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The Relationship between Agility Capabilities and Organizational Performance: a Case Study among Home Appliance Factories in Iran

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Abstract

Agility capabilities are considered as inescapable features of today's forward-looking organizations. Those organizations which possess such characteristic would be able to achieve competitive advantage and gain an edge over competitors. In this regard, this paper seeks to explore the agility capabilities of manufacturing firms and its' impact on organizational performance. Moreover, this study investigates the key principles and features of the agile manufacturing companies and agile manufacturing dimensions. Given the importance of agility capabilities compared to other features of manufacturing companies, this component is selected for the study and its effect on corporate performance is also examined. This study adopts the descriptive survey method and uses questionnaire for the purpose of data collection. Also, the inferential statistical technique is applied in order to data analysis. Spearman's rank correlation coefficient is used to test the hypotheses and the key informants are the managers and employees of manufacturing companies in Iran. The data analysis reveals that there is a significant positive relationship between agility capabilities and performance of the company in the confidence level of 0.99.

Keywords: Agility, Agility Capabilities, Organizational performance, Organizational agility

1. Introduction

In fact, quickness can be perceived as the most pivotal wealth in the third millennium and today's information age era. To reduce response time and improve the flexibility, new forms of organizations should be designed. Nowadays competition consists of many different aspects of business activities such as product delivery time, delivery speed, customer service, product or service quality and product price. In this regard, organizations should focus on widely sharing of information on the production, assembly, distribution and other different segments of the supply chain. Accordingly, if this process gradually becomes faster and faster, organizations can respond faster to the market demand and satisfy customer needs. The rapid pace of change in technology and work circumstances threatens organizational survival. There are a few organizations that can change their internal forces and control influential external forces. Although the absolute majority of the organizations have realized the vital role of rapid response to unstable market conditions, they have failed in their efforts to design their own new structure. Each company should be designed as an agile organization in order to respond to the internal and external changeable conditions. Virtual organization is a perfect sample of agile organizations which are forming today at a rapid rate and could be a reasonable reaction to this novel necessity (Tseng & Lin, 2011).

Goldman et al. (1995) claimed that an agile organization has the capability to be successful in a competitive environment with continuous and unforeseen fluctuations. This explanation could be stated briefly as "an enterprise's ability to prosper in an unsettled circumstance". This short description is based on Emery and Trist's (1965) investigation of a turbulent market, in which the environment considered at a high level of ambiguity conditions. Companies who are able to respond and react to unpredictable and changeable marketplace permanently fulfill customers demand and gain enterprise's goals are considered to be agile. While there are lots of definitions of agility in the literature, the main description is "the manufacturer's capability to quickly respond to market requirements" (Yauch, 2011).

Due to the necessity and importance of agility capabilities in manufacturing firms, this study addressed this issue and answers the following questions:

1. What are the components of agility capabilities?
2. What are the impacts of these components on manufacturing firm's performance?

Finally, according to the investigation results, some potential practical solutions have been proposed to develop agility capabilities in the organization more effectively.

2. The literature on organizational Agility

Agility is the ability to succeed in the changing and unpredictable environment. As organizational agility is a novel conception, it does not have a very precise definition in the business literature and there are some ambiguities in its concept. For example, Goldman et al (1995) claims it as "the new fundamental and unique way to manage the business". It is also interpreted as a strategic intent which the organization hopes to establish a long-term competitive position (Hamel & Prahalad, 1994). Quickness, flexibility, competence, responsiveness power and human-resource management are the main dimensions of agility (Vazquez-Bustelo & Avella, 2006). In order to organization works quickly and flexibly, it is necessary to have modern technologies and up-to-date information systems. Investment in knowledgeable workers, business process integration, coordination with virtual forms of organization, internal and external collaboration and achieve integrated distribution chain are also other necessities to enhance organizational agility.

Agility is the organizational ability and flexibility which can be regarded as the reactions to the environmental fluctuations and variations. Based on this definition, agility addresses the need of nonstop improvement and also it could be claimed that today's standards are tomorrows' old method. Therefore, enhancement is always a necessity. Agility could be considered as a combination of the processes, characteristics and employees of an advanced technology organization. Agility enhances the organization's capability to provide high quality products and services and therefore it is crucial to increase the organizational competitiveness by enhancing the employees' knowledge and experiences which enable organization to gain desired results (Hamel & Prahalad, 1994).

