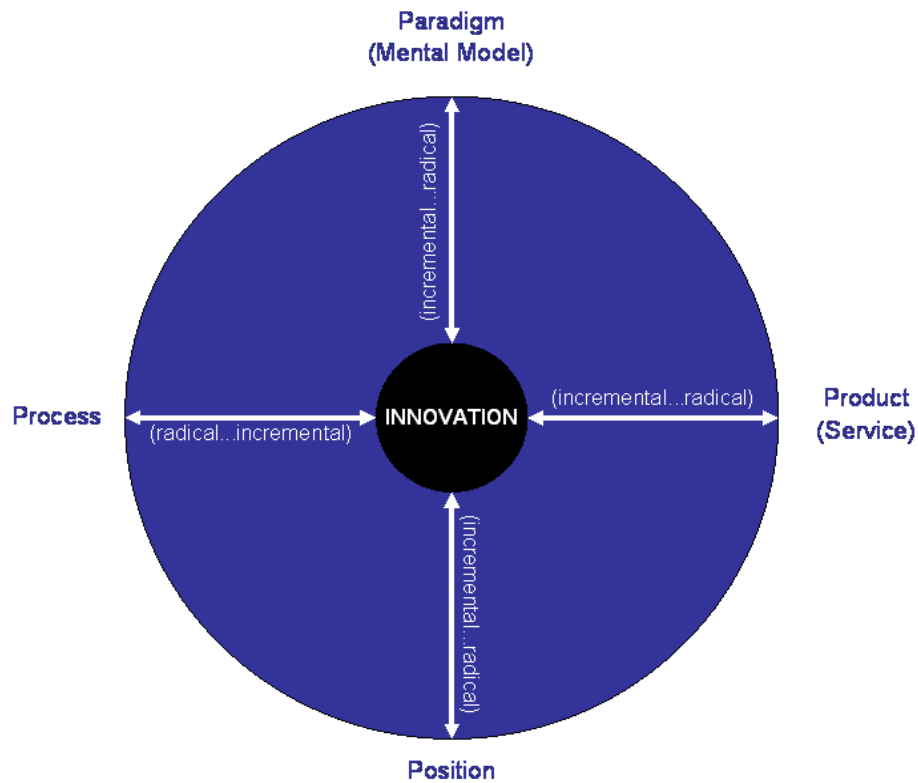
Schumann Jr. et al. (1994) also state another form of innovation which is *market driven innovation* in which the entrepreneur innovates in response to the direction indicated by the market. For this type of innovation, a strong market-driven organizational culture focused to produce the type of innovation required by the market is essential to success.

According to Tidd et al. (2005), organizational innovation can be described as changes which can take four different forms: product, process, position and paradigm innovation (p.10). Product and process innovation refer to changes in products or services offered by an organization and to changes in the creation or delivery of products or services, respectively. Position innovation, on the other hand, are “changes in the context in which the products/services are introduced”, for instance the re-launch of an old-established product in a new market segment without altering its features. Lastly, paradigm innovations occur upon “changes in the underlying mental methods which frame what the organization does (p.10).” Here, an example from airline industry clarifies the issue. This would be the shift from premium pricing to low-cost airline services.

Another important dimension to be differentiated here is the perceived *degree of novelty of an innovation*. This can exist in a continuum between minor, incremental changes to radical changes transforming its perception and usage (Tidd et al. 2005, p.12) and can be applied to all of the four previously mentioned types of innovation. Figure 2.1 graphically shows this innovation space in which companies have to operate.



Figure 2.1: The Innovation Space



Source: Tidd et al. (2005, p. 13)

According to Tidd et al. (2005), innovation management for incremental changes tends to be easier and less risky than for radical changes. This is due to the fact that the more radical the type of innovation the higher the uncertainty about the final innovation configuration and the path to achieve this configuration. Since an aim of innovation management is the reduction of this uncertainty into knowledge by the appropriate commitment of corporate resources, many more resources have to be committed to the management of radical changes than for incremental ones (Tidd et al. 2005, p.15). However, incremental changes are the most common form of innovation within an organization. For instance, only 6 to 10 per cent of all innovation projects are of a radical nature including

‘new to the world’ innovations (Ettlie, 1999). Therefore, the mastery of a successful innovation management for incremental innovation is just as important as the mastery of radical innovation. In this study, the focus is on incremental innovation from the product and process innovation perspective.

## **2.3 Theories of Innovation**

Innovation plays a pivotal role in the entrepreneurial process of wealth creation. It can also help firms play a dominant role in shaping the future of their industries. “High-performing innovators are able to maintain a giant juggling act of capabilities, and consistently bring new high quality products to the market faster, more frequently and at a lower cost than competitors (Lawson & Samson, 2001, p. 381).” In order to discuss innovation performance in more detail and analyze the contributing factors it is necessary to touch upon the underpinning theories within the framework of which such analysis is meaningful. Thus, in the subsequent sub-sections, attempts have been made to introduce and briefly discuss four main theories, views and concepts of innovation.

