

Determination of Innovation Capability of Organizations: Qualitative Meta Synthesis and Delphi Method

*Mostafa Momeni*¹, *Susanne Balslev Nielsen*², *Mahdi Haghighi Kafash*³

¹ PhD Candidate of Allameh Tabataba'i University; Guest Researcher at Technical University of Denmark; momeni.mostafa@gmail.com,

² Associate Professor of Technical University of Denmark, Lyngby, Denmark; sbni@dtu.dk,

³ Associate Professor of Allameh Tabataba'i University, Tehran, Iran; m.haghighi@atu.ac.ir

Abstract:

Characteristics of firms, especially service firms, are defined by rapid change, globalization, hyper innovative competition, etc., and recent research shows that one of the most dynamic capabilities that lead to the strongest competitive advantage in the organizations is the innovation capability. The innovation capability is associated with other organizational capabilities. So, many organizations have focused on the need to identify innovation capabilities and resources or strengths in relation to external opportunities and threats according to inside-out view because innovation capability has consistently been defined as a new service, a new product, a new technology, or a new administrative practice and process. Developing the innovation capability as an important aspect of dynamic capabilities of a firm is an important research project and it can help to achieve competitive advantage in this rapidly changing world.

This research focuses on recognition of the aspects of innovation capability and proposes a conceptual model based on a qualitative Meta-Analysis of academic literature on organisations innovation capability. This is proposed for the development of the concept of innovation capability in the organizations and this paper includes an expert based validation in three rounds of the Delphi method.

This research proposed a direct relationship between Innovation Capability and three main capabilities that is called Structural Capability, Personnel Capability and Operational Capability (S.P.O. Model). Also, it offers the most important indices which directly influence and are related to the Innovation Capability.

Key words: *Organizational Capabilities, Dynamic Capabilities, Innovation Capability, Personnel Capability, Structural Capability, Operational Capability.*

1. Introduction

To maintain the survival of organizations in the competitive context of the world today, organizations have no way out except attaining a competitive advantage (Porter, 1980; Barney, 1991). In order to explain the competitive advantage in organizations, two viewpoints are to be considered: The first approach which is based on the Industrial Organization Theory (Bain, 1968) in Michael Porter's ideas regards attainment of competitive advantage as resulting from environmental opportunities and is called the Market Based View (MBV). The analytical instruments utilized in this point of view are analysis of the value chain, analysis of competitive forces, generic strategies, competitiveness, clusters, competitive advantage of nations, etc. (Porter, 1980). Another approach the issues of which became common in the strategic management literature since the publication of the article "Resource Based Theory" by Wernerfelt 1984 is called the Resource Based View (RBV). This viewpoint has been investigated and developed by other experts and the related models have been appraised in organizations (Barney, 1986). Numerous studies in the last two decades have indicated that the competitive advantage based on internal capabilities of organization is the best origin for generation of success (Crook et al., 2008). The capabilities approach constitutes an extension to the resource based perspective (Helfat et al., 2007). In this conception, resources change through the action of capabilities approach, while some capabilities may deal specifically with adaptation, learning, and change processes. All capabilities have the potential to accommodate change (Helfat et al., 2003). Capabilities refer to the firm's ability to alter the resource base by creating, integrating, recombining and releasing resources (Eisenhardt & Martin, 2000). Also, many theorists have focused on the need to identify organizational capabilities and resources or strengths in relation to external opportunities and threats according to inside-out view of resource based approach in the firms (Bryson et al., 2007). So, capability translates to dynamic capability for Interaction of internal resources of organization with environmental opportunities (Teece et al., 1997-2009) and the innovation capability is one of most important dynamic capabilities that orientates the organization to adapting with environmental opportunities (Saunila et al, 2014). The innovation capability can be either a new product, a new service, a new technology, or a new administrative practice (Hage, 1999). This approach defines a capability for innovative organization as one that is intelligent and creative, capable of learning effectively and creating new knowledge (Lam, 2004).

An Investigation of scientific articles shows that most articles in the area of capabilities do not usually offer any recommendation concerning the procedures for management of the development of capabilities (Borjesson & Elmquist, 2011). In the innovation literature, researchers have pointed to the lack of a comprehensive theory or model of innovation and the related capabilities with a capacity for organizational understanding (Khalil, 2002).

For this purpose, this research follows to find factors influential on innovation capability of organizations through a procedure with provision of a comprehensive model and the theoretical confirmation of the model.

2. Research Method

This research is descriptive and non-experimental and employs a qualitative research method. Data collection is obtained through the following two ways:

- A. Qualitative Meta Synthesis of literature. The researchers reviewed most of valuable and scientific papers and articles in Innovation Capability field with critical consideration (Maxwell, 2013), so this research made a critical review on all of the articles that focused on innovation capability in the past decade. At last, the conceptual model proposed for the development of innovation capability in the organizations, and thus
- B. Delphi method, for the conceptual confirmation of the conceptual model (Boynton & Zmud, 1984) of innovation capability, an expert panel formed in three rounds (first round interview, 2 rounds of questionnaires). The panel include 20 innovation experts (number Academic Scholars and number Practitioners; which were elected as experts in organisational capabilities due to their research field or their Managerial role in an organisation with innovation as key business e.g. an entrepreneurship organisation; but also their availability).

