

Impact of Innovation Variables on Quality of Pharmaceutical Products Packaging

Solmaz Sadat Naghavi Alhosseini
Payame Noor University, Tehran
solmaz.naghavi@yahoo.com

Habibollah Danai
Payame Noor University, Tehran
h.danai@live.com

Mehdi Nassaji Kamrani
Payame Noor University, Tehran
mnkamrani@yahoo.com

ABSTRACT

Emergence of new demands in consumers due to changes in consumption habits and patterns and also increased awareness of health issues among consumers can pose the need to provide new and innovative packaging. Innovation in packaging, in addition to product introduction, has been the main factor to differentiate product from competitors' offerings, and has played an important role in marketing, whilst is considered as the main selling factor. On the other hand, given the economic conditions today, quality is a crucial component in the packaging and appears to be a prerequisite for entering the labor market.

This study aimed to evaluate the impact of innovation variables on packaging quality of pharmaceutical products. The study is a cross-sectional one, and the statistical population includes directors, managers and experts working in pharmaceutical companies in capital city of Tehran. The sample size of 150 was determined on the basis of Cochran's formula. The data gathering tool was a researcher-made questionnaire analyzed using one-sample t-test. Moreover, the Friedman tests with the help of SPSS software were used to prioritize each of the variables. The results showed that the focus on customer needs, market orientation, learning capability of the organization, as well as technological capacities of the organization, managers' and employees' tendency to abandon the existing knowledge, concentration on core competencies of the organization, lack of investment on previous technologies and strategic relation of the organization with customers and suppliers have a positive impact on the quality of pharmaceutical products packaging. As it stands, focus on customer needs and concentration on core competencies of the organization are ranked as the most effective variables influencing the quality of packaging and the variable of learning capability of the organization is ranked as the least effective one.

Key Words: *Packaging of pharmaceutical products, packaging quality, Innovation, packaging, Innovation in packaging*

INTRODUCTION

Innovation is the lifepower of the pharmaceutical industry, [1] and is the main driving force in the growth of the global pharmaceutical packaging industry [2]. The pharmaceutical industry is recognized as one of the most important and biggest industries in the world and has always been considered as a source of interest to economists and policy makers [3].

Increasing prevalence of chronic diseases, lifestyle changes, aging population growth, increasing incomes in developing countries, and biotechnology advances have led to the development of pharmaceutical industries. These trends have made the strategic importance of pharmaceutical and health care packaging more evident [4].

Drugs require extra care in packaging compared to other products; this is mainly because packaging defects can create problems that may result in the changing nature of drugs, which can lead to untreated illness or even death in patients [5].

Recognizing the importance of packaging in pharmaceutical industry and according to the focus towards innovation as a tool for competitive advantage, this research therefore aims to evaluate the variables of innovation and their impact on the quality of the packaging pharmaceutical products. This paves the way to determine innovative factors influencing the quality of packaging and improves the quality of pharmaceutical packaging industry.

For this reason, the author has initially provided an overview of the theoretical background of research in the fields of pharmaceutical products packaging, packaging quality and innovation in packaging.

LITERATURE REVIEW

1) Packaging of Pharmaceutical Products

During the last decade, packaging was considered as a secondary priority for many pharmaceutical companies, and was thought as only as the last step in the process of production. However, recently companies consider the packaging of pharmaceutical products prior to product development process [6] and pharmaceutical packaging has undergone a great deal of change. This can be attributed to the production of sensitive pharmaceutical products, development of new diagnostic agents, and stringent government requirements, as well as the growth of the middle classes and the organized retail sector worldwide [7]. Packaging of pharmaceutical products has a broad, comprehensive, and multidimensional nature, [8] and is an important tool for product delivery and demonstrates compliance with the regulations of pharmaceutical industry [9].

As Hayes (2010) says, "Packaging should carry information about the product; mean while it should protect the product and preserve its quality in the entire distribution chain". However, considering a pharmaceutical perspective, the main application of packaging is to deliver a qualified product to the consumer in a protected mode [10].

One of the most common definitions of pharmaceutical packaging is a cost-effective tool which provides a pharmaceutical product with protection, presentation, identification, and notification, as well as ease of use for the consumer from production to consumption [5].

Various forms of pharmaceutical products need different types of packaging. Three types of packaging may be considered for drugs. Primary package only covers the product. Secondary

packaging plays an intermediary role. Tertiary or outer packaging, which includes labels, cartons and containers [9].

According to Pilchik (2000) pharmaceutical packaging is considered as an essential part of the drug delivery systems and is distinguished as a key marketing mix element through which manufacturers can differentiate their products from their competitors' [11]. Drug packaging is regarded as effective and useful in the development of the market and customers satisfaction all over the world [12]. Magnusson (2012) believes that, the most effective way to satisfy the consumers is to involve them in the real process of packaging, which may lead to various ideas of packaging and enhance the possibility of relationship that consumers may develop with packaging [13].

2) Packaging Quality

Quality is a crucial factor of packaging at the same time as a principal tool of quality measurement [14]. Quality of product and quality of packaging are the main elements of purchasing decisions. When consumers notice new forms of packaging, they do a qualitative assessment based on the characteristics of the packaging [15].

The term quality in fact, refers to various items such as degree of excellence, compliance with standards, specifications, special characteristics and features. Since the concept of quality is rather a matter of values, therefore it is multidimensional in nature and different interpretations can be explained [16].

Quality of packaging can assure maintaining integrity of pharmaceuticals during storage, conveyance, and delivery [17]. Pharmaceutical firms have broadened their quality approach toward good manufacturing practice to ensure quality and safety of products. In order to assess the effectiveness of pharmaceutical firm's quality control and quality assurance systems, validation

and auditing are considered as supporting processes [18].

In the past, the quality of products or services was thought as a property of an organization, but in today's economic situation, quality is a prerequisite for entering into the market [19]. Three factors should be explored in terms of quality: Manufacturer, Supplier and Consumer as the last but not the least link in the chain [14]. Shurufat (2005) showed that there is a meaningful association between the qualities of the cosmetic product packaging and marketing effectiveness in the Jordanian market, consequently, when buying, consumer decisions are influenced by packaging [20].