Various scholars have proposed different definitions of Agility from diverse perspectives. Some of the main concepts of these definitions are as follows (Vazquez-Bustelo & Avella, 2006):

- Mobilize the basic functionality of the organization.
- Respond to the social and environmental issues.
- Combine various technologies.
- React to changes and uncertainty.
- Organizational coherence within and between the organizations.

2.1 Agility Capabilities

Agility capabilities are the organizational characteristics which should be created in order to develop the ability of the organization to respond to the changeable situations rapidly. These features include: flexibility, quickness, responsiveness, and competency.

- Flexibility: Include the ability to produce and provide various products and attain different objectives with the same equipment and resources. Flexibility consists of four areas as follows (Kanet et al., 1999; Arif Khan & Pillania, 2008):
  - ❖Flexibility in product volume
  - ❖Flexibility in product variety
  - ❖Flexibility of the organization
  - ❖Flexibility of the individuals
- Quickness: Ability to perform the operations quickly which includes:
  - ❖Quickness in Introducing new products to the market
  - ❖Quick and on-time product delivery
  - ❖Quickness in operation time
  - ❖Quickness in produce prototype
  - ❖Centralize making the product
  - ❖Quickness in R&D department operations
- Responsiveness: The ability to recognize and respond to rapid changes. Which consists of:
  - ❖Feel, understand and predict changes

- ❖Immediate and rapid response to change
- ❖Creating, modifying and improving the change
- ❖Product updates
- ❖Customer feedback

- Competency: encompasses a wide range of abilities, the productivity of activities provided in order to achieve organizational goals. These factors include the following:
  - ❖A strategic perspective
  - ❖Appropriate software and hardware technologies
  - ❖Product quality
  - ❖Cost effectiveness
  - ❖High level of new product introductions
  - ❖Change management
  - ❖Knowledge ability and competence of individuals
  - ❖Effectiveness and efficiency of operations
  - ❖Internal and external coordination
  - ❖Integration

2.2 Agility Models

Several models have been proposed for the agility. Given the importance of three models among others, namely Sharifi and Zhang (1999), Sharp et al. (1999) and Crocitto and Youssef (2003), they are discussed below:

2.2.1 Sharif and Zhang model

This conceptual model is proposed to establish agility in manufacturing companies and consists of three phases (Figure 1) (Sharifi & Zhang, 1999):

1. Agility drivers, which include the business environment variations and pressures that oblige company to search for new ways of business in order to keep its competitive advantages.
2. Agility capabilities, which consist of fundamental abilities that the company required to respond to the changes appropriately and gain competitive advantages in the business environment.
3. Agility providers, which involve tools and equipment that agility capability can obtained by them. These tools categorized into four dimensions: organization, individuals, innovation and technology.