The qualitative collected data (from both A and B) was coded and classified. Then the questionnaire data analysed by statistical analysis with Arithmetic Mean (Average in Statistics). The statistical measurements come out from five-step Likert questionnaire.

Table 1: Overview of the applied research design

In this research:	
Research Paradigm	Qualitative Research Paradigm
Methodology	Multi method: Meta Study and Delphi
Research Strategy	Qualitative Meta Synthesis and Delphi Panel
Data Collection	Documentations, Literature Review, Past Review, Structured and Semi Structured Interviews, Questionnaire Survey
Data Analysis	Open Coding and Statistical Analysis

As illustrated in table 1; the general research design is a multi-method study. It consists of step one: the generation of a conceptual model of innovation capability through the critical review of other researches by qualitative meta synthesis. In step two, a Delphi panel is set with innovation capabilities experts utilizing the snowball technic. Then, as the first round of Delphi, short structured interviews with individual experts. This was followed up by a second and third rounds of Delphi using a questionnaire. For data analyses of the answers, open coding (for literature review and interviews and statistical analysis (for structured interviews and questionnaire survey). Based on the prior knowledge experts of capability, we proposed a final conceptual model to describe and improve organisations innovation capability. Which consists of dimensions, components and indices.

3. Innovation Capability

Innovation capability consists of internal reinforcement procedures and processes. This process is a key mechanism for stimulation, measurement, and reinforcement of innovation (Lawson & Samson, 2001). Many authors consider innovative capabilities equal with being innovative or even innovative performance of aspects that could be quantitatively assessed (e.g. the number of inventions registered or the number of operations of a new product). Although these measures are useful pieces of information on the performance of the firm, they do not offer a picture of innovation capability of the firm. The concept of capability is not a performance parameter but it is an index of preparedness of the firm and the development through innovation forces (Borjesson & Elmquist, 2011). This research believes innovation capability is a great ability to provide innovative services and products continuously through the organizational capabilities, capacities and competencies. This definition is utilized by some other researches (Saunila et al., 2014; Saunila & Ukko, 2012; Sáenz et al., 2009; Lawson & Samson, 2001).

With reference to the summarized literature and the research paradigm of this study which is formulated on the systematic definitions of innovation, it is understood that innovation capability is dependent upon other capabilities in the organization which may be classified into three groups of Structural Capability, Personnel Capability and Operational Capability (S.P.O. model) as the main dimensions. The operational capability is very much dependent upon technological capacity and support capacity, and the personnel capability is dependent upon the individual knowledge capacity, finding of business environmental opportunity and idea generation ability which is based on creativity of human resources, and the structural capability is dependent on internal processes of organizations as managerial capacity, cultural capacity, communicative capacity and organizational knowledge capacity.

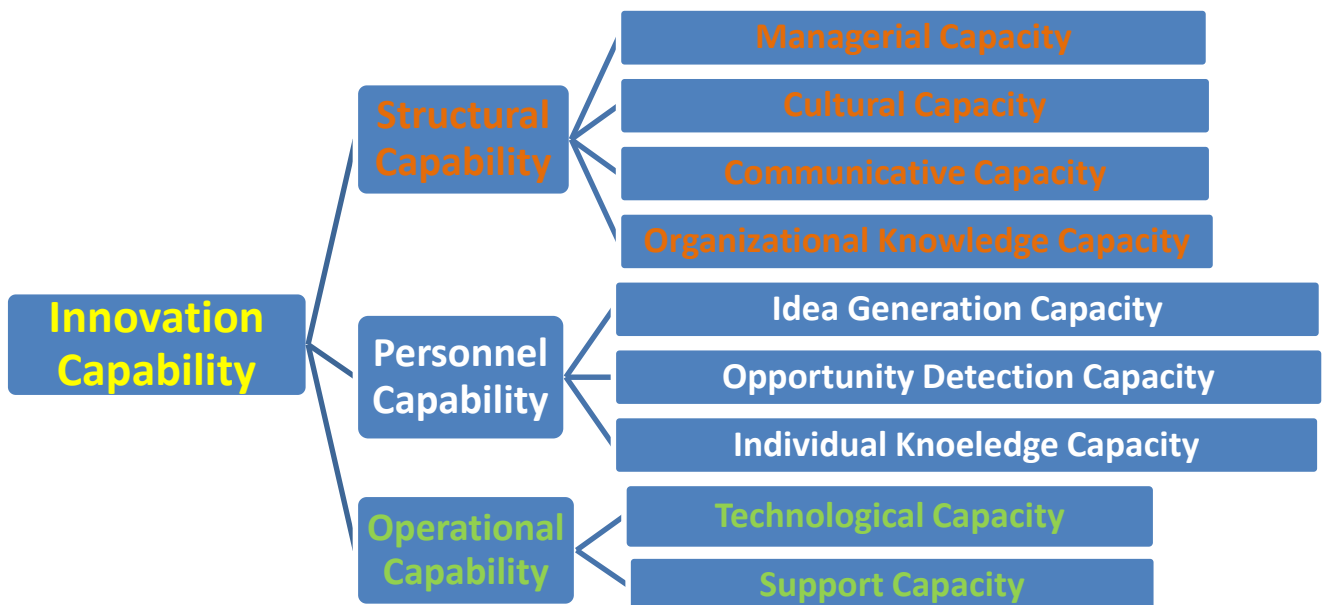


Figure 1: The S.P.O. Model of Innovation Capability (Structural Capability, Personnel Capability and Operational Capability).