Granrt and et al (2000) have claimed that when consumers see a new package on a store shelf, they normally have to evaluate product quality by examining the package [21].

Results of Fathi Abdollah & et al (2011) showed that for consumers, there exist a high level of awareness between the quality of packaging design and symbolic dimensions of packaging with company advancement and higher demand for food products among senior managers of food firms in Jordan [20].

In another study carried out by Bahraini (2013) the effect of food products packaging on consumer behavior was investigated. The results showed that, all respondents 100% confirmed the effectiveness of product packaging quality on consumer behaviors [22]. The results of Gilaninia study (2013) showed that the variables of design, colors, packaging materials, labeling and information providing, are indicators that have a direct impact on quality of packaging of export saffron [14].

3) Innovation and Factors Affecting It

Firms engaged in developing innovative products and services have been found to compete more profitably through the development of new products and processes, before competitors in first-mover advantage, growing market share, return on investment, and overall firm accomplishments [23].

Innovative companies are realized to be able to respond to environmental challenges faster and better compared to the non-innovative ones. Therefore, organizations have been lead to consider innovation as a central part of their corporate strategy, and to offer products that are well adapted to the needs of target customers in order to create a sustainable competitive advantage and to survive in the competitive markets [24].

The pharmaceutical industry is marked as interacting in an increasingly dynamic and complex environment [18]. The concept of Innovation has received special attention as a means to create competitive advantages in this industry. A survey performed by McKinsey showed that innovation is thought as one of the three growth factors of the company by more than 70 percent of senior managers in the next three to five years [25]. According to Schumpeter (1987) innovation is practicing new forms of production methods, and includes the introduction of new products and new methods of production, as well as creating new markets and new sources of raw materials and semi-manufactured products [26].

Jimenez (2011) believes that some effective factors in innovation include: individual and organizational learning, organizational knowledge, market opportunities, sharing of knowledge and information of employees, size and history of the company, cultural values, different equipment, the change in the number of employees, improving technological skills of staff [27].

Yeung (2007) in his research highlighted the impact of organizational learning on innovation

[28]. Clegg (2003) described innovation with regard to the role of stakeholders; they showed that in the past, the environment was considered as the source of innovation and changes, but now the roles of stakeholders; especially customers are more evident [29]. Makri (2010) has noted for the role of science, technology, creative and operational leadership, market share and market diversification on innovation [30].

Drucker (2002) has introduced the main sources of innovation as unexpected events, adverse conditions, process requirements, changes in industry and market, demographic changes, changes in perception and new knowledge [31].

Hayes & Finnegan (2005) proposed factors resulting in innovation as development of information technology tools, lack of centralization and flexibility in duties, highly competitive prices and market shares [32]. Gatignon and Robertson (1993) claimed that competitive factors play a decisive role in the development and implementation of innovative strategies [33].

Spender and Grant (1996) have proposed knowledge as the real driver of the innovation and competitiveness of the organization [34].

Hermann & et al (2006) introduced internal factors influencing innovation as the following: focus on customer needs, market orientation, learning capability of the organization, technological capacities of the organization, managers and employees tendency to abandon the existing knowledge, concentration on core competencies of the organization, lack of investment on previous technologies, strategic relation of the organization with customers and suppliers [35].

Micheels & Gow (2008) found that market-oriented firms are more innovative and may show better performance. They also found that to achieve a better performance and efficiency firms should consider both internal and external markets [36]. Research carried out by Augusto & Coelho (2009)

showed that customer orientation, competitor orientation and coordination among tasks and activities are valuable forces in the field of innovation for new products [37].

In a study by Suliyanto (2012), collected data showed that innovation has a significant impact on business performance and reinforces market orientation, learning and innovation. They also stated that to improve business performance in small and medium enterprises, market orientation should be usually enforced by collecting customer and competitor information and coordination among different units [38]. Investigating models affecting innovation, Jafarnejad has referred to internal and external variables that directly or indirectly affect the innovation process. He introduced external variables as the economic environment, supply and market factors, details of industry structure as well as government policies, and named the factors of enterprise systems as internal variables [39].

4) Innovation and Packaging

As Rundh (2005) says, innovation in packaging is a key strategy for competitive success and survival in the global market. Meanwhile, the emergence of new demands from clients due to changes in consumption patterns and habits has resulted in higher demand for new and innovative packaging solutions; consequently innovative packaging can change the perception of the product and create a new market position [40]. In fact, if consistent with the needs of the consumer, innovative packaging can add value to the product [41].

Magnusson claims that to improve the packaging innovation, there are a need for increased integration of product, packaging development, as well as cooperation on supplement channel. Moreover, packaging firms should consider innovation as one of their top priorities [13].

Innovations, new technologies of packaging, and the customer's feeling of satisfaction regarding

packaging are very important in the future of packaging [42]. In most firms around the world, a variety of technologies are used to provide innovative packaging to adapt more to the market needs [43]. The Applying technology provides the packaging according to trends and consumers' attitudes and behaviors. The role of technology is to meet consumers' needs and requirements. As far as technology is a communication element, it should be presented visually and, therefore, it will allocate more attention and will be convenient for consumers [15]. Esmaeilpour (2009) stated that packages with newer technologies are highly selected by consumers [44].

With recent advancement in technology, pharmaceutical packaging firms have come to be known as one of the leading innovators within industry [17]. Patel Chirag (2012) suggested that Pharmaceutical packaging technology is aimed at meeting demands of global market, and evaluate a wide range of current knowledge, catering for the requirements of the pharmaceutical industry as well as for pharmaceutical companies in emerging nations who are still in search of a basic grounding in this field [45].