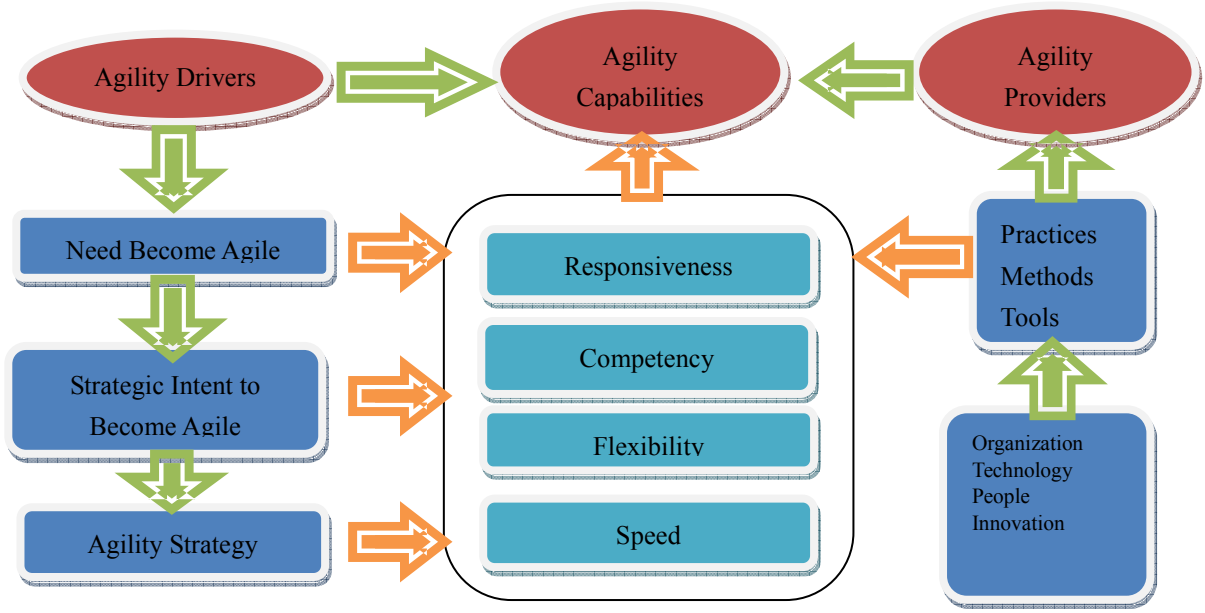

Figure 1. Conceptual model of agility (Sharifi & Zhang, 1999)

2.2.2 Sharp et al. Model

This model provides a theoretical framework for agile manufacturing and has three components (Figure 2) (Sharp et al., 1999):

1. Models foundation
2. Models enablers
3. Models outputs

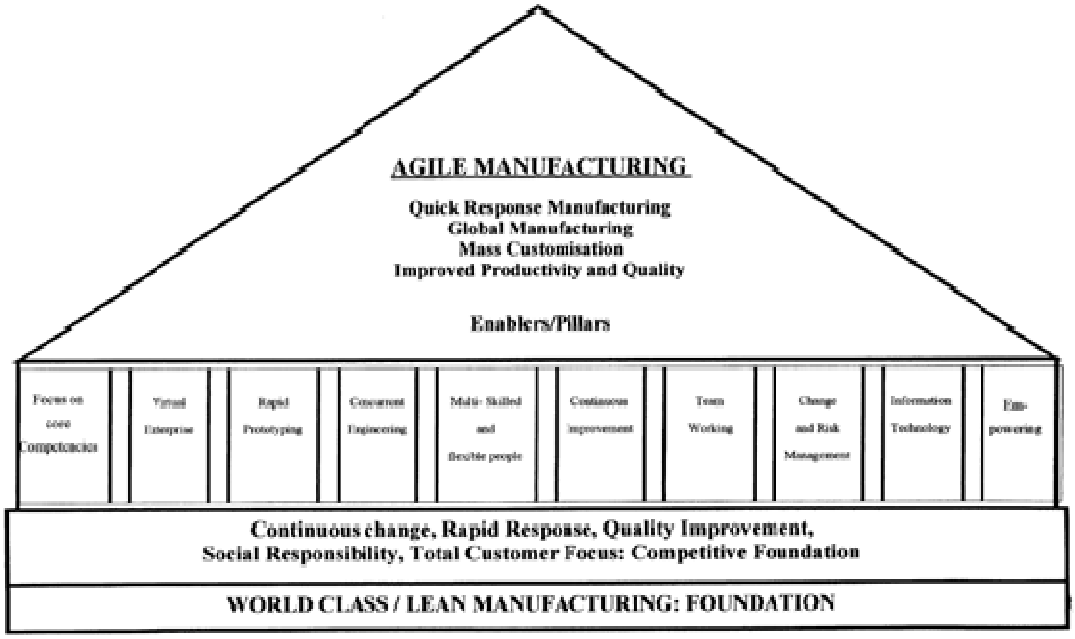

Figure 2. Theoretical model for agile manufacturing (Sharp et al., 1999)

2.2.3 Crocitto and Youssef Model

In one model of organizational agility which presented by Crocitto and Youssef (2003), advanced technology of information and production leads to the creation of production agility which in turn brings about the creation of organizational agility by reducing costs and increasing quickness and quality. According to this model, created responsiveness and flexibility have a close association with the agility. Besides, it is important that leadership as a part of organization support employees to build the relationship with their suppliers and customers. In addition, those managers that are able to access the advanced information and manufacturing technologies, should be aware of the effects and influences of their utilization in the organization. This can eventually engender the acceptance of necessary changes and the application of essential employee training in manager plans. The strategic leadership can make efficient use of organizational culture in order to achieve a competitive advantage (Figure 3).