3.1. Dimensions of Innovation Capability

Innovation is a complex technological, social, and economic process. Therefore, success is not measured through just one or two factors and no factor could be effective alone. As such, no management or technical tool or instrument can establish an efficient environment for innovation. In fact, what we obtain in research is a collection of different factors which should regularly establish and improve an innovation environment so as to guarantee the innovation success in an organization (Barnano, 2005). Innovation capacity completes as the result of several relationships and communication among organizational, resources, qualifications, and connections with other organizations (Hii & Neely, 2000).

Therefore, the innovation capability of a firm is not the result of one of its abilities but it flows from a collection of abilities and other capabilities, which means an internal potential for generation of new ideas, identification of new market opportunities, new services and products through resources and capabilities of a firm. Considering the literature reviews, this research believes innovation capability has been dependent on other capabilities in an organization and classifies them into three groups including: structural capability, personnel capability and operational capability.

3.1.1. Structural Capability

Structural capability is effective in the provision of organizational innovation capability since organizations should take the most advantage of their internal organizational situation and structures for development of new capabilities and reconstruction of the existing capabilities (Colarelli O'Connor & DeMartino, 2006). Structural capability states that in addition to operational dimension, the structural changes of an organization toward the establishment of a capability that causes the flow of the innovation capability in the organization plays a significant role for achieving success. Some define this as the capability for the formation of a stable structural mechanism for modification of all activities toward common goals for the purpose of an effect on the speed of innovation process through infrastructure for developmental projects (Guan & Ma, 2003) and some others refer to it as a structural mechanism of an organization for realization of innovation (Lichtenthaler & Lichtenthaler, 2009).

Of course, this research is of the opinion that structural capability is dependent upon four capacities in an organization: managerial capacity, cultural capacity, communicational capacity and organizational knowledge-based capacity which is based on the storage and generation of organizational knowledge and organizational learning.

With the emergence of large companies in the early twentieth century, many attractions have come up around the role and functions of managers (Chiesa et al., 1996). The issue has been dealt with in different scientific areas such as operation theory utilizing scientific knowledge on production systems, vertical and horizontal assimilation of provisional chains. They claim that the management of firms are able to carefully plan and coordinate

resources and capabilities of an organization (Zawislak et al., 2012). Structural changes of an organization toward establishing capabilities for the purpose of developing competitive superiority is understood only through managerial capacity (Zawislak et al., 2013). The innovation capability relates directly with managerial capacities such as planning an appropriate organizational structure, planning a mechanism for relationship with mainstream of an organization, multilevel management and a proper decision-making mechanism, use of innovation networks, budget and reward system based on innovation, strategic planning, and leadership style (Colarelli O'Connor, 2008). Also, studies show that there will be no improvement in the development of capabilities without an explicit and coordinated support by managers regarding the origin and outcome of capabilities (Borjesson & Elmquist, 2011). Certainly, Innovation increases the competitive advantage of firms, but for this purpose, a procedure is required for the management of new knowledge and skills which are applied for the daily management of firms (Tidd et al., 2005).

On the other hand, the management system which applies the innovation capability as a strategic capability for activating the cycle of innovation strategy and couples the existing trade with the strategic innovation system can achieve more success in the innovation capability (Kodama & Shibata, 2014). Also, it is necessary to emphasize that integration and coordination among other capacities for the establishment or development of organizational innovation capability is carried out by the management of an organization (Lichtenthaler & Lichtenthaler, 2009), this is combined in this study under the title of managerial capacity.

One of the other most important components of innovation capability is the knowledge of organization which are accumulate in personnel and information systems of organizations and firms (Skiltere & Jesilevska, 2013). Organizational knowledge refers to accumulated skills and expertise (Hefat et al., 2007) but many authors and theoreticians distinguish between exploration and creation of knowledge on the one hand, and exploitation of knowledge on the other (Bansal & Bonger, 2007). Moreover, some believe that organization of knowledge processes takes place beyond the boundaries of firms (Cassiman & Veugelers, 2006) and, of course, some authors have laid stress on the significant role of the combination of internal and external knowledge in the process of innovation. It is necessary to emphasize that restoration of the internal knowledge refers to generation of new knowledge within the firm and restoration of the external knowledge refers to the description of the acquisition of knowledge from outside sources (Lane et al., 2006). Exploitation of the internal knowledge is the description of the internal innovation and exploitation of the external knowledge refers to the transfer of knowledge to outside of the organization (Lichtenthaler, 2007).

Also, exploitation of knowledge involves repetition of new methods in different situations and implementation of the internal and external programs in various circumstances since organizations are different by nature and for survival in environmental changes make different choices for utilization of their innovations. And it is to be emphasized that maintenance of internal and external knowledge is related to organizational processes and guarantees the constant transfer of knowledge through which the best start for exploration, maintenance, and exploitation of knowledge takes place (Zollo & Winter, 2002).

For the purpose of the development of the concept of the capacity of organizational knowledge that refers to re-creation of dynamic capabilities, it is emphasized that dynamic capabilities provide for the capacity of an organization for the establishment, development, and change of its resources (Helfat et al., 2007). In accordance with this approach, firms

should dynamically embark on development of capacities for knowledge to benefit from the innovation (Chesborough, 2006).