Although some packages impose relatively high costs on the manufacturer [46], but considering their role in improving product quality and services, increasing shelf life and reducing complaints and answering the needs of customers, this price difference not only can be offset, but a good packaging can also increase the possibility of purchasing a particular product by the customer [47]. Without innovation, even the most beautiful packaging will lose its attraction very soon. All efforts done for innovation in packaging are aimed at providing a new and convenient packaging to make the products more prominent and to have more application for clients [42].

Eilert (2005) said that the cost of materials is an essential element of innovation in packaging

[48]. Butkeviciene (2008) divided characteristics and attributes of packaging into two categories including: verbal elements (brand name, product name, production-location or country of origin, information, education and special offers) and non-verbal elements (images, graphics, color, shape, size and materials) that may influence the consumer decision making process [49].

The results of Stewart (2004) study indicated that consumers are key factors in the planning and use of the packaging, and consumer understanding is a fundamental issue that must be considered when designing new packaging [50]. In the study conducted by the Association of Packaging (2006) the influence of variables such as consumer, environment, internationalization, and marketing effectiveness, as well as technology were introduced as some of the key drivers influencing innovation in the packaging industry [51].

In a survey by Silayoi & Speece (2004) the impact of packaging on consumers buying decisions was studied based on two variables, including: complexity level of purchase and the time pressure when purchasing food products. In this study, the packaging factors were classified into two categories of visual factors (i.e. size, shape and the color of packaging), and informational factors of packaging (i.e. information on the packaging and type of packaging such as technologies used in the packaging). They introduced packaging as one of the most important factors in selling products with high involvement potential and admitted that packaging of food and skin care medications (products with high involvement) has been effective to provide information to the customers and has encouraged them to buy the product [52].

In their research, Ampuero & Vila (2006) classified their data once based on designer's idea to determine key graphic variables in designing the packaging, and once more based on the idea of consumers to determine the relationship of each

package with strategy of that particular situation. The results showed that the buyers understanding from each dimension of visual packaging, alternative packaging color, packaging typography, as well as alternative packaging graphics and images can determine the specific position of the product, moreover to implement each product positioning strategies; visual dimensions compatible to each strategy should be used in product packaging [53].

Mehta Kunal (2012) in a study conducted on the recent trends in the packaging of pharmaceutical products, found that packaging plays an important role in maintaining the integrity of the product in many ways, such as providing protection, identification, information, control, convenience and compliance for the product during storage, transport, distribution until the product is consumed. They also examined various aspects of the packaging, such as the materials used for packaging, type of packing, as well as recent trends of packaging in the pharmaceutical market [2].

Another study conducted by Silayoi & Speece (2007), concluded that marketers and designers should consider desires, needs and experiences of consumers. Therefore, packaging and its design should be adapted to consumer preferences, needs, as well as their visual perception and satisfaction to result in the greatest impact. They also concluded that the technology used in packaging may influence consumer purchasing decisions [54].

Rundh (2009) in his study concluded that Packaging design is influenced by a complex set of business environment, and provides the possibility of introducing new and better solutions for marketing. Furthermore, among the main effects, some play a key role in management decisions of marketing strategies, including: new technologies, materials development, logistics requirements, environmental issues, consumer preferences, as well as various aspects of marketing and marketing strategy [55].

CONCEPTUAL MODEL OF RESEARCH

Based on the theoretical basis and references above, Hermann & et al (2006) was used to measure the parameters influencing the innovation model. They introduced eight factors as internal factors affecting innovation including: focus on customer needs, market orientation, learning capability of the organization, technological capacities of the organization, managers and employees tendency to abandon the existing knowledge, concentration on core competencies of the organization, lack of investment on previous technologies and strategic relation of the organization with customers and suppliers.

What is the focus of this study is to assess the impact of each of these factors and to determine the priority of each of them on the quality of pharmaceutical products packaging. Given as above, the proposed model is shown in Figure 1.

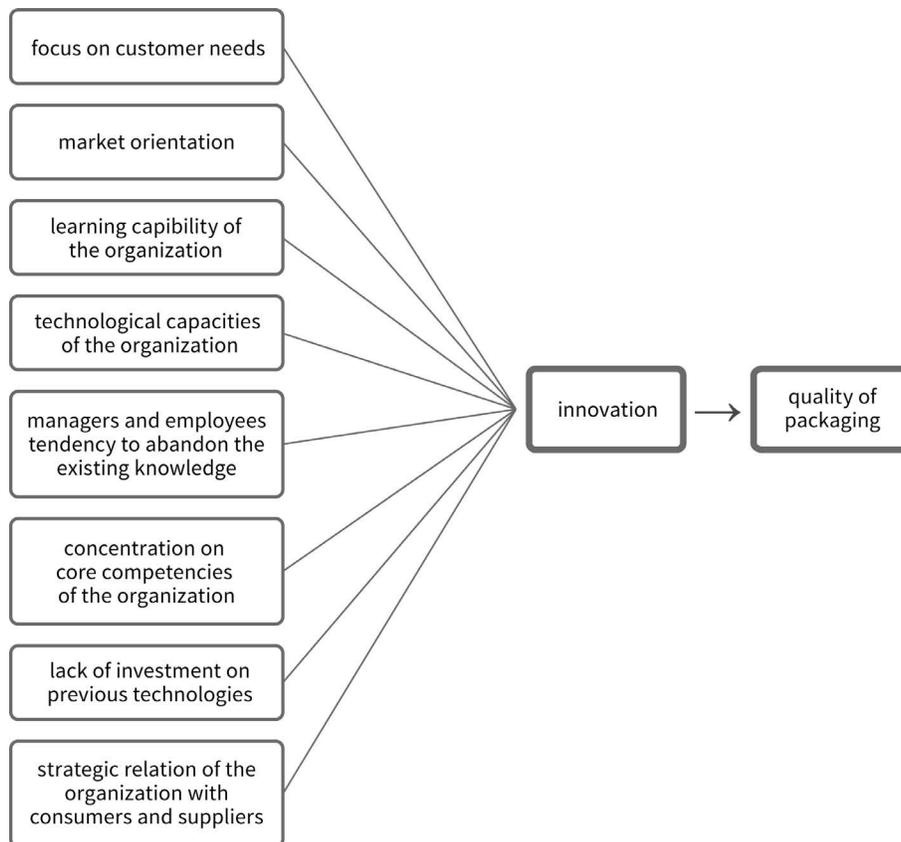


Figure 1: The Conceptual Model

RESEARCH HYPOTHESES

H1: Focus on customer's needs affect the quality of product packaging.