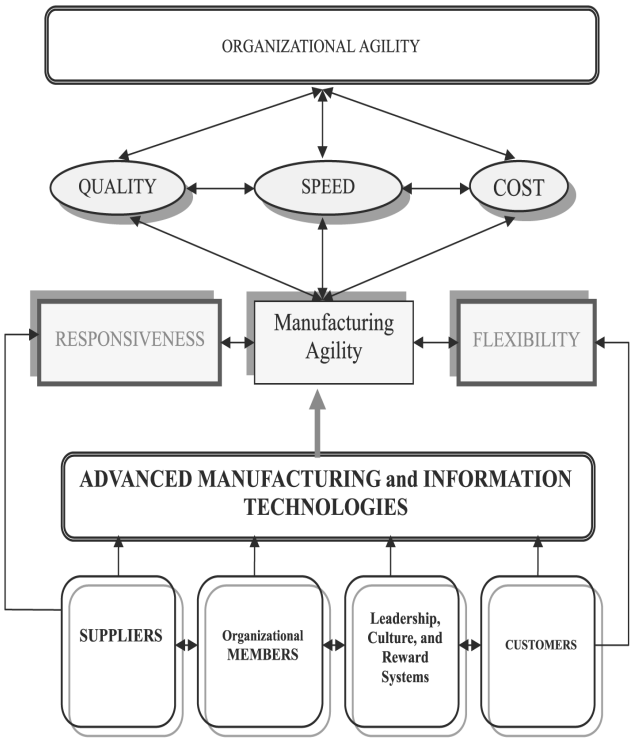

Figure 3. Model of organizational agility

(Crocitto and Youssef, 2003)

Furthermore, management should be able to prepare their employees, who deal with different types of customers, and this can be accomplished by technical and personal training. The organization's reward systems should support staffs endeavors in order to improve continuously. Organizational culture and reward systems leadership can support organization's members to interact with customers and suppliers more efficiently and effectively (Crocitto and Youssef, 2003; Harper and Utley, 2001).

2.3 Virtual organization, an agile organization

Accomplishing agility is a dynamic and continuous process, and political, economic and social stimuli cause increasing' impact on the level of agility which an organization required. Some of the reasons for establishing an agile structure (virtual) in the organization are as follows (Gunasekaran, 1999):

- Lack of all the capabilities required for an independent organization to offering a new product to market quickly.
- Short-term market opportunities.
- Unpredictable nature of ongoing changes in the market, while by creating a virtual organization, the risk is distributed among the partners and their individual vulnerability will decrease.
- The main idea of establishing a virtual organization is based on the utilization of instant and short-term market opportunities, through the integration of the core capabilities of independent companies.

2.4 Organizational Performance

Evaluation of business performance is one of the main management agendas, because performance measurement is the key element to improve organizational performance. In addition, they are criticized for some reasons such as encouragement of short-term perspectives, lack of strategic focus, inability to provide quality data, low level of responsiveness and flexibility, optimistic view encouragement, failure to provide information about what customers require and competitors' performance assessment (Yauch, 2011).

Performance evaluation is a systematic attempt to understand to what extent governmental services meet the people's

requirements (halachmi, 1999). Some individuals have considered it as the process of evaluation and performance measurement system in the union's executive within the principles and concepts of scientific management and organizational tasks for achieving the goals and action plans (Higoft, 2000). Organizational performance refers to the state of gaining missions, tasks, organizational activities and the results obtaining from them. Evaluation is the complex process of assessment, valuation and the judgment on performance. In one dimension, performance evaluation is expressed as the using of resources and facilities in the form of performance indicators. Put simply, efficiency is considered as the proportion of output and input, actually performance evaluation system assesses the effectiveness of management decisions in the optimal use of resources and facilities. Performance evaluation in the organization is usually synonymous with the activities' effectiveness. The purpose of effectiveness is the proportion of achieving objectives and plans enhancement by the characteristic of the efficient activities and operations (Gong and Janssen, 2012).

2.5 The impact of agility capabilities on organizational performance

In the agility concept, for measuring the responsiveness value, it is necessary to investigate organizational structure from the financial aspect in order to realize, understand and predict organizational variations. It could be achieved by implementing responsiveness measurement in the organization and assessing the rate of return on investment, organization financial efficiency, profit margin and sales volume of products (Tseng and Lin, 2011).