Also, in the maintenance of knowledge, an organization confronts the issue of integration or dependence of knowledge which is a reference to the likelihood of the combination of internal and external knowledge. Of course, the complementary nature of internal and external processes of knowledge requires coordination in the organization (Cassiman & Veugelers, 2006). An organization needs reconstruction in its knowledge for boosting conformation ability or modifying environmental conditions earlier than competitors in order to be successful (Lichtenthaler & Lichtenthaler, 2009).

Absorption and maintenance of external knowledge for transfer to the organization should be considered seriously. Of course, for the purpose of gaining and having access to external knowledge, a firm should often provide for the transfer of a part of its knowledge to outside (Grant & Baden-Fuller, 2004).

In fact, the organizational knowledge capacity contributes to the revision of the source of innovation with the goal of surviving over time since the necessity for transfer and renewability of resources is considered a significant principle in dynamic capabilities (Lichtenthaler & Muethel, 2012) and also because organizations should activity renew and rearrange their innovative processes over time (Helfat et al., 2007).

Cultural capacity is represented by the organizations which have structured flexibility into their organizational culture to embed and encourages teamwork, creativity, learning and collaboration which creates value collectively (Verma et al., 2014). Cultural capacity is the culture executed by a learning organization with the aim of creating a culture to contribute to a valued outcome by enhancing organization's ability and thereby boosting innovation capability (Hung et al., 2010). Emphasizing cultural facets which impart comprise management backing for inspiring employees to work together, search, interact, and seek support toward innovation will lead to acquisition of capacity resulting in innovation (Verma et al., 2014).

Innovative activity may arise from any part of the organization process such as organizational communication abilities, entrepreneurial ability, adaptability, etc. Also communicative capacity contributes strongly to innovation, especially in services and in organisational innovation. A communication channel is a structural characteristic that can be used by a decision unit to achieve successful innovation implementation within organizations (Fidler & Johnson, 1984). The communicative capacity refers to organizational ability for networking and cooperating with other organizations (De Marchi, 2010).

3.1.2. Personnel Capability

This research believes that personnel capability is dependent upon three capacities in an organization: capacity for finding opportunities, capacity for generating ideas and capacity for individual knowledge which are based on the creativity and other abilities of human resources.

Finding and exploiting environmental opportunities has always been a big challenge for the organizations in confrontation with the dynamic environment (Lichtenthaler, 2007). Therefore organizations and firms need to develop new and special abilities and capacities

for exploitation of new environmental opportunities (Phillipset et al., 2005). This is because the firms which show more potential for exploitation of new ideas are said to possess more innovation capability compared with competitors (Francis & Bessant, 2005). So, the first step in the innovation process is finding, considering and establishing innovation opportunities for the organization (Lichtenthaler & Ernst, 2012). Also the dynamic capabilities approach has paid particular attention to exploration of new opportunities as a dynamic principle in capabilities and has described it under the title of sensing capacity (Lichtenthaler & Muethel, 2012). As a result and with precedence, innovation capability, which is the core capability concerning dynamicity, requires finding new ideas in the midst of opportunities. Thus, it can be stated that even more important than technical capacities, provision of applicable innovative pathways is the centroid of the innovation capability of any organization (Zawislak et al., 2012).

On the other hand, formulation of new ideas can be presented in the framework of a model, concept or program. New ideas can be a new service, a new product, a new technology, or a new technique for the management of staff (Soltani Tirani, 2008). Of course, exploration and generation of ideas include two major phases: A) Thinking of ideas as possible clues, and B) Selection of ideas, addition of other ideas, and re-implementation through change and combination of ideas (Sborn, 1992). Moreover, innovation capability is an internal stimulating energy for production and exploration of new ideas in utilization and examination of solutions for the detected environmental opportunity in the atmosphere of market, and it is argued that one way to develop this capability is to increase the absorption capacity of firms for these opportunities (Assink, 2006). Of course, for the purpose of idea generation activities, it is not enough to be creative; the whole process of survey, development, integration and implementation should be considered (Borjesson & Elmquist, 2011). Thus, the seizing capacity referred to in dynamic capabilities which attempts to create source values for the organization, assumes the role and responsibility for idea generation and conceptualization concerning availability in the process of innovation capability in an organization (Lichtenthaler & Muethel, 2012).

Also, should emphasise that the idea detection and generation capacity directly refer to personnel and staff abilities (Saunila et al., 2014; Raffai, 2014).

On the other hand, it is to be emphasized that the innovation capability refers to the ability of a firm to innovate through internal knowledge that is it indicates generation of knowledge within the personnel and staffs. This process of knowledge exploration starts with the understanding of particular opportunities by the ingenuity of expert personnel, and after the generation of the new knowledge, they have to maintain a relationship between this new knowledge and the environment opportunity (Shane, 2000). Of course, the process of knowledge generation usually requires time since an invention is more than a mere idea and the generation of new knowledge generally occurs in response to a need (Khilji et al., 2006).

For the purpose of recognition of environmental opportunities, personnel knowledge should be reactivated and assimilated with the new knowledge. Moreover, it should be internalized again through experience. Knowledge can be traded and changed since new knowledge over time so that they could employ and activate it later again (Pandza & Holt, 2007).

3.1.3. Operational Capability

The operational capability of an organization, which focuses on technological and operational activities and abilities of an organization, contributes to the achievement of organizational goals and is under the direct influence of a techno-loop. This is formulated in this study in the frame of operational capability in accordance with the researches carried out by other researchers as technological innovation concept (Figueiredo, 2002; Acur et al., 2010; Zawislak et al., 2012).