### **2.3.1 Organizational Capability**

There are various definitions of organizational capabilities cited in the management, strategy, and organization literature (Barney, 1991; Stalk, Evans & Shulman, 1992; Treacy & Wiersema, 1993; Amit & Schoemaker, 1993; Hayes & Pisano, 1994; Henderson & Cockburn, 1994). As a matter of fact, Collis (1994) states that there are almost as many definitions of organizational capabilities as there are authors on the subject. Moreover, Collis believes that it is difficult to make hard and fast distinctions among the categories of

capabilities identified in the literature as they all concern the ability of firms to perform an activity one way or the other (1994). Therefore, in this study I use the definition proposed by Collis which is formed after his critical review of the past research. In fact, he is one of the scholars who is widely cited for his seminal article entitled ‘How Valuable Are Organizational Capabilities?’ published in Strategic Management Journal in 1994. In this article, he defines *organizational capabilities* as “the socially complex routines that determine the efficiency with which firms physically transform inputs into outputs (1994, p. 145).”

This definition put forward by Collis (1994) comprises two important elements. The first is the notion that organizational capabilities are embedded in firm routines, and that those routines are a product of the organization as an entire system (Nelson & Winter, 1982; Barney, 1986, 1992a; Dosi, Teece, and Winter, 1990; Dosi and Marengo, 1992). This means that organizational capabilities are not “only manifestations of observable corporate structures and processes, but also reside in the corporate culture and network of employee relations (145).” These capabilities, (as cited in Collis, 1994), do not vest in a single individual, nor are they capable of being articulated by any individual since they are supraindividual and not reducible to individual memory (Teece, 1982, p. 44).

The second important element of the definition is that “it involves the transformation of physical inputs into outputs inside the 'black box' of the firm (Collis, 1994, p.145)”. Hence, “capabilities function as the organizational complement to the technological determinants of the efficiency (broadly construed) of production (p.145).” Consequently, better capabilities, acts like better technologies, in that they allow firms to more efficiently or effectively choose and implement the activities necessary to produce and deliver a

product or service to customers (Collis, 1994, p.146). This definition views organizational capabilities as a means of direct improvement to firm's efficiency, for example, by continuous improvement in operations capability, and as a means which enables firm to think of new ways to create value (Collis, 1994).

It is further argued that since "organizational capabilities represent resources accumulated over time and not acquired on tradable factor markets they are seen as meeting the condition of inimitability (Collis, 1994, p.146)." It is therefore, logical to accept that these capabilities can principally contribute to competitive advantage, and be invulnerable [to certain extent] to the threat of imitation or what today is termed as copycats, substitution, dissipation, and appropriation (Collis, 1995).

Notwithstanding the importance of organizational capabilities in regards to achieving sustainable competitive advantage Collis (1994) asserts that their value as the source of competitive advantage comes along with "more tangible resources and reputations", making them as "just another level in the explanation of sustainable competitive advantage with no greater claim to precedence than any other level (p. 151)." With this in mind, I need to shed light on resource-based view of the firm and dynamic capabilities in the following section.

### **2.3.2 An Overview of Resource-Based View and Dynamic Capabilities**

There are two main research perspectives which are rooted in the strategic management literature. The first perspective mirrors a market power imperative which views the firm as a "bundle of strategic activities aiming at adapting to industry environment by seeking an

attractive position in the market arena” (Spanos and Lioukas, 2001, p. 907). In the strategy literature, Porter’s (1980, 1991) competitive strategy framework is the dominant paradigm.

The second main research perspective is the resource-based view of the firm (RBV) which conceptualizes the enterprise as a “bundle of unique resources” (Penrose, 1959). Penrose asserts that the growth of the firm is both facilitated and limited by management search for the best usage of available resources (1959). These include tangible and intangible, human and nonhuman resources that are possessed or controlled by the firm and that permit it to devise and apply value-enhancing strategies (Barney, 1991; Wernerfelt, 1984). Therefore, assets, capabilities, processes, attributes, knowledge and know-how that are possessed by a firm and that can be used to formulate and implement competitive strategies are all inherently valuable resources of a firm. Unique resources and capabilities are discussed under a variety of names, e.g. distinctive competences, core competences, invisible assets, core capabilities, internal capabilities, embedded knowledge, corporate culture, and unique combinations of business experience (von Krogh & Roos, 1995). Spanos and Lioukas further assert that the firm’s unique resources should define the essence of strategy (2001).