Consumers are recognized as having different needs, habits, benefits, subjective characteristics, information, and shopping preferences, all of which make consumerism difficult [56]. Marketing research has revealed that firms do well when they focus on their customers' needs [57].

Customer orientation'' is believed as a keyword in modern business era. The main idea behind it is that firms need to focus on the needs and wishes of past, current and future buyers. This may include offering friendly and instant services, devoting attention to complaints and providing information about products easily accessible. Homburg and Rudolph explain that such activities are imperative in customer satisfaction [58].

Customer complaints can be a valuable and low-priced source of information for recognizing systematic errors and contributes to customer-focused process improvement. Johnston (2001) have revealed that a well-handled customer complaint process confidently correlates with process improvements (Engineering route), customer satisfaction (Customer Orientation route), employee attitudes (Human Resource route) and, finally, company performance [59].

H2: market orientation affects the quality of product packaging.

Market orientation may be described as the organization wide generation of market intelligence, or information on customer needs, publication of that information across sections, and organization wide responsiveness to it. In principle, market orientation implies to the way that an organization implements the marketing meaning [60]. Kohli and Jaworski (1990) concluded that conceptual descriptions of the

marketing notion are of little practical value and that the improvement of definitions dealing with specific practical activities becomes essential [61]. Market-oriented firms have generally superior returns given to their greater market sensing, imitation and innovation skills [62]. In market-oriented firms, information on all key buying influences infiltration on all corporate function that makes internal well-coordinated, tactical and strategic decisions through commitment [63].

H3: Organizational learning affects the quality of product packaging.

Organizational learning is defined as a strategic variable that seek out new products or create new markets due the need for continuous innovation. Hence, it seems indispensable to inspire factors that contribute to innovation and make it possible to introduce new ideas, services, products, and systems sooner than other competitors in the industry [64].

H4: Technological capacities of the organization affect the quality of product packaging.

Technology is known as the main cause of changes to meet the current needs of customers, and providing variety facilitate quick entry into new markets, which in turn can be an opportunity for enterprises to gain competitive advantage over the competitors [67]. Combining technology with expert human resources has the advantage of early responding to changes in customer demands as well as to access and to develop new markets [68]. According to Betz technology is a mixture of knowledge, skills and technical capabilities that enables its holder to alter the natural world [69]. Technology has a significant role owed by its ability to innovate and also to serve as an important source of new product innovation and competitive advantage [65].

H5: Managers' and employees' tendency to abandon the existing knowledge affect the quality of product packaging.

Knowledge is thought as a critical element to achieve a higher level of competitiveness and innovation within the organizations. Firms acquiring more capabilities so that their employees attain and share the tacit knowledge will be capable of creating a greater level of innovation in their activities. This is feasible through benefiting the creation and development of new knowledge integrated in the innovation or changes in the products or services produced for the benefit of consumers [70].

It is imperative that companies attain knowledge from suppliers, employees and customers constantly to ensure continuous improvement in both product and service quality. Doing so provides the companies with the ability to understand the financial status of the firms, the skills and capabilities of their employees and customers' product preferences, which in turn assists firms to store up knowledge and at the same time to ensure that quality is met in every single aspect [71].

H6: Concentration on core competencies of the organization affects the quality of packaging.

The concept of core competence has been established to support more competent identification and deployment of an organization's strength. The assumption is that core competencies change more gradually over time rather than products and markets [72]. Core competence is associated with resource allocation, capabilities, knowledge, skills, and expertise accompanied by value chain. Three elements are needed including: skills, resources and processes and it is in conjunction with communication, involvement, and a profound commitment to working organizational boundaries [73]. Hamel and Prahalad (1990) described core competencies are reported as having three basic characteristics: providing access to a wide-ranging

of markets, significant contribution to the ultimate product benefits, and difficulty of imitation for the competitors [74].

H7: Lack of investment on previous technologies affects the quality of packaging.

Technology is a kind of practical knowledge that appears in the form of artifacts such as machinery, equipment, components, products and systems. Using new technologies improves the quality of goods and services, increases productivity, and reduces time to supply new products to market, and therefore meet human needs [75].

Modern technologies require not only new skills but also outdate old skills. This fact draw the attention to the need for continuing education both at the individual level and the organizational level is old [76]. More importantly, developing and exploiting of new products will be feasible through integrating new technologies, which in turn improves functionality of product and contributes to tangible business benefits [65].

H8: Strategic relation of the organization with customers and suppliers affects the quality of packaging.

Customers are key assets that can distinguish one organization from another. So, successful organizations attempt to corporate customer strategies, where they have considered customer satisfaction as the mission of the business [77]. A growing number of companies are adopting customer-focus strategies, programs, tools, and technology for managing effective and efficient customer relationships. They gradually perceive the need for in-depth and integrated customer knowledge to build partnering relationships with their customers. The rise of new channels and technologies has significantly altered companies' interactions with their customers, which as a result yield a greater degree of integration between

marketing, sales, and customer service functions within the organizations [78]. The other side highly recommended to organization to initially decide upon what is necessary for the development and stability of supplier relationships, prior to implementation of supplier relationship management and reaping of the resultant supply chain benefits. Relationships with suppliers, similar to those with all other organizational stakeholders, comprise and require the development of mutual trust. Prior to establishing a trust-based relationship, customers and suppliers must bond on the basis of parallel central values. Otherwise, the relationship will probably be interrupted [79].