Among a collection of abilities which all firms utilize for the generation of various innovated products and services, technological capacity have achieved a prominent position in different studies. The concept of technological capacity of a firm is defined as the ability of a firm in the use of technology and combination and recombination of parts and constituents, and the relationship among constituents, procedures, processes and techniques (Afuah, 2002). Therefore, the development of technological capacity requires investment of time and resources to establish a structure for the development and maintenance of this capacity (Ho et al., 2011).

Among various capabilities of a firm, the technological capability is necessary to a greater degree. This is because it makes it possible for the firm to establish new concepts, processes, and solutions. For this reason, firms with innovative capabilities are more likely to increase their profit compared with the competitors (Patel & Pavitt, 1997).

With reference to the present features of competitive environments, while the level of competition is on the increase in the industry, the technological capability has increasingly been seen as a vital factor for the maintenance of long-term competitive advantage for firms (Acur et al., 2010).

Technological capacity of a firm is the result of learning processes (Jonker et al., 2006) which require ample use of knowledge and mobilization of scientific and technological resources so as to make the generation of the innovative products and services possible (Garcia et al., 2007). Therefore, the firms that have developed their technological capacity boost their chance of success compared with those who have less-developed technological capacity. It goes without saying that increase of this capability does not happen by chance but absorption, concordance, and change of the existing technology is necessary for the development of technological capability (Madanmohan et al., 2004).

Studies show that four basic aspects are inherent in the technological capability: A) Learning processes, B) Strategic focus on technology, C) Difficulties of abilities' transfer, and D) ability of Dynamics (Figueiredo, 2002).

In other words, the firm should be able to change its abilities, skills, and technological know-how. When this happens, it may be claimed that has technological capacity (Tello & Zawislak, 2013).

In addition, it may be stated that operational capability is also dependent on the transactional abilities of an organization. Achievement of competitive superiority through sales is facilitated by what is called transactional ability. Transactional ability is, in fact, all the activities that a firm performs to reduce marketing, bargaining, and delivery costs. In other words, reduction of transaction costs becomes possible through transactional ability. Of course, the role of transactional ability in the establishment of innovation capability for the firm is justified on the condition that when the firm can produce a product or a service with innovative superiority compared with similar goods and services on the market, it should be able to bargain it on the market. And because all firms permit the use,

management, and processing of their technology for the explicit and clear goal of positive economic income, they should have a certain abilities for trading their products and services (Zawislak et al., 2012).

Transactional ability should act in a way that this innovative technology does not transfer to competitors to make sure that it results in the maintenance of competitive advantage for the firm (Barney, 1991) and also the firm can absorb technological innovations in the industry. Of course, like all capabilities, capacities and abilities, transactional ability should be established, developed, and changed. In this process again learning plays a key role (Mayer & Argres, 2004). In fact, development of transactional ability will contribute to the development of innovation capability (Zawislak et al., 2012).

Also, the supportive capacity of an organization such as logistical and supportive process and the work place situation of an organization do an important role for developing of operational capability in order to innovation capability (Mello et al., 2008; Shan & Jolly, 2010; Zawislak et al., 2012).

3.2. Index

All the theoretical concepts should be segmented into dimensions to understand their various aspects. And on the next level, dimensions should be broken down to components. Also, for certain empirical aspects of a subject, components should disintegrate to indices (Bhattacharjee, 2012).

In this research innovation capability is the core concept of research, so the personnel capability, structural capability and operational capability are the main dimensions. Also, the main components and indices are listed in Table 2.

Table 2: Indices of Innovation Capability

Concept	Dimension	Component	Index
Innovation Capability	Personnel Capability	Opportunity Detection Capacity	Business Environmental Survey
			Accuracy, Attention, Intelligence
		Idea Generation Capacity	Creativity
			Practicality
		Individual Knowledge Capacity	Knowledge
			Experience
	Structural Capability	Managerial Capacity	Strategy And Goals
			Management Style

			Stability of Management
			Resource Availability
		Cultural Capacity	Flexibility
			Diversity
			Risk Acceptance
		Communicative Capacity	Networking
			Cooperation
		Organizational Knowledge Capacity	Organizational Learning
			Knowledge Storage
			Knowledge Absorption
	Information system		
	Operational Capability	Technological Capacity	Research & Development
			New Technology
		Support Capacity	Logistics
Work Place			

4. Results and Discussion

This research focuses on the main factors of Innovation Capability in organizations, which could be seen as new services, new products, new processes, etc.

The outcome of the Qualitative Meta Synthesis of literature, is a first version of the conceptual model; which was modified due to expert's comments in the first two rounds of the Delphi method. The first round was done by structured interviews, and we identified the dimensions and components as figure 1. Then at the second and third rounds, they confirmed components and indices as table 3 and table 4.

It should be emphasised that the agreement within the expert panel is significant. The scientific domination was as minimum 84% that was measured by some questions. It means that the data provided through the panel is very reliable for further studies and other researches and empirical applications. In addition, the participation of panel members has been rated as 90%, 85%, and 85% in the first, second and third rounds respectively.

The statistical measurements come out from Likert (5 steps) by the structured questionnaire in the first and second rounds. Also, the measurements are done for the components and dimensions through the "accept" or "not accept" (2 steps) questionnaire in the third round. Also, the measurements for indices are carried out through the five-step Likert questionnaire.