Although the premises on which these two perspectives are based are not similar, strategic management researchers (Henderson & Mitchell, 1997; Spanos & Lioukas, 2001) have recognized the complementarity between the market-driven perspective of strategy and the resource-based view. (cited in Rivard, Raymond, & Verreault, 2005)

In this study, despite the complementary quality of both perspectives, I mainly focus on resource-based view in that it drives more directly from strategy research, and puts the emphasis on the importance of firm-specific capabilities (Henderson & Mitchell, 1997). The

resource-based view sees resources as inherently valuable, and holds that the firm's unique resources should define the essence of strategy (Spanos & Lioukas, 2001, p. 910).

However, the resource-based perspective also invites consideration of managerial strategies for developing new capabilities (Wernerfelt, 1984). In fact, there is the issue of control over these scarce resources which is considered as the source of a firm's economic profits (Teec et al., 1997). Therefore, issues such as 'skill acquisition', 'the management of knowledge and know-how' (Shuen, 1994) and learning become fundamental strategic issues (Teec et al., 1997). Accordingly, strategic management researchers such as Teec, Pisano, and Shuen (1997, pp.514-515) believe that the greatest potential for contributions to strategy comes from this dimension which encompasses skill acquisition, learning and accumulation of organizational and intangible or 'invisible' assets (Itami & Roehl, 1987).

Having been cited in Teec et al. (1997), winners in the global marketplace have been equipped with attributes such as timely responsiveness, agility and flexibility concerning product innovation. However, these qualities were not present on their own, but coupled with the management capability to effectively coordinate and redeploy the firm's internal and external competences (p.515). This makes it possible for firms to have accumulated valuable technology assets still lacking many useful capabilities. Therefore, Teec et al. refer to this "ability to achieve new forms of competitive advantage as 'dynamic capabilities' (1997, p.515)". In short, dynamic capabilities equip the firm with the "ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" thus achieving competitive advantage (Teece et al., 1997, p. 516). They further refine their definition as the "term 'dynamic' refers to the capacity [of the firm] to renew competences so as to achieve congruence with the changing business environment

(p.515).” For example, when time-to-market (TTM), and timing are critical, or when the rate of technological change in the industry is fast, the firm is required to react through certain innovative responses and compete in the industry. In addition, the “term ‘capabilities’ emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment (Teec et al., 1997, p.515).”

In view of the above, it can be concluded that dynamic capabilities are necessary, but not sufficient, conditions for a firm to compete successfully, and to gain competitive advantage (Kathleen et al., 2000). Dynamic capabilities, therefore, are “the antecedent organizational and strategic routines by which managers alter their resource base-acquire and shed resources, integrate them together, and recombine them-to generate new value-creating strategies (Grant, 1996; Pisano, 1994; cited in Kathleen et al., 2000, p. 1107).” Accordingly, scholars such as Henderson and Cockbur, 1994; Teece et al., 1997, consider these capabilities as “the drivers behind the creation, evolution, and recombination of other resources into new sources of competitive advantage (cited in Kathleen et al., 2000, p. 1107).”

In the following section, I will relate the organizational capability and dynamic capabilities to innovation capability as it lies in the heart of this research.

### **2.3.3 Innovation Capability**

Innovation is the key factor to generate a higher productivity and greater prosperity for the economy. A driving factor for much of the economic growth and rise in living standards in

the post world war II era is the rapid advances in technology and innovation (OECD, 2008). Undoubtedly, it represents today's competitive advantage, supported by mainstream capabilities in quality, efficiency, speed and flexibility (Lawson & Samson, 2001). Innovation can act as a powerful tool in the hands of firms to play a more dominant role in shaping the future of their firm and their industries (Lawson & Samson, 2001). Damanpour and Evan (1984) indicated that innovation is a key ingredient in building high performance organizations, especially, in the fast changing and complex environment. Therefore, innovation is a determining factor in the ability of firms to adapt to new constraints and to take advantage of new conditions. In simple terms, it is a response by a firm to today's turbulent business environment. Nevertheless, innovation mirrors change! It requires changes to existing routines and configurations, thus allowing the firm to discover new ways of combining its resources (Parashar & Singh, 2005). Drucker (1998) argued that to sustain innovation organizations need application of knowledge intensively with sources of innovation opportunities. Similarly, innovation is a main strategic tool to have a competitive advantage in complex environment (Hardaker et al., 1998) and it is a necessity, and not a luxury for long term success, growth, and sustainable performance to survive in the industry.

Firms that have high innovative capability will be more successful to develop new capabilities that will cause response to environment, competitive advantage and high performance (Hurley & Hult, 1998). Moreover, "higher levels of organizational innovativeness, when combined with resources [RBV] and other organizational characteristics, lead to greater innovative capacity (Hurley & Hult, 1998, p. 47)." Therefore,



as the capacity to innovate grows, the firm will be able to develop competitive advantage and consequently achieve higher levels of performance (Hurley & Hult, 1998).

