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Impact of Personnel Capabilities on Organizational Innovation Capability

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Abstract

One of the most dynamic capabilities that lead to the strongest competitive advantage in the organizations is the innovation capability. Analysing the development of a firm's innovation capability is an important research project, and can help organizations to achieve competitive advantage in this rapidly changing world.

This research focuses on definition of the personnel aspect of innovation capability, and proposes a conceptual model based on the scientific articles of academic literature on organisations innovation capability. This paper includes an expert based validation in three rounds of the Delphi method. And for the purpose of a better appreciation of the relationship dominating the factors of the model, it has distributed the questionnaire to Iranian companies in the Food industry. This research proposed a direct relationship between Innovation Capability and the Personnel Capability. Also, it offers the most important components and indices which directly influence and are related to the Innovation Capability.

Keywords: Innovation Capability, Personnel Capability, Individual Knowledge Capacity, Opportunity Detection Capacity, Idea Generation Capacity.

Innovation Capability

The innovation capability is associated with other organizational capabilities. Innovation capability has consistently been defined as a new service, a new product, a new technology, or a new administrative practice and process. 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).

Personnel Capability

Innovation is a complex technological, social, and other process of organizations. Therefore, success is not measured through just one or two factors and no factor could be effective alone (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.

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., 2006). 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 dynamic, 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. 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). In other words, 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 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 could be employed and activated it again later (Pandza & Holt, 2007).

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. Critical Review 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. The Delphi study is flexible in its design, and amenable to follow up interviews. This permits the collection of richer data leading to a deeper understanding of the fundamental research questions (Okoli & Pawlowski, 2004). The Delphi method is commonly used in the area of management and capabilities (Petra et al., 2007; Pierre et al., 2012; Cho & Lee, 2013; Detcharat et al., 2013). For the theoretical confirmation of the conceptual model of innovation capability, an expert panel formed, and three rounds of a Delphi process was undertaken (first round interview, 2 rounds of questionnaires). The panel include 20 innovation experts (number Academic Scholars from Iranian and European Universities 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).

C. Survey, for the purpose of a better appreciation of the relationship dominating the factors of the model confirmed in Delphi rounds, this research has distributed the questionnaire in 55 Iranian companies of the food industry. The major audience of the survey are the managing directors and deputies of these firms, and 43 firms have responded to the questionnaire. Some firms have completed more than one questionnaire, the average of which is computed and only one representative of every firm is considered in the final appraisal.

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

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. In step two, a Delphi panel is set with innovation capabilities experts utilizing the snowball technique. Then, as the first round of Delphi, short semi 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. In addition, for definition of the relation between factors, we employed the structural equation modelling (SEM) in AMOS software.

Research Results

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 rounds of the Delphi method. The first round was done by structured interviews, and we identified the dimension and components as figure 1. Then at the second and third rounds, they confirmed components and indices as table 1 and table 2.

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 were based upon 5 step Likert scale within the structured questionnaire in the first and second rounds.

Table 1 Delphi Results, Dimension and Components

Does Innovation Capability depend on:		Round 1	Round 2	Round 3	Result	Source
Dimensions	Personnel Capability	-	4.3	Yes	Approved	Interview
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 changed to Individual Knowledge Capacity due to the expert's comments
	Individual Knowledge Capacity	-	4.4	Yes	Approved	

Table 2: 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

Discussion

With reference to the summarized literature and the research paradigm of this study, which is formulated on the systematic definitions of innovation, and based on the comments of experts, it is understood that innovation capability is dependent upon other capabilities in the organization, and one of the main aspect of innovation capability is personnel capability. 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.

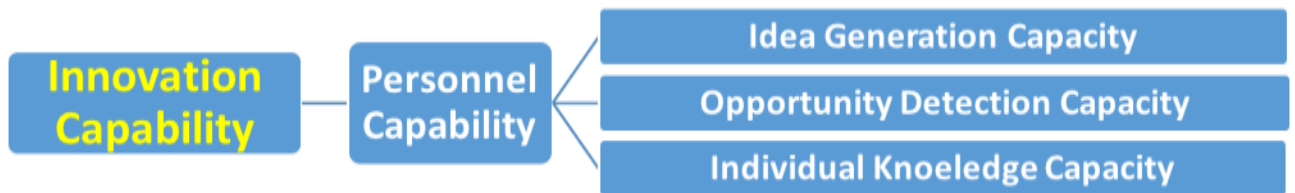


Figure 1: Personnel Capability Model toward Innovation Capability

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 results in internal potential for generation of new ideas, identification of new market opportunities, new services, and products through the resources and capabilities a firm has access to.

This research finds that one of the main aspect of innovation capability is personnel capability, and the 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. The first step in the innovation process is finding, considering and establishing innovation opportunities for the organization and the second is formulation of new ideas based on opportunities. Also the recognition of environmental opportunities, personnel knowledge should be reactivated and assimilated with the new knowledge and it should be internalized again through experience.

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 is the main dimension of innovation capability. Also, the main components and indices are listed in Table 3.