Table 3: Delphi Results, Dimensions and Components

Does Innovation Capability depend on:		Round 1	Round 2	Round 3	Result	Source
Dimensions	Personnel Capability	-	4.3	Yes	Approved	Interview
	Structural Capability	4.7	4.2	Yes	Approved	Literature
	Operational Capability	3.9	4.1	Yes	Approved	Literature
Components	Opportunity Detection Capacity	4.7	4.2	Yes	Approved	Literature
	Idea Generation Capacity	4.7	4.4	Yes	Approved	Literature
	Knowledge Based Capacity	4.5	-	-	-	Came from literature, but has been broken down to Individual Knowledge Capacity and Organizational Knowledge Capacity due to the expert's comments
	Individual Knowledge Capacity	-	4.4	Yes	Approved	
	Organizational Knowledge Capacity	-	4.7	Yes	Approved	
	Managerial Capacity	4.7	4.6	Yes	Approved	Literature
	Cultural Capacity	-	4.5	Yes	Approved	Interview
	Communicative Capacity	-	4.7	Yes	Approved	Interview
	Operational Capacity	3.8	-	-	-	Came from literature, but changed to support capacity by the expert's comments
	Support Capacity	-	4.4	Yes	Approved	
	Technological Capacity	4	4.5	Yes	Approved	Literature
	Transactional Capacity	2.8	-	-	Refused	Literature

Table 4: Delphi Results, Indices

Component	Index	Delphi	Result
Opportunity Detection Capacity	Business Environmental Survey	4.2	Approved
	Accuracy, Attention, Intelligence	4.6	Approved
Idea Generation Capacity	Creativity	4.8	Approved
	Practicality	4	Approved
Individual Knowledge Capacity	Knowledge	4.5	Approved
	Experience	4.4	Approved
Managerial Capacity	Strategy And Goals	4.6	Approved
	Management Style	4.4	Approved
	Stability of Management	4.1	Approved
	Resource Availability	4.2	Approved
Cultural Capacity	Flexibility	4.4	Approved
	Diversity	4.1	Approved
	Risk Acceptance	4.4	Approved
Communicative Capacity	Communication Network	4.7	Approved
	Cooperation with others	4.3	Approved
Organizational Knowledge Capacity	Organizational Learning	4.7	Approved
	Knowledge Storage	4.3	Approved
	Knowledge Absorption	4.6	Approved
	Information system	4.2	Approved
Technological Capacity	Research & Development	4.5	Approved
	New Technology	4.2	Approved
Support Capacity	Logistics	3.8	Approved
	Work Place	4	Approved

5. Conclusion

Recent research shows that one of the most dynamic capabilities that lead to strongest competitive advantage in the organizations is innovation capability. The innovation capability is connected with to other organizational capabilities. The innovation capability is defined as a great ability to provide innovative services and products continuously through the organizational capabilities and capacities.

This research focuses on the recognition of the facets of innovation capability and proposes a comprehensive model of Innovation Capability in three main capabilities that is called Structural Capability, Personnel Capability and Operational Capability (The S.P.O. Model).

There are found to be nine components under these three dimensions; Structural Capability is dependent on Managerial Capacity, Cultural Capacity, Communicative Capacity and Organizational Knowledge Capacity. Personnel Capability is recognized as Opportunity Detection Capacity, Idea Generation Capacity and Individual Knowledge Capacity. And the Operational Capability is through determined Technological Capacity and Support Capacity. In addition, this research identifies 23 indices as the most important elements which directly influence and are related to Innovation Capability.

This research aim at developing the innovation capability as a significant aspect of dynamic capabilities of an organisation. Organizations and companies can apply the suggested conceptual model to review their organisational innovation capability and to continuously improve their internal resources.

The generic character of this study calls for further research in this research topic and in specific empirical domains. This research could investigate the practical implementation of the SPO model and generate more specific recommends of how to apply this model in organizations and firms.

References

- Acur, N., Kandemir, D., Weerd-Nederhof, P., Song, M. (2010), Exploring the impact of technological competence development on speed and NPD program performance. *Journal of Production Innovation of Management*, 27 (6).
- Afuah, Allan N. (2002), Mapping technological capabilities into product markets and competitive advantage, *Strategic Management Journal* 23 (2).
- Assink, M. (2006), The Inhibitors of disruptive innovation capability: a conceptual model, *European Journal of Innovation Management*, Vol. 9, No. 2, 215–233.
- Bain, J.S. (1968) *Industrial organization* (2nd Ed.). New York: Wiley.
- Bansal, P., Bogner, W.C. (2007). Knowledge management as the basis of sustained high performance, *Journal of Management Studies*, 44, 165–188.