Nonetheless, Extending the arguments on organizational capability and dynamic capability put forward earlier in this chapter to a capability view of innovation, it can be argued that innovation capability is one of the dynamic capabilities of the firm. Innovation, in fact, is not just all about knowledge creation and new idea generation, as it also involves the capabilities perspective. It involves the capability to identify the required process of novel knowledge creation and also sees the uniqueness on the basis of few other capabilities (Parashar and Singh, 2005).

Dynamic capabilities of a firm, (presented earlier under previous section 2.3.2) are defined as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (Teece et al., 1997). According to this argument, "processes represent a firm's ability to respond to a changing business environment, creating dynamic capabilities essential for success (Parashar and Singh, 2005, p.117)." Zollo and Winter (2002) have argued that the above approach leaves open the question of *where dynamic capabilities originate* (as cited in Parashar & Singh, 2005). These two scholars have raised this question because they believe that the "explicit examination of innovation has been omitted in the discussion of dynamic capabilities (Zollo & Winter, 2002)", notwithstanding the fact that as a key mechanism for organizational growth and renewal, innovation is central to the theory (Parashar & Singh, 2005). Innovation capability then represents a dynamic capability that an organization can build to compete effectively.

Furthermore, according to Lawson and Samson (2001), “innovation capability is proposed as a higher-order integration capability, that is, the ability to mould and manage multiple capabilities (p. 380)”. In their view, organizations possessing this innovation capability have the ability to integrate key capabilities and resources of their firm to successfully stimulate innovation (2001). In other words, an innovation capability is “the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders (2001, p. 384).” They further propose a mixed model comprising *vision and strategy, harvesting the competence base, organizational intelligence, creativity and idea management, organizational structure and systems, culture and climate, and management of technology* (Lawson & Samson, 2001). In this context, too, innovation capability contains an element or ingredient of dynamic capabilities of the firm. Un (2002) further asserts that innovative capability is *dynamic* as “it involves interaction between firms internal knowledge and the demands of the external market (p.E2).” Wang and Ahmed (2004) also highlighted innovation capability as a common factor for dynamic capabilities that refers to a firm’s ability to develop new products and/or markets, through aligning strategic innovative orientation with innovative behaviors and processes.

Thus, based on what has been discussed so far, it would be logical to base the logic and arguments of this research on four main theoretical underpinnings; namely, organizational capability, resource-based view of the firm, dynamic capability, and innovation capability. In what follows, previous research on innovation within the context of Malaysia is presented and the research gap is identified.

## 2.4 Gap and Research Question

There is lack of well-credited, academic research on innovation subject in the context of Malaysia. In fact, innovation research is very limited in both scope, i.e. variety of issues studies, and number of valid studies conducted. In what follows I touch upon the main areas of innovation research conducted in the Malaysian context and spotlight their scope.

The main coherent, yet not continuous with regular intervals, innovation research in Malaysia has been conducted by the Ministry of Science, Technology and Innovation (MOSTI), through its agency, the Malaysian Science and Technology Information Centre (MASTIC). This agency has been conducting national surveys of innovation labeled as NSI in the Malaysian manufacturing sector on a biannual or tri-annual basis since the mid-1990s (as cited in Lee & Lee, 2007). To conduct these NIS, MASTIC adopted the methodology which was primarily employed by the Community Innovation Surveys (CIS), conducted in Europe since the early 1990s. The first NSI survey (NSI-1) was conducted in 1995 (covering the period 1990-1994), the second (NSI-2) in 2000 (covering 1997-1999), the third (NSI-3) in 2002/2003 (covering the period 2000-2001) (Lee & Lee, 2007), and the latest (NSI-4) was published in 2006 (covering 2002-2004).

As an illustration, the main objective of latest survey, i.e. NSI-4, was to collect data on the state of technological development in the manufacturing sector. In this survey, the population of the study comprised 4000 firms in the manufacturing sector. A total of 486 firms responded (response rate: 12.5 per cent), out of which only 261 firms indicated that they carried out innovation activities (representing 53.7 per cent of the respondents). Moreover, it was found that the larger proportion of the non-innovating firms was 100 per cent locally-owned or state owned firms. (MASTIC, 2006)

What's more? Most of the innovating firms were involved in both product and process innovations, and the dominant source of their innovation came from within the firm, i.e. internal. Moreover, most important factors which hampered their innovation activities were: prevention, lack of information in the market, lack of qualified personnel, lack of information on technology, and organizational rigidities within firms. (MASTIC, 2006)

In addition to the above, increased employee satisfaction and reduced rate of employee turnover were considered among the most important impacts as a result of organizational and marketing innovations. (MASTIC, 2006)

In view of the above, it can be seen that these surveys mainly were designed to explore the status-quo of the innovating firms through capturing their demographics limited only to the firms in the manufacturing industry. However, important questions such as 'what does finally drive innovation in firms in Malaysia?' or 'How is innovation capability management viewed and dealt with by Malaysian firms?' have been remained unnoticed or unattended.