If the organization could be evaluated from the perspective of learning and innovation which includes employee satisfaction and productivity, human- resource management and some dimensions of organizational competence) could be attained. To obtain flexibility, organizations' agility sector can employ the new products' evaluation and development, discovered errors, production cycle-time improvement; production capability development and the rate of reworking. Assessing this part of the organization would facilitate flexibility expansion in the organization and also makes it possible to be flexible in production and volume of the product. For making workforces flexible, learning assessment and innovation could be helpful as well. Agility sector of the organization concentrates mainly on the product design and production processes. The organization should be evaluated from the customer satisfaction and financial aspects in order to accomplish required organizational quickness. Therefore, the organization could benefit from customers to achieve a more desirable product (Tseng and Lin, 2011).

As the result, to achieve organizational agility, organization should be carefully investigated and analyzed from diverse perspectives. In this regard, this paper will focus on the methods which increase organizational efficiency, the proportion of input to output, and also assists the organization to continuously improve and produce desirable products. According to the multiplicity of approaches, this paper will investigate agility capabilities with the four components namely responsiveness, flexibility, quickness and competency and its relation to financial and non-financial performance in two dimensions.

3. Conceptual framework

The conceptual framework is constituted by the combination of two broad variables; the independent variable is agility capabilities, which including responsiveness, flexibility, competency and quickness dimensions. Also on the other hand, the dependent variable is organizational performance which measured by eight indicators encompass sales in comparison to competitors, organization market share, customers' attraction, customers increase, customer retention, new-product offering to the market, the rate of return on investment and net profit. Agility capabilities have chosen based on the perspective of Vazquez – Bustelo and Avella (2006). Also, Performance indicators have been adopted following the perspective of Kong and Thomson (2009). According to these two models, the research conceptual framework has been developed (Figure 4).

Main hypothesis:

- **H-1**: There is a positive and significant relationship between agility capabilities and corporate performance in manufacturing firms.

Sub-hypothesis:

- **H-2**: There is a positive and significant relationship between responsiveness and corporate performance in manufacturing firms.
- **H-3**: There is a positive and significant relationship between flexibility and corporate performance in manufacturing firms.

- **H-4**: There is a positive and significant relationship between competency and corporate performance in manufacturing firms.
- **H-5**: There is a positive and significant relationship between the quickness of services and corporate performance in manufacturing firms.