RESEARCH METHODOLOGY

The study is considered as an applied and cross-sectional one which examines the impact of innovation on the quality of the packaging of pharmaceutical products. Sample population includes directors, managers and professionals working in pharmaceutical companies in Tehran. In order to calculate the sample size of the target population, the Cochran formula with an error level of 0.08 was used, which confirmed a sample size of 150 for our purpose. Therefore, 150 questionnaires were sent to pharmaceutical companies, among the same number of questionnaires returned, six questionnaires were excluded because they were recognized as incomplete and unusable and finally 144 questionnaires were used for statistical analysis.

A simple random sampling method was used in this study; so that a number of pharmaceutical companies were selected randomly among all pharmaceutical companies in Tehran. Through telephone conversations, companies that were willing to cooperate in the investigation were determined and those reluctant to distribute the questionnaires were excluded from our list. Finally, the questionnaire was sent to 20 pharmaceutical companies willing to cooperate in the study.

DATA AND MEASUREMENT INSTRUMENTS

The survey tool was a questionnaire which consisted of two parts: In the first part, the participants' demographic information such as age, sex, educational level, and employment status and work experience were extracted, and in the second part the key questions related to the variables of our study were yielded. The study design was developed based on relevant studies on the topics of innovation and packaging. The questionnaire consisted of 35 items which investigated innovation variables in the form of eight components.

The variable "focus on customer needs" (4 questions), included the following components: identifying and understanding the current and future needs of customers, customer satisfaction, responding to customer complaints and evaluation of customer satisfaction [80].

While the variable "market orientation" (9 questions) extracted information on components such as: selection of the appropriate target market, information disclosure of competitors within the units, considering changes in consumer preferences and priorities, reviewing consumers' opinions and to gain deeper insights into their opinions, information exchange concerning customer satisfaction, suitable designs and graphics [60], focus of top managers to the strengths and weaknesses of competitors, coordination among different units within the organization to meet customer needs [80] and developing data banks of consumers and market according to firm's visions [81].

Next variable was "learning capability of the organization" (6 questions) which posed questions in regards with the following components: supporting and encouraging staff who provide new and innovative ideas [82], employing new methods to improve work processes [83], commitment to the process of change in the company, effective strategic planning to enter into competitive markets, increasing the number of specialists within the company and developing a

training program for managers and employees [84].

The other variable “technological capacities of the organization” (4 questions) were investigated through components such as investing in research and development activities (R & D) [85], the ability of staff to use the technology in the organization [86], training the staff to use technology[87] and information systems to support the affairs [88].

In the rest of our data gathering process, the participants came up with variable “managers and employees tendency to abandon the existing knowledge” (3 questions), which included components in terms of receiving, integrating and sharing knowledge from outside the company, information seeking through direct interaction with customers and suppliers [89], as well as transformation and exploitation of existing knowledge [27].

Another variable described as “concentration on core competencies of the organization” (4 questions), assessed issues regarding the improvement and development of key and special skills of personnel, organizational resources (infrastructure) [90], staff and administrators familiarity with the firm’s core capabilities and also potential access to diverse and widespread markets [74].

The variable of “lack of investment on previous technologies” (3 questions), gathered data on the use of advanced machinery and equipment’s[91], upgrading technological skills of staff [69] alongside with assessing the technological needs of organization in different timeframes. [92].

Also, the variable of “strategic relation of the organization with customers and suppliers” (2 questions), posed questions regarding components such as the extent of presence of the directors and staff among the customers and suppliers and also the degree of local geographical presence of company surrounded by customers and suppliers [35].

The validity of this questionnaire was reviewed by faculties and some experts in this field through assessing the content validity, and the final questionnaire were developed after modification. Moreover, using Cronbach’s alpha, the reliability was calculated 0.84. The answers were given on a 6- item Likert scale (from 1 = totally disagree to and 6 = totally agree).

Analysis of the data involved both descriptive and inferential statistics and was carried out using software SPSS (version 17). Therefore, to investigate the normal and abnormal distribution of data, the Kolmogorov-Smirnov test (K-S) was used. Considering the fact that the amount of significance (Meaningful level) was larger than or equal to 0.05, so the claim of data normality was confirmed (Table1).

variables	KS	P
focus on customer needs	1.569	0.05
market orientation	0.745	0.636
Learning capability of the organization	1.002	0.268
technological capacities of the organization	1.436	0.056
managers and employees tendency to abandon the existing knowledge	1.205	0.109
concentration on core competencies of the organization	1.124	0.160
lack of investment on previous technologies	1.207	0.108
strategic relation of the organization with customers and suppliers	1.834	0.07

Table 1: Kolmogorov-Smirnov Test (KS)

To test the hypotheses, one-sample t-test with the Test Value of 3 and confidence intervals of 95% were used. The null hypothesis of test was $\mu \leq 3$, meaning that if the average score of the variable is greater than 3, it indicates a positive effect of the variable on the quality of product packaging.

In order to rank each variable, the Friedman test was used. Furthermore, answers provided to questions which were in form of code, were rated in a way that those ranked higher had a greater impact. It should be noted that in order to have an impact and to prioritize the variables, a meaningful level of less than 0.05 is compulsory. In other words; the null hypothesis of this test is the lack of prioritization of variables affecting the quality of the product packaging. Consequently, if the meaningful level is less than 0.05, the null hypothesis is rejected.