Other few important studies conducted on innovation in Malaysia also focused on issues such as assessment of Malaysia's innovation policy and performance (see Tidd & Brocklehurst, 1999)<sup>1</sup>; Financing innovation in Malaysia (see Lee & Lee, 2007); Internationalization of Innovative Capabilities (see Ariffin & Figueiredo, 2003)<sup>2</sup>; Innovation in South-East Asia and the role of transnational corporations in industrial development

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<sup>1</sup> Tidd and Brocklehurst reviewed the range of policy options pursued by national governments for generating innovation within domestic firms. They found that the Malaysian government had developed a coherent set of policies, which aim to move the economy; however, there was little evidence of the implementation of such aspirations.

<sup>2</sup> Their study focused on examining the extent to which firms in the electronics industry in Malaysia and Brazil have developed significant levels of innovative technological capabilities. Their paper drew on empirical evidence from 82 electronics firms. They found that the capabilities of most of the sampled firms in Malaysia and Brazil have been upgraded to carry out diverse types of innovative technological activities.

(Hobday, 1996)<sup>3</sup>; The importance of ownership and firm-level capabilities in electronics exports generated from Malaysia and Thailand (Rasiah, 2003)<sup>4</sup>.

In view of all these studies mentioned above, it can be noticed that the innovation literature in the context of Malaysia suffers greatly from the lack of focus on innovation capability in relation to firm's innovation performance. To the best of my knowledge and ability, no other study in the past has addressed this gap in the literature (the relationship between firm's innovation capability and its innovation performance) by exploring and analyzing the key drivers of innovation. Thus, considering this gap and in an effort to bridge it by researching where other research has left off, I present the main research question of this study as follows:

*What are the key drivers of innovation within firms in Malaysia from a product and process innovation perspective?*

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<sup>3</sup> His research mainly focused on innovation and technological progress. His research showed the importance of electronics to Malaysian economic growth and then analyzed innovation within the TNC subsidiaries, using case evidence based on an innovation audit of a number of electronics producers. It was set out to explore the meaning of "innovation" in the TNC subsidiary context and to examine TNC strategies towards technology and innovation. The paper raised key questions for Europe and the UK by developing a simple model to show how innovation in Malaysia fits within global technology strategies of the TNCs, comparing Malaysia with other locations such as Scotland and China.

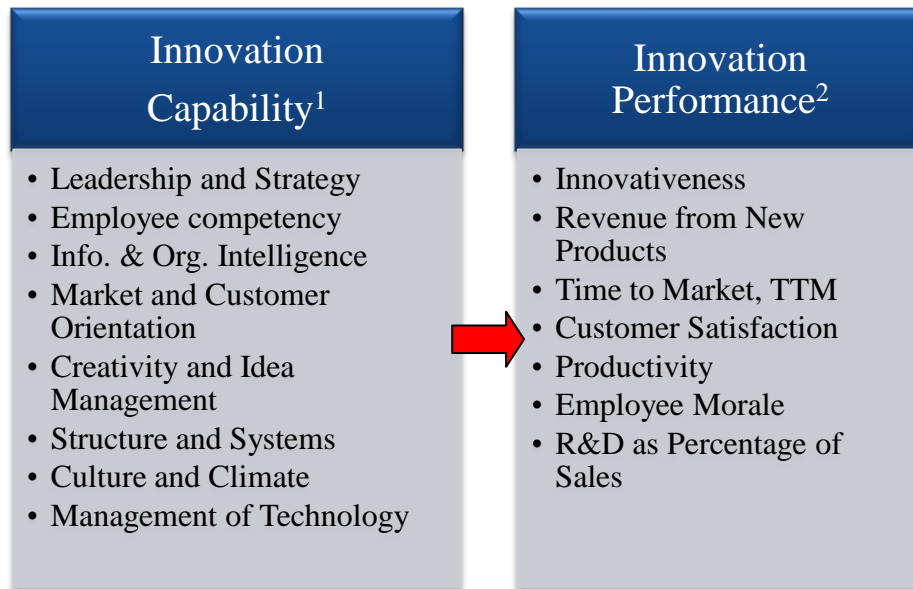
<sup>4</sup> His paper analyzed the hypothesis that exports drives and is driven by technological capabilities. Given their superior access to tangible and intangible assets and markets, it was hypothesized that foreign firms will be endowed with higher export and technological capabilities than local firms.