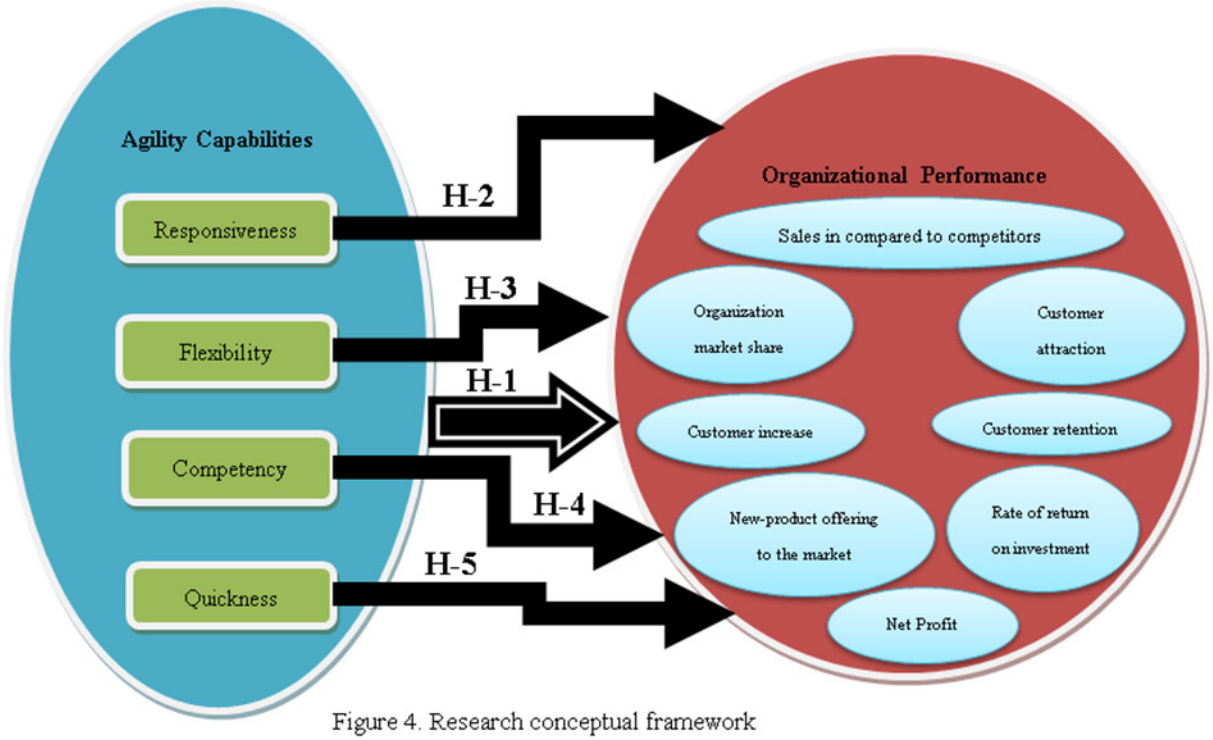

Figure 4. Research conceptual framework

4. Methodology

The aim of this study is to investigate organizational agility from a practical perspective and also the nature and method of the study are descriptive survey. The study population consisted of employees of manufacturing companies which include 11 home appliances in IRAN, Khorasan-E Razavi province. According to the feature and the nature of this study, the statistical population of employees was selected from undergraduate level or top diploma managers. Furthermore, the number of people who participated in this study was 160 people that 131 of them were answered the questions and these numbers of individuals were selected for analysis. After defining the parameters of each variable, the questionnaire was designed. The questionnaire was designed based upon two dimensions, which the first one is the independent variable (the agility) and 39 questions were measured agility dimensions. The second axis of the questionnaire determines the dependent variable, which is termed company performance (financial and non-financial indicators) and for these indicators nine questions were raised. Accordingly, the questionnaire included 48 questions along with seven demographic questions with a total of 55 questions on the questionnaire forms. The questionnaire design framework was based on two different resources; the first relied on the existing literature and measurement and the second one derived from consultation with scientific experts and specialists in management and economic sectors. Cronbach's alpha coefficient is used to determine the validity of the questionnaire. For data analysis, according to the subject, purpose and research hypotheses, descriptive statistics (frequencies, percentages, etc.) and inferential statistics (Spearman correlation coefficient) were applied. This factor was used to analyze hypotheses in order to reject or confirm them. The reason for using Spearman correlation coefficient is to have data as a ranking and also set the size of variables as a ranking (Christmann and Van Aelst, 2006; Frapporti et al., 1991).

4.1 Questionnaire validity and reliability

The Cronbach's alpha coefficient was used to determine the reliability of the questionnaire. This factor for the agility questions was 0.814 and for performance questions was 0.759, and the total Cronbach's alpha coefficient for the questionnaire was 0.787. Questions were validated based on validity of content and through expert judgment. In this regard, existing and validated measurements used in the existing literature were utilized in order to fulfill the requirements of content validity. Besides, the questionnaire was reviewed and amended by several academics to ensure the existence of content validity. It is helpful to ensure its validity by applying simple concepts and sentences and also multiple review questions by experts.

5. Analysis results

Descriptive statistics analysis:

The results indicated that a respondent in the age distribution of the 131 respondents constituted by 1.6 percent is in the age range of 20 to 25, 29.8 percent in the range of 26 to 30, which includes the greatest number. 27.5 percent in the range of 31 to 35, 13.7 percent in the range of 36 to 40 and 14.5 percent is above 41. From 131 persons of respondents, 77.9 percent (102 persons) were men, and 17.6 percent (23 persons) were women. In this population, 58 percent (76 persons) were married, and 29.8 percent (39 persons) were single and 9.9 percent did not reply.

With regard to the educational level of respondents, the results demonstrated that 58 percent were bachelors, 9.9 percent diplomas, 11.5 percent of advanced diploma and 9.9 percent were graduate respectively. The results obtained in workforce experience showed that 26 percent of respondents have 1 to 5 years' experience, 45.8 percent 6 to 10 years, 13 percent 11 to 15 years, 1.6 percent 16 to 20 years and 8.4 percent are over 21 years' experience. 4.6 percent did not provide any answer to this question.

5.1 Data analysis based on the Spearman correlation test

The Spearman correlation test was used to test the research hypotheses. Results in each of the components and the indicators are shown in Table 1. Sub-hypotheses include the relationship between responsiveness, flexibility; competency and quickness were investigated with company performance. The analysis revealed a significant positive relationship exists between these variables, and the relationship approved in the confidence level of 0.99.