- Barnano A. M. (2005), Getting innovation Technology, *Revista Brasileira Journal*, v. 4, n. 1, 57–96.
- Barney, J. B. (1986), Organizational Culture: Can It Be a Source of Sustained Competitive Advantage, *Academy of Management Review*, 11.
- Barney, J. B. (1991), Firm Resource and Sustained Competitive Advantage, *Journal of Management*, 17.
- Bhattacharjee, Anol (2012) *Social Science Research: Principles, Methods, and Practices*. Florida: Creative Commons Attribution Publications.
- Börjesson, Sofia & Elmquist, Maria (2011), Developing Innovation Capabilities: A Longitudinal Study of a Project at Volvo Cars, *Creativity and Innovation Management*, 20 (3), 176 .
- Boynton, A. C. & Zmud, R. W. (1984). An assessment of critical success factors. *Sloan Management Review*, 25(3), 17-27.
- Bryson, J. M., F. Ackermann, et al. (2007). Putting the resource-based view of strategy and distinctive competencies to work in public organizations. *Public Administration Review* 67(4): 702-717.
- Cassiman, B., Veugelers, R. (2006). In search of complementarity in innovation strategy: internal R&D and external knowledge acquisition, *Management Science*, 52, 68–82.
- Chesbrough, H. (2006), *Open Business Models: How to Thrive in the New Innovation Landscape*, Boston: MA: Harvard Business School Press.
- Chiesa, V., Coughlan, P. & Voss, C.A. (1996), Development of a technical innovation audit, *Journal of Product Innovation Management*, Vol. 13, 105–136
- Colarelli O'Connor, G. (2008), Major Innovation as a Dynamic Capability: A Systems Approach, *Journal of Product Innovation Management*, 25, 313–30.
- Colarelli O'Connor, G., DeMartino, R. (2006), Organizing for Radical Innovation: An Exploratory Study of the Structural Aspects of Management Systems in Large Firms, *Journal of Product Innovation Management*, 23, 475–97.
- Crook, T. Russell, Ketchen Jr, David J., Combs, James G., Todd, Samuel Y. (2008). Strategic resources and performance: a meta-analysis. *Strategic Management Journal*. Vol 29 (11), 1141–1154.
- De Marchi, Valentina (2010). Cooperation toward Environmental Innovation: An Empirical Investigation. SSRN Working Paper Series; <http://search.proquest.com/openview/a9cded7ba04407d25cbd85a1744d67e7/1?pq-origsite=gscholar>
- Eisenhardt, K. M. and J. A. Martin (2000). "Dynamic Capabilities: What Are They?" *Strategic Management Journal* 21: 1105-1121.
- Fidler, Lori A., Johnson J. David (1984). Communication and Innovation Implementation. *The Academy of Management Review*. Vol. 9, No. 4. 704-711.

- Figueiredo, P. (2002), Does technological learning pay off? Inter-firm differences in technological capability-accumulation paths and operational performance improvement, *Research Policy*, 31 (1).
- Francis, D., Bessant, J. (2005), Targeting Innovation and Implications for Capability Development, *Technovation*, 25, 171–83.
- Garcia-Muiña, F., Navas-Lopez, J. (2007), Explaining and measuring success in new business: The effect of technological capabilities on firm results, *Technovation*, 27 (1-2), 30-46.
- Grant, R., Baden-Fuller, C. (2004), A knowledge accessing theory of strategic alliances, *Journal of Management Studies*, 41, 61–84.
- Guan, J., Ma, N. (2003), Innovative capability and export performance of Chinese firms, *Technovation Journal*, V. 23, N. 9, 737–747.
- Hage, J. T. (1999). Organizational Innovation capability and Organizational Change. *Annual Reviews*, No. 25, 597-622.
- Helfat, C.E., Peteraf, M.A. (2003), The Dynamic Resource Based View: Capability Lifecycles, *Strategic Management Journal*, 24.
- Helfat, Constance E. & S. Finkelstein, & W. Mitchell, & M. Peteraf, & H. Singh, & D. Teece, & S. Winter (2007), *Dynamic Capabilities: Understanding strategic change in organizations*, London; Oxford: Blackwell, 30-45.
- Hii, J., Neely, A. (2000), Innovative capacity of firms: on why some firms are more innovative than others, *International Annual Europa Conference*, 7, Ghent, Proceedings, Brussels: Euroma,.
- Ho, YC., Fang, HC. & JF., Lin (2011), Technological and design capabilities: is ambidexterity possible?, *Management Decision*, 49 (2).
- Hung, Richard Yu Yuan, Yang, Baiyin, Lien, Bella Ya-Hui, McLean, Gary N., & Kuo, Yu.-Ming (2010). Dynamic capability: Impact of process alignment and organizational learning culture on performance. *Journal of World Business*, 45, 285–294.
- Jonker, M., Romijn, H., Szirmai, A. (2006), Technological effort, technological capabilities and economic performance: A case study of the paper manufacturing sector in West Java, *Technovation*, 26 (1).
- Khalil, Taregh (2002), *Technology Management*, translated by Mohamad Arabi and Davood Eizadi, Tehran: Cultural Research's Office Pub.
- Kodam, Mitsuru, Shibata, Tomoatsu (2014), Strategy transformation through strategic innovation capability: a case study of Fanuc, *R&D Management Journal*, 44 (1), 75-103.
- Lam, Alice (2004). Organizational Innovation capability, *Brunel Research in Enterprise, Innovation capability. Sustainability and Ethics*, Working Paper No. 1, 12.
- Lane, P. J., Koka, B. R., Pathak, S. (2006), The reification of absorptive capacity: a critical review and rejuvenation of the construct, *Academy of Management Review*, 31, 833–863.