## **2.5 Theoretical Framework**

Many theoretical models of innovation at the organization level have attempted to investigate innovation capability so far (see Lawson & Samson, 2001; Tidd, Bessant, & Pavitt, 2005; Terziovski, Samson, 2007; etc.). These models have based their approaches on a variety of theories such as market orientation (MO), resource-based view, dynamic capability view, etc. However, none of these models and theories, on its own, can represent a comprehensive list of all relevant variables, nor explain all the variation in innovation performance. In fact, they are all complementary and together can paint a more complete picture of how innovation capabilities can or should be managed to generate the optimum outcome.

Moreover, “many have claimed that innovation management may be sector or industry specific, if not firm specific (as cited in Lawson & Samson, 2001, p. 378)”. However, Tidd et al. (2005) posit that based on evidence, a number of core elements and processes exist which aid effective innovation outcomes. Therefore, in order to have a valid framework, it is important to consider and incorporate these core elements into it. As a result, this study employs a theoretical framework which is mainly adopted from two important studies: 1) Terziovski and Samson, 2007; and 2) Lawson and Samson, 2001. Figure 2.2 illustrates the Theoretical Framework of this study.

Figure 2.2: Theoretical Framework



Source: Based on Lawson, and Samson (2001); Terziovski, and Samson (2007)

Note: 1= Independent Variable; 2= Dependent Variable

As explained earlier in this chapter, organizational capability is the ability of the firm to establish processes that create specific competence and meet strategic needs (Ulrich & Lake, 1990). These capabilities are considered as high-level routines that confer significant outputs (Winter, 2003). These capabilities are dynamic as the firm has the ability to build, integrate, and reconfigure internal and external competences to address rapidly changing environment (Teece et al., 1997, p. 516); or as Eishenhardt and Martin (2000) put it, dynamic capabilities are considered as organizational and strategic routines by which firms achieve new resource configurations as market evolved. In this model, according to Lawson and Samson (2001), *innovation capability* is regarded as a higher order integration capability, that is, the ability to mould and manage multiple capabilities (p. 380) and they propose a mixed model comprising vision and strategy, harvesting the competence base, organizational

intelligence, creativity and idea management, organizational structure and systems, culture and climate, and management of technology. In this context, innovation capability certainly has the attributes of dynamic capabilities of a firm; and it involves interaction between firm's internal knowledge and the demands of the external market (Un, 2002). Innovation capability is, therefore, *the ability [of the firm] to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders* (Lawson & Samson, 2001, p. 384).

### **2.5.1 Operationalization of the Variables**

This study has two main concepts (constructs). These are Innovation Capability and Innovation Performance. These are abstract forms of reality. For example, the construct-Innovation Performance is an abstract term that may, in concrete world of reality, refer to the sales of newly innovated products. Zikmund (2003) asserts that “researchers are concerned with the observable world, or what we shall loosely term ‘reality’ (p. 42)”. Therefore, to reduce the level of abstraction of these constructs and discuss them at empirical level, attempts have been made to define variables under each of them.

In this section, attempt has been made to describe how the independent variables and the only dependent variable which have been illustrated in the theoretical framework are operationalised.



### **2.5.1.1 Innovation Capability (IC)**

In order to develop a framework for managers to show that innovation as a process can be managed, systematized and replicated within an organization, Lawson and Samson (2001) used the resource-based view (RBV) of the firm (as cited in Terziovski & Samson, 2007, p. 364). This view conceptualizes the enterprise as a “bundle of unique resources” (Penrose, 1959). Penrose asserts that the growth of the firm is both facilitated and limited by management search for the best usage of available resources (1959). These include tangible and intangible, human and nonhuman resources that are possessed or controlled by the firm and that permit it to devise and apply value-enhancing strategies (Barney, 1991; Wernerfelt, 1984). Therefore, assets, capabilities, processes, attributes, knowledge and know-how that are possessed by a firm and that can be used to formulate and implement competitive strategies are all inherently valuable resources of a firm.

This view of the innovation capability spotlights the maturity of management capabilities, and difficult-to-imitate combinations of organizational, functional and technological skills, it integrates. It also draws upon research in such areas as the management of R&D, product and process development, technology transfer, intellectual property, manufacturing, human resources, and organizational learning (Terziovski & Samson, 2007). Lawson & Samson (2001) summarized the major characteristics of organizational innovation capability as follows:

- Vision and strategy;
- Harnessing the competence base;
- Leveraging information and organizational intelligence;
- Possessing a market and customer orientation;

- Creativity and idea management;
- Organizational structures and systems;
- Culture and climate;
- Management of technology.