Table 3: 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

Moreover, for the purpose of a better appreciation of the relationship dominating the factors confirmed in Delphi stages, this study has embarked on a survey of 55 large firms that are active in the Iranian food industry in order to describe the priorities and significance of the factors and the relationship among them. This is carried out through the construction of a questionnaire based on the extracted indices and then the distribution of the questionnaire in the sample population to which 43 firms have responded. Based on the statistical results, the weight regression of the factors- in accordance with the structural equations modelling (SEM) of the AMOS, are presented in Figure 2.

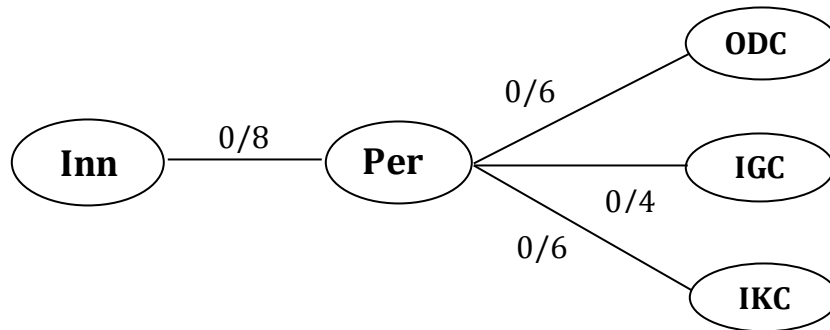


Figure 2: SEM of Personnel Capability's Components toward Innovation Capability

In figure 2, "Inn" is abbreviation of "Innovation Capability"; "Per" is "Personnel Capability"; "ODC" is "Opportunity Detection Capacity"; "IGC" is "Idea Generation Capacity" and "IKC" is "Individual Knowledge Capacity". This figure shows the personnel capability can explain about 81 percent the innovation capability. It means the personnel capability and its components could load on the innovation capability as main concept of the research. Also the components of personnel capability (Opportunity Detection Capacity, Idea Generation Capacity and Individual Knowledge Capacity) have meaningful relation with Personnel Capability.

Also, the list of the indices, based on the quantitative significance and priority of the mean and Variance, is provided in Table 4.

Table 4: Priority of Indices based on Industry comments

Priority	Index	Component
1	Creativity	Idea Generation Capacity
	Business Environmental Survey	Opportunity Detection Capacity
	Knowledge	Individual Knowledge Capacity
	Experience	Individual Knowledge Capacity
2	Accuracy, Attention, Intelligence	Opportunity Detection Capacity
	Practicality	Idea Generation Capacity

Conclusion

One of the most dynamic capabilities that lead to significant 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 model of Innovation Capability with a focus on individual Personnel Capability of employees. There are three components under Personnel Capability. It is dependent on Opportunity Detection Capacity, Idea Generation Capacity, and Individual Knowledge Capacity. In addition, this

research identifies 6 indices as the most important elements which directly influence and are related to Innovation Capability.

Based on the observations made, three major groups are regarded as the active human resource in Iran's food industry. The first group are the production line workers who generally have little Knowledge and superficial experiences. The second group comprises office workers and general experts who take on administrative and non-professional duties of an organization or firm, and quite obviously these two groups are not the addressees of the recommendations and suggestions made in this study. The third group includes the experts, engineers, professionals, and managers who are generally active in technical, research and development, quality control, and business sections and who are the major addressees of the recommendations of this study on the subject of personnel capability.

It is recommended that food industry Organizations and first that intend to make attempts in the development of their innovative capability, pay special attention to their personnel capability in such a way that their staff (the third group) become more creative and more careful so that, along with the recognition of innovative opportunities in the environment, they may attempt to generate new ideas. This significant affair may be realized through infrastructure of knowledge of the staff and it is of paramount importance to reorganize staff based on applied and up-to-date knowledge for this purpose.

Of course the recommendation for the firms which concentrate on the generation of innovative ideas is to pay more attention to staff creativity, precision, and knowledge. And regarding the organization which proceed with their innovation plans in accordance with absorption from environment, attention to environment precision and knowledge-centeredness of staff becomes necessary.

Table 5: Formation of Personnel Capability in Iran’s Food Industry

Personnel Capability	
Focus on experts, engineers, professionals, and managers who are generally active in technical, research and development, quality control and business sections of Iran’s Food Industry	
Enhancement of the capacity for recognition of environmental opportunity	Attention + precision + smartness + survey of business and work environment
Enhancement of the capacity for idea generation	New and creative idea + feasibility of the idea
Enhancement of the capacity for individual knowledge	Up-to-date knowledge + professional experience

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 model and generate more specific recommends of how to apply this model in organizations and firms.

The most important limitation of the study is the impossibility of cooperative observation for the purpose of finding the capabilities in the industry. This is because the precise understanding of the nature of the capability requires cooperative observation by the researcher. Thus, this study has utilized alternative methods of data gathering. And regarding the findings of this study, it is recommended that creativity indexes for idea generation and opportunity seizing in the environment be focused on for the purpose of the establishment of personnel capability, which is possible with the knowledge and experience of the staff.

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