- Lawson, Benn, Samson, Danny (2001), Developing Innovation Capability in organizations: a dynamic capability approach, *International Journal of Innovation Management*, Vol. 5, No. 3, 377–400.
- Lichtenthaler, Ulrich (2007), The drivers of technology licensing: an industry comparison, *California Management Review*, 49, 67–89.
- Lichtenthaler, Ulrich, Ernst, H. (2012), The performance implications of dynamic capabilities: The case of product innovation, *Journal of Product Innovation Management*, in press.
- Lichtenthaler, Ulrich, Lichtenthaler, Eckhard (2009), A Capability Based Framework for Open Innovation: Complementing Absorptive Capacity, *Journal of Management Studies* 46:8, 1315- 1338.
- Lichtenthaler, Ulrich, Muethel, Miriam (2012), The Impact of Family Involvement on Dynamic Innovation Capabilities: Evidence From German Manufacturing Firms, *Journal of Entrepreneurship Theory and Practice*, Baylor University, 1235-1253.
- Madanmohan, T., Kumar, U., Kumar, V. (2004), Import-led technological capability: a comparative analysis of Indian and Indonesian manufacturing firms, *Techno-vation*, 24 (12).
- Maxwell, Joseph A. (2013) *Qualitative Research Design*, New York: SAGE Publications, Third Edition.
- Mayer, K., Argyres, N. (2004), Learning to contract: Evidence from the personal computer industry, *Organization Science*, 15 (4), 394-410.
- Mello, Adriana Marotti et al. (2008), Innovative Capacity and Competitive Advantage: a case study of Brazilian firms, *Revista de Administração Journal*, v. 5, n. 2, 57-72.
- Pandza, K., Holt, R. (2007), Absorptive and transformative capacities in nanotechnology innovation systems, *Journal of Engineering & Technology Management*, 24, 347–365.
- Patel, P., Pavitt, K. (1997), The technological competencies of the world’s largest firms: complex and path-dependent, but not much variety, *Research Policy*, 26 (2).
- Phillips, W., Noke, H., Bessant, J. & Lamming, R. (2005), Beyond the Steady State: Managing Discontinuous Product and Process Innovation, *International Journal of Innovation Management*, 10, 175–96.
- Porter, Michael E. (1980), *Competitive Advantage: Techniques for Analyzing Industrial and Competitors*, New York: Free Press.
- Raffai, Csilla (2014), Investigating the Innovation Capability Maturity of Rural Accommodation Service Providers, University of Pannonia, PhD Dissertation. 8-28.
- Sáenz, J., Aramburu, N., Rivera, O. (2009), Knowledge sharing and innovation performance; a comparison between high tech and low tech companies, *Journal of Intellectual Capital*, 10 (1), 22– 36.
- Saunila, Minna, Ukko, Juhani (2012), A Conceptual Framework for the Measurement of Innovation Capability, *Baltic Journal of Management*, Vol. 7, No. 4.

- Saunila, Minna, Ukko, Juhani, Rantanen, Hannu (2014), Does Innovation Capability Really Matter for the Profitability of SMEs?, *Knowledge and Process Management*, Vo 21, N 2, 134 –142.
- Sborn, Alex (1992), *Foster innovation and creative talent for the public*, translated by Hasan GhasemZadeh, Tehran: Niloofar Pub.
- Skiltere, Daina & Jesilevska, Svetlana (2013), Building the System of Innovation Capability Indicators: Case of Latvia, *Eurasian Journal of Business and Economics*, 6 (12), 113-128.
- Soltani Tirani, Flora (2008), *Institutional Innovation in Organizations*, Tehran: Cultural services Pub., 2th Edition.
- Shane, S. (2000), Prior knowledge and the discovery of entrepreneurial opportunities, *Organization Science*, 11, 448–469.
- Shan, Juan, Jolly, Dominique R. (2010), Accumulation of Technological Innovation Capability and Competitive Performance in Chinese firms: A quantitative study, IAMOT 2010, Cairo Conference, Egypt, March 8-11, 1-21.
- Teece, David J. (2006), Reflections on Profiting from Innovation, *Research Policy*, Vol. 35, N. 8, 1131-1146.
- Teece, David J. (2009), *Dynamic Capabilities and Strategic Management: Organizing for Innovation and Growth*, Oxford University Press.
- Teece, D. J., & Pisano, G., & Shuen, A., (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, 18.
- Tello-Gamarra, Jorge, Zawislak, Paulo Antônio (2013), Transactional capability: Innovation's missing link, *Journal of Economics, Finance and Administrative Science*, 18(34).
- Tidd, J., Bessant, J. & Pavitt, K. (2005), *Managing Innovation, Integrating Technological, Market and Organizational Change*, 3rd edition. John Wiley & Sons, New York.
- Verma, Pratibha, Singh, Bindu & Rao, M.K. (2014), Developing Innovation Capability: The Role of Organizational Learning Culture and Task Motivation, *Global Journal of Finance and Management*, Vol 6, No 6, 575-582.
- Zawislak, & Alves, A., Tello-Gamarra, J., Barbieux, D., Reichert, F. (2012), Innovation Capability: From Technology Development to Transaction Capability, *Journal of Technology Management and Innovation*, Vol. 7, N. 2.
- Zawislak, P.A.; Alves, A.C.; Gamarra, J.T.; Barbieux, D.; Reichert, F.M. (2013), Influences of the Internal Capabilities of Firms on their Innovation Performance: A Case Study Investigation in Brazil. *International Journal of Management*, 30 (2), 329-348.
- Zollo, M., Winter, S.G. (2002), Deliberate learning and evaluation of dynamic capabilities, *Organization Science*, 13 (3), 339-351.