FINDINGS

Analyses of demographic factors are shown in the following table (Table 2)

Characteristics	Respondents' Category	frequency	percent
sex	female	78	54.1
	male	66	45.8
age	25-36 years	96	66.6
	45-36 years	37	25.6
	55-46 years	7	4.8
	More than 56	4	2.7
education	BS/BA	46	31.9
	MS/MA	34	23.6
	PhD	64	44.4
Employment status	Expert	96	66.6
	Head	30	20.8
	Manager	18	12.5
	Less than 5 years	37	25.6
Work Experience	5-10 years	70	48.6
	11-15 years	24	16.6
	More than 16 years	13	9.03

Table 2: The information concern to respondent's demography

variables	frequency	Mean	SD	SEM
focus on customer needs	144	4.214	0.589	0.666
market orientation	144	4.009	0.517	0.586
Learning capability of the organization	144	3.924	0.619	0.701
technological capacities of the organization	144	4.131	0.547	0.620
managers and employees tendency to abandon the existing knowledge	144	3.987	0.754	0.854
concentration on core competencies of the organization	144	4.128	0.559	0.633
lack of investment on previous technologies	144	4.008	0.649	0.734
strategic relation of the organization with customers and suppliers	144	3.967	0.830	0.940

Table 3: Descriptive statistics of variable

In the descriptive statistical analysis, the frequency, mean and standard deviation were calculated for each indicator in order to describe the data. The results of this analysis are presented in Table 3. According to the above table, the highest average is related to the variable of focus on customer needs (4.21) and the lowest one is for variables learning capability of the organization (3.92).

Statistic evaluation regarding the hypothesis of the study indicated a positive relationship between packaging quality of pharmaceutical products and eight variables discussed in this study as bellow: focus on customer needs, market orientation, Learning capability of the organization as well as technological capacities of the organization, managers and employees tendency to abandon the existing knowledge, concentration on core competencies of the organization, lack of investment on previous technologies, and strategic relation of the organization with customers and suppliers (table 4).

variables	t	P
focus on customer needs	18.213	0.000
market orientation	17.228	0.000
Learning capability of the organization	13.181	0.000
technological capacities of the organization	18.247	0.000
managers and employees tendency to abandon the existing knowledge	11.549	0.000
concentration on core competencies of the organization	17.812	0.000
lack of investment on previous technologies	13.7232	0.000
strategic relation of the organization with customers and suppliers	10.287	0.000

Table 4: Statistic evaluation of hypothesis

variables	Mean Ranking
focus on customer needs	5.40
concentration on core competencies of the organization	5.01
technological capacities of the organization	4.79
strategic relation of the organization with customers and suppliers	4.55
managers and employees tendency to abandon the existing knowledge	4.21
lack of investment on previous technologies	4.17
market orientation	4.11
Learning capability of the organization	3.75

Table 5: the comparison of the rate of variables

Friedman test results also showed that the eight variables listed in the survey do not have the same priority on the quality of product packaging, So the focus on customer needs and then focus on the core competencies of organization, ranked the highest and learning capabilities of organization ranked the lowest in terms of priority for respondents. This test was performed with SPSS software (Table 5)

DISCUSSION AND CONCLUSION

As mentioned, the purpose of this study was to evaluate the impact of innovation variables on the packaging quality of pharmaceutical products.

The results showed that “focus on customer needs” has a positive impact on quality of packaging and components of this variable (i.e. identifying and understanding the current and future needs of customers, customer satisfaction, responding to customer complaints and evaluation of customer satisfaction have equal impact priority on the packaging quality of products). Therefore, pharmaceutical companies need to pay considerable attention to customers, and by creating a system of continuous assessment and evaluation of customer satisfaction as well as proper accountability to customer complaints can improve the company’s performance in the field of packaging.

Stewart (2004) concluded that consumers are key factors in the planning and use of the packaging, and consumer perception is a deep-seated issue that must be taken into account while designing new packaging.

Manuel Morga (2015) revealed that those engaged in packaging design need to update their knowledge of consumer preferences to supply the product properly and improve the consumer satisfaction. Selling products aims to raise consumer satisfaction. Packaging is a tool that intensely affects consumer satisfaction. This is due to its role as a powerful marketing tool to communicate directly, handing over the message of the product and creating added value to the consumer.

The results of this study, confirmed the effect of “market orientation” on quality of product packaging. On the other hand, respondents highlighted their main priorities among the components of market orientation as follows: suitable designs and graphics, reviewing consumers’ opinions to gain deeper insights into their ideas, selecting suitable target markets, focus of top managers on the strengths and weaknesses of competitors, attention to the changes in preferences of consumers, and coordination among different units within the organization to meet customer needs, information exchange on consumers satisfaction in various units, developing data banks

consumers and market, information disclosure of competitors within the units. Therefore, it is highly recommended that pharmaceutical companies by changing the design of packaging and presentation of a variety of packaging can attract new customers and add to the number of existing customers, and the periodic surveys may reveal the priorities and preferences of consumers, and yield an outline of their selling behaviors. Design of packaging based on market studies and customer needs to provide suitable and attractive packaging prior to competitors to each particular group within the society. Hence, investigating competitors' activities may help firms to analysis their competitor's strengths and weaknesses, as well as their short-term and long-term capabilities, so that they can respond to their opponents' strategies.

Silayoi & Speece (2007) concluded that marketers and designers should consider desires, needs and experiences of consumers. Therefore, packaging and its design should be adapted to consumer preferences, needs, as well as their visual perception and satisfaction to result in the greatest impact.

Our investigation also revealed a positive impact of "learning capability of the organization" on the quality of the packaging. Among the components of this variable, effective strategic planning to enter into competitive markets, employing new methods to improve work processes, supporting and encouraging staff who provide new and innovative ideas, and developing a training program for managers and employees were ranked by participants as the highest in order of their importance. Therefore, pharmaceutical companies are advised delegates of less developed packaging industries should visit other countries strong in this field. And to organize exhibitions as a showcase of the latest innovations created by the packaging industry which can bring large benefits to them. Manufacturers and exporters participating in such exhibitions find the opportunity to identify important problem areas in

the field of packaging. In addition, they come up with new packaging ideas made in other countries to get ideas from them.

Proposals offered by members should be analyzed and be practiced into the system to encourage others to take part. Alternatively, managers of companies are highly recommended to increase their awareness of packaging and hold specialized training courses in this field in accordance with international standards This would results in improved skills and proficiencies.