Innovation Capability is the main independent construct in this research. As discussed above, it is operationalised through eight independent innovation capability variables. In this study, we use them with subtle nuances of name changes; insert them in the measurement instrument and define them in the following way. Therefore, innovation capability construct is operationalised through eight variables at empirical level. These are *Leadership and Business Strategy, Employee Competence, Information and Organizational Intelligence, Culture and Climate, Organizational Structure, Processes, Systems and Standards, Market and Customer Orientation, Creativity and Idea Management, and Management of Technology.*

*Leadership and Business Strategy.* “The link between vision, strategy and innovation is important to effective innovation management (Lawson & Samson, 2001, p.389.” In fact, it is the firm’s strategy which determines the configuration of resources, products, processes and systems that firms adopt to deal with the uncertainty existing in their environment (Lawson & Samson, 2001), i.e. addressing the changing environment in a dynamic fashion. As a matter of fact, successful innovation is strategy based and it requires a clear articulation of the strategy within the firm (Tidd et al., 2005). Common or shared vision is a critical step in institutionalizing innovation without which a strategy for innovation, interest and attention become too dispersed (Lawson & Samson, 2001).

This concept has been captured through the way top management has embedded innovation in the firm's strategy, and other sub-dimensions such as is it part of the mission statement of the firm? Is operations strategy aligned with innovation strategy? Do senior managers implement a culture of innovation? And is entrepreneurship widely supported at middle management level?

*Employee Competence.* After all, it is employee as a human being which innovates and not machines; making employee the lifeblood of any organization. Therefore, it is important to look at these resources as capital and invest in their development and well-being. This concept is captured in the form of recruiting creative people and employee development processes. It is also investigated through discovering if an organization value employee satisfaction and has effective "top-down" as well as "bottom-up" communication processes.

*Information and Organizational Intelligence.* Organizational intelligence is defined as "the capability to process, interpret, encode, manipulate and access information in a purposeful, goal-directed manner, so it can increase its adaptive potential in the environment in which it operates (Glynn, 1996, p. 1088)". Organizational intelligence is primarily about learning from customers and learning about competitors (Lawson & Samson, 2001, p. 391). Burgelman and Maidique (1988) posit that for a successful innovation management, it is of critical importance to understand both competitors and markets.

This concept is captured via: 1) the methods used by organizations to gather information about business environment; 2) the ways organizations learn about new products and processes; and 3) the areas within which organizations have undertaken benchmarking.

*Culture and Climate.* “In the absence of a supportive culture, creativity and innovation are like seedlings planted in arid, rocky soil. They won’t germinate and grow without it (The Innovator’s Toolkit, 2009, p. 212).” The social environment has been found to be capable of influencing the level of creative behavior (Amabile, Conti, Coon, Lazenby, & Herron, 1996). Therefore, an appropriate culture and climate which promote innovation is a necessity. This concept can be best measured through sub-dimensions such as organizational values, culture of accepting failure, TQM embedded in organizational culture, culture of meritocracy, reward system, and the fit between employees’ culture and the organizational culture.

*Organizational Structure, Processes, Systems and Standards.* Research (Ogbonna & Harris, 2000) that investigated the effect of organizational structures on innovation performance has shown that firms with a flexible organizational structure yield better performance in comparison to firms without it. Therefore, it is widely recognized that firms that demonstrate flexibility are better able to quickly reconfigure their resources and capabilities to focus on the opportunity in the marketplace (Wang, 2008). In the same fashion, Burgelman and Maidique (1988) state that successful innovation management depended on an optimal overall formal business structure. Furthermore, Lawson and Samson (2001) assert that “unless this structure and its resulting processes are conducive to a favorable environment, other components of the innovation system are unlikely to succeed (393)”.

This concept has been captured through sub-dimensions such as hierarchy, social networks, collaborative partnerships, and performance measurement integration systems which support organization’s innovation capability process.

*Market and Customer Orientation.* This dimension encompasses the idea that was put forward by many researchers including Thomke and von Hippel (2002) to focus on customers by carefully listening to them and respond with new products that meet or exceed their needs. In fact, innovation should be market driven. This happens when a firm creates value for customers. This concept is captured through sub-dimensions eliciting information on obtaining continuous market knowledge, customer value creation, inter-departmental links, customer service, and developing new process innovations.

*Creativity and Ideas Management.* In the heart of any innovation lies an innovative idea and creativity. However, employees' creativity needs to be triggered. Once activated, employees will generate ideas which may get lost if not properly managed. Therefore, issues such as employee involvement in learning programs, having suggestion schemes in place, employee skills development, and continuous improvement philosophy are among the tested dimensions under this concept.