The correlation coefficient between agility capabilities' variables and company performance were as follows: Response factor of 0.481, flexibility factor of 0.468, competence factor of 0.416 and the quickness factor of 0.570 were correlated with firm performance. In total, there was a positive and significant relationship between agility capabilities and company performance by a factor of 0.62 in confidence level of 0.99 percent.

Table 1. Spearman correlation coefficients test between agility capabilities' variables and firm performance

Indicators	Responsiveness	Flexibility	Competency	Quickness	Agility Capabilities	Company performance
Responsiveness	1					
Flexibility	0.593	1				
Competency	0.465	0.511	1			
Quickness	0.533	0.588	0.617	1		
Agility Capabilities	0.774	0.775	0.746	0.816	1	
Company Performance	0.481	0.468	0.416	0.570	0.620	1

The results of data analysis agility capabilities' variables and performance indicators include: 1) sales in comparison to competitors, 2) company market share, 3) customer attraction, 4) customers increase, 5) customer retention, 6) new product offering to market, 7) return on investment (ROI) and 8) net profit. The correlation coefficient between agility capabilities' variables and the company performance are as follows: agility capabilities in sales compared to competitors with a factor of 0.473, company market share in the ratio of 0.448, the customer attraction with the factor of 0.503, customer increase rates 0.510, customer retention factor of 0.441, to offer new products to market by

a factor of 0.580, ROI factor of 0.439 and net profit by a factor of 0.439 were positive and significant correlation (Table 2).

Table 2: Spearman correlation coefficients test between agility capabilities' variables and firm performance

Indicators	1	2	3	4	5	6	7	8	9
Sales compared to competitors	1								
Company market share	0.628	1							
Customer attraction	0.539	0.628	1						
Customer increase	0.465	0.596	0.820	1					
Customer retention	0.460	0.612	0.660	0.693	1				
New product to market	0.429	0.429	0.503	0.522	0.503	1			
ROI	0.463	0.411	0.446	0.402	0.540	0.433	1		
Net profit	0.395	0.391	0.377	0.412	0.460	0.472	0.698	1	
Company performance	0.579	0.635	0.676	0.679	0.698	0.609	0.660	0.663	1
Agility capabilities	0.473	0.448	0.503	0.510	0.441	0.580	0.439	0.533	0.620

6. Conclusion and discussion

The Spearman correlation test was used to test the research hypotheses. Results in agility capabilities and company performance (main hypothesis) showed that there is a positive and significant relationship between dependent and independent variables by a factor of 0.620 in the confidence level of 0.99 and thus the main hypothesis was confirmed. In addition, the results obtained from the components of agility capabilities and company performance (sub-hypotheses) indicated that there is a significant and positive relationship between responsiveness and corporate performance by the factor of 0.481, flexibility and firm performance by a factor of 0.468, flexibility and company performance by a factor of 0.416 and between company performance and quickness by the factor of 0.570, in the confidence level of 99 percent. The results regarding the relationship between the agility capabilities and company performance indicators exposed that there is a positive and significant relationship between these capabilities and sales compared to competitors, a factor of 0.473, company market share in the ratio 0.448, customer attraction with 0.503, customer increase by a factor of 0.510, customer retention by a factor of 0.441, to offer new products to market by a factor of 0.580, ROI factor of 0.439 and agility capabilities and a net profit factor of 0.533 in confidence level of 99 percent. According to the results, the following suggestions for improving enterprise agility and increasing performance capabilities of the company are presented:

Positive and significant relationship between responsiveness, flexibility, competency and quickness in company shows that these components provide the preliminaries for increase company performance. Quickness in providing services, responsiveness, flexibility and competency has the greatest impact on performance respectively. Therefore, considering these components is crucial to create agility in the companies, which in turn leads to company's success. Hence, it is suggested that managers should apply these capabilities in their plans. On the other hand, if agility capabilities are designed and implemented well, the company would achieve improvement in the following performance indicators: offering a new product to market, increase customers, customers' attraction, and sales in comparison to competitors, customer retention, company market share, rate of investment and net profit. Moreover, attention should be devoted to the eight performance indicators in terms of the magnitude of their effect on managerial decision-making in order to improve the company's conditions.

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