Fathi Abdullah and colleagues (2011) showed that improving rehabilitation level of producing packaging can provide the companies with the progressive objectives of industrial companies with a high degree of professionalism; this can be realized by organizing professional training courses in the field of packaging. The necessity of holding scientific courses targeting packaging of commodities in universities and community colleges while joining such courses with practical training sessions make it feasible to develop the creative skills of students and offer them the necessary scientific expertise.

Our study concluded that "technological capacities of the organization" positively influence quality of packaging. Participants of our study rated the component of this variable according to the following sequence: suitable training to use new technologies, investment on research and development activities, capabilities of employees to use existing technologies in organization, and using information systems to support affairs. Thus, it is vital that pharmaceutical companies by holding workshops and professional training courses concerning new technologies of packaging will pave the way for practicing these findings and enhances technological potentials, production variety, as well as improvement in quality and distribution through motivating the investment in research and development. Additionally, such events may help firms to apply information technology for achieving their ultimate goals.

Silayoi & Speece (2004) showed that technologies applied in packaging industry are a main factor effective in decision making process of customers.

The result of our study showed that “managers and employees tendency to abandon the existing knowledge” positively influences the packaging quality. Accordingly, the components of this variable, including receiving, integrating and sharing knowledge from outside the company, information seeking through direct interaction with customers and suppliers have equal impact priority on the quality of packaging. This can be partially possible through visiting other successful courtiers pioneering in the packaging industry. Hence, our advices that pharmaceutical companies need to consider the role of knowledge and its dissemination to enhance the learning capabilities within the organization structure. This can pave the way for innovation in the packaging to stimulate consumer interest. And benefit foundational knowledge to recognize and evaluate relevant scientific progressions and integrate them with existing knowledge and capabilities during the innovation process.

Our study also concluded that “concentration on core competencies of the organization” has a positive impact on quality of packaging. Moreover, the components of this variable including, staff and administrators familiarity with the firm’s core capabilities, potential access to diverse and widespread markets, as well as improvement and development of key and special skills of personnel showed equal impact priority on the quality of product packaging. Thus, it is Important that pharmaceutical companies invest on their core competencies in order to keep their balance in the competitive market. And inform their employees about the advantages of proper packaging to enhance the efficiency of their productive factors. In addition, business owners should consider providing desired resources and facilities for better and more desirable packaging.

In addition to the above mentioned variables, we also found that “lack of investment on previous technologies” may also influence the quality of packaging through a positive association. Such as that, the priorities were remarked by the participants in the dealt with following order: use of advanced machinery and equipment’s, upgrading technological skills of staff, as well as assessing the technological needs of organization in different timeframes. We came to the conclusion that reviewing packaging machinery may aid pharmaceutical companies to be equipped with high efficiency and greater accuracy. Used of the best and latest technologies to cope with change, because new technologies provide more effective way for conducting procedures, meanwhile realizing variety and quick access to new markets enhances the chance to obtain competitive advantages.

Esmailpour (2009) stated that packages with newer technologies are highly selected by consumers.

Our study also confirmed the positive impact of “strategic relation of the organization with customers and suppliers” on the quality of packaging. Components of this variable having equal impact priority were ranked by participants as the following: degree of local geographical presence of company surrounded by customers and suppliers, along with the extent of the presence of the directors and staff among the customers and suppliers. Therefore, it is recommended that Pharmaceutical companies establish strong relationships with suppliers and customers, such that to coordinate their aims in the field of packaging with their performance.

Undoubtedly, this research cannot give a clear image of the current situation, rather it can provide a basis for conducting further investigations in this field such as a comprehensive analysis of the impact of appropriate packaging in the performance of pharmaceutical companies, inevitability of changes in product packaging to improve selling of pharmaceutical products, and planning to enter into competitive markets.

REFERENCES

- [1] E. F. Schmid and D.A. Smith, "Managing Innovation in the Pharmaceutical Industry", *Journal of Commercial Biotechnology*, 12(1), 50–57, 2005.
- [2] C. M. Kunal and D. Akhilesh and B. Sh. Kumar, "Recent Trends in Pharmaceutical Packaging", *International journal of Pharmaceutical and Chemical Sciences*, 1 (3), 933-943, 2012.
- [3] N. Aslan Zadeh and J. Ghorbani, "The Importance of Market Research in the Pharmaceutical Industry (looking at challenges and opportunities)", *Medication and Treatment*, 97, 34-37, 2012.
- [4] A. Alizad Monir, "Rexam Report of The Packaging", 74, 17-50, 2011.
- [5] M. S. Kumbhar, N. H. Choudhary, D.A. Dighe and M. Ch. Singh, "Tamper Evident Pharmaceutical Packaging—needs and Advances", *International Journal of Pharmaceutical Sciences Review and Research*, 13(2), 141-153, 2012.
- [6] E. Swain "Industry Outlook: Pharmaceutical Packaging", Consulted 6 February 2012, <http://www.pmpnews.com/article/industry-outlook-Pharmaceutical-Packaging>
- [7] S. Sunder "Pharmaceutical packaging - A growing phenomenon", Consulted 6 February 2012, <http://www.expresspharmaonline.com/20110131/packagingspecial03.shtml>
- [8] N. Zadbuke and S. Shahi and B. Gulecha and A. Padalkar and M. Thube, "Recent Trends and Future of Pharmaceutical Packaging Technology", *Journal of Pharm Bioallied Sciences*, 5(2), 98–110, 2013.
- [9] A. Verma, "The Role of Packaging in the Sales Promotion of Pharmaceutical Products", Ph.D. dissertation, Tibrewal University, Vidyanagari, 2012.
- [10] F. Hayes, "Read in Trends & Concerns of the Pharmaceutical Packaging Industry", 7 February 2012, http://www.lifescienceleader.com/index.php?aid=4104&layout=article&option=com_jambozine&view=page.
- [11] R. Pilchik, "Pharmaceutical Blister Packaging, Part I (Rationale and Materials)", *Pharmaceutical Technology*, 68-74, 2000.
- [12] R. Jafari, "A Review of the Pharmaceutical Products Packaging", *Packaging Industry*, 87, 18-21, 2012.
- [13] A. Magnusson and M. Roese and A. Olsson, "Finding Methods for Innovative Packaging Development: The Card Approach", 1-51, 2012.
- [14] Sh. Gilaninia and S. M. Shabgoon Monsef and F. Soleymani, "Effect of Packaging Quality on Performance of Saffron Export", *Interdisciplinary Journal of Contemporary Research in Business*, 4(12), 463-459, 2013.
- [15] K. Polyakova, "Packaging Design as a Marketing Tool and Desire to Purchase", *Saimaa University of Applied Sciences Faculty of Business Administration, Lappeenranta Degree Programmer in International Business*, 1-81, 2013.
- [16] M. Godarzvand Chegini, "Implementation of Deming Principles is a Way towards Total Quality Management", 39, 143-167, 2008.