Lastly, *Management of Technology.* Technology management is an important element of innovation; yet it is not all. Innovative firms are able to link their core technology strategies, with innovation strategy and business strategy (Lawson & Samson, 2001). As Fusfeld (1995) believes the shift towards external networks and leveraging the entire corporate knowledgebase has turned the spotlight on the management of technology within the organization as a whole, rather than R&D per se. This exodus addresses issues such as technology strategy, technology collaborations, and embedding technology within innovation capability.

### 2.5.1.2 Innovation Performance (IP)

Innovation is vital to firm long-term sustainability and better performance. Damanpour and Evan (1984) indicated that innovation is a key ingredient in building high performance organizations especially in the fast changing and complex environment. Therefore, innovation is a determining factor in the ability of firms to adapt to new constraints and to take advantage of new conditions. Consequently, innovation represents today's competitive advantage, supported by mainstream capabilities in quality, efficiency, speed and flexibility (Lawson & Samson, 2001).

In this study, the measurement of *firm's innovation performance*<sup>5</sup> is the key component and the dependent/outcome variable which is of primary interest. With the help of the current and extant literature, this study stressed the importance of innovation capability as a crucial means to achieve better firm's innovation performance. Innovation performance is defined as the contribution of product and process innovations to a firm's economic performance (Dornblaser et al.,1989; Brouwer and Kleinknecht, 1994; Archibugi and Pianta, 1996). This construct is captured through seven variables adopted from Terziovski and Samson's study (2007). These variables are: *revenue from new products developed in the last 1-3 years*, *innovativeness* (number of innovation adoptions and the time of innovation adoption), *time to market* (TTM), *customer satisfaction*, *employee morale*, *R&D as a percentage of total sales*, and lastly *ecological efficiency degree of recycling* (see Lawson & Samson, 2001; Terziovski & Samson, 2007).

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<sup>5</sup> The dependent variable in our research model is innovative performance. This variable is a mean score of eight items indicating performance improvements due to product and process innovations. Managers were asked to judge the performance improvements due to process and product innovations on a Likert scale with values ranging from 1 to 5.

In the heart of innovation performance lies the basic question- what really characterizes an entrepreneurial or innovative organization from other organizations? According to Morris and Kuratko (2008), it is the *innovativeness*. In fact, innovativeness is considered as the first dimension of entrepreneurship, thus it deserves to be further elaborated. Hurley, Hult and Knight (2004) and Woodside (2005) highlight that innovativeness is openness to newness and relates to the firm's capacity to engage in innovation. In order to evaluate the innovativeness of the firms, it is required to look at the innovative activities and relate them to performance of the firms. Table 2.2 summarizes this variable based on the literature in detail.

Table 2.2: Measurement of Innovativeness

Authors	Year	Discussion
Wolff & Pett	2006	R&D expenditures are a general indicator of a firm's effort to improve its operating processes, create new products, or improve/modify existing ones.
Freel	2005	Innovativeness is taken as a direct measure of the proportion of total sales derived from new and significantly improved products (goods and services) and/or processes.
McLean & Round	1978	Product innovation is measured by the proportion of total sales which compares completely new products, and the weighted proportion of total sales which consists of new, radically redesigned and slightly modified products.
Gu & Tang	2004	The commonly used innovation indicators are R&D propensities, patents, technology adoption and skills intensity.
Mairesse & Mohnen	2002	The intensity of innovation as characterized by a sales-weighted measure of innovation; the shares of sales in innovative products.
Hughes	2001	Innovative activity can be categorized as input measures of innovation such as expenditure on R&D and staff employed.
Damanpour	1991	Organizational innovation, or innovativeness, is typically measured by the rate of the adoption of innovations
Hull & Hage	1982	Innovativeness is measured by the number of patents acquired by companies
Daft & Becker, 1978; Damanpour, 1987; Ettlie et al., 1984		Studies defined rate of innovation adoption as the number of innovations adopted within a given period
Baldrige & Burnham, 1975		Studies defined innovativeness as the percentage of innovations
Blau&McKinley	1979	Organizational innovation, or innovativeness, is measured by the number of awards won by architectural firms

Source: Compiled by the Author

Table 2.2 clearly presents different views from different researchers; however, in this study, the focus of innovativeness is on measurement of the number of innovation adoptions and the time of innovation adoption.

## **2.6 Conclusion**

In this chapter, the literature pertaining to organizational innovation was reviewed. Organizational innovation was explained, innovation was defined, and innovation types were introduced and discussed. The scope and importance of the relevant theories of innovation were highlighted and the previous literature on innovation research in Malaysian context was critically presented and discussed. Subsequently, the research gap was developed and highlighted and the research question of the study was posed as ‘what the key drivers of innovation are within firms in Malaysia from a product and process innovation perspective?’

Finally, Theoretical Framework was developed and presented to illustrate the associations among innovation capability and innovation performance, and based on the theoretical framework and the relevant literature, the variables were operationalised. The next chapter outlines the research methodology.