- [17] V. Pareek and A. Khunteta, "Pharmaceutical Packaging: Current Trends and future", *International journal of pharmacy and pharmaceutical Sciences*, 6(6), 480-485, 2014.
- [18] R. Mcadam and N. Barron, "The Role of Quality Management in Pharmaceutical Development: Clinical Trials Analysis", *International journal of Health Care Quality Assurance* 15(3), 106-123, 2002.
- [19] M. Davari, "Recognition of barriers and challenges impeding quality of products and services", *Third Conference on Quality Management*, 2012, 376-386.
- [20] A. Fathi and A. Basim, "The Extent of Awareness of Managers of Jordanian Industrial Companies regarding the Importance of the Commodity Packaging Quality from the Viewpoint of the Consumer", *Interdisciplinary journal of contemporary research in business*, 2(10), 142 -158, 2011.
- [21] GR. Holmes and A. Paswan, "Consumer Reaction to New Package Design", *Journal of Product & Brand Management*, 21(2), 109-116, 2012.
- [22] R. Bahraini, V. Bahraini and R. Farashbandi, "Analyzing the Effect of the Quality of Packing on Customer Behavior from Bushehr's Chain Market Customer's Point of View", *First National Conference on Accounting and Management*, 2013.
- [23] D. P. Price and M. Stoica and R. J. Boncella, "The Relationship between Innovation, Knowledge, and Performance in Family and Non-family Firms: an Analysis of SMEs", *Journal of Innovation and Entrepreneurship*, 2(14), 2-20, 2013
- [24] B. Bigliardi and E. Bottani and R. Montanari and G. Vignali "Successful New Product Development in the Food Packaging Industry: Evidence from a Case Study", *International Journal of Engineering, Science and Technology*, 2(9), 13-24, 2010
- [25] Ch. Qing, "Measuring Consumer Resistance to Innovation in Meat Packaging Evidence from Choice Experiment", M.S. thesis in Agricultural and Resource Economics University of Alberta, 2012.
- [26] A. Candemir and A. E. Zalluhoglu, "Exploring the Innovativeness and Market Orientation through Mission and Vision Statements: The Case of Istanbul Stock", *Social and Behavioral Sciences*, 99, 619-628, 2013.
- [27] D. Jimenez-Jimenez and R. Sanz-Valle, "Innovation, Organizational Learning, and Performance", *Journal of Business Research*, 408-417, 2011.
- [28] A. C L. Yeung, h. L. Kee and R. W Y. Yee, "Organizational Learning, Innovativeness and Organizational Performance: a Qualitative Investigation", *International journal of Production Research*, 45(11), 2459-2477, 2007.
- [29] S. Clegg, M. Kornberger and T. And Pitsis, *Managing and Organizations: An Introduction to Theory and Practice*, 3d. ed. 2011.
- [30] M. Makri and T. A. Scandura, "Exploring the Effects of Creative CEO Leadership on Innovation in High-technology Firms", *The Leadership Quarterly*, 21(1), 75-88, 2010.

- [31] P. F. Drucker, "The Discipline of Innovation", *Harvard Business Review* (August), 76, 105-115, 2002.
- [32] J. Hayes and P. Finnegan, "Assessing the Potential of E-business Models: towards a Framework for Assisting Decision-makers", *European Journal of Operational Research*, 160, 365–379, 2005.
- [33] M. Vernuccio and A. Cozzolino, "An Exploratory Study of Marketing, Logistics, and Ethics in Ppackaging Innovation", 13(3), 333-354, 2010.
- [34] Th. W. Parsons, Th. W. Jackson and R. Dawson, "What Drives Pharmaceutical Innovation and Knowledge Exchange? A Study Supporting the Use of Knowledge Management within the Pharmaceutical Industry", Conference at the University of Warwick, Coventry on 20th -22nd, 2006, 1-16.
- [35] A. Herrmann and T. Tomczak and R. Befurt, "Determinants of Radical Product Innovations", *European journal of Innovation Management*, 9(1), 20-43, 2006.
- [36] E. T. Micheels and b. H. Gow "Market Orientation, Innovation and Entrepreneurship: An Empirical Examination of the Illinois Beef Industry", *International Food and Agribusiness Management Review*, 11(3), 31-56, 2008.
- [37] M. Augusto and F. Coelho, "Market Orientation and New to the world Products: Exploring the Moderating Effects of Innovativeness, Competitive Strength, and Environmental Forces", *Industrial Marketing Management*, 38(1), 94-108, 2009.
- [38] Suliyanto."The Role of Market Orientation and Learning Orientation in Improving Innovativeness and Performance of Small and Medium Enterprises", *Asian Social Science*, 8 (1), 134-145, 2012.
- [39] Sh. Roozbahani,"Factors Affecting Technological Innovation in Small and Medium Enterprises", M.S. thesis, Islamic Azad University ,2007
- [40] B. Rundh, "The Multifaceted Dimension of Packaging, Marketing Logistic or Marketing Tool?" *British Food Journal*, 107 (9), 670-684, 2005.
- [41] S. Mahajan, R. O Vaishya, A. Gupta and V. Dholle, "Role of Packaging for Enhancing the Sales Appeal", *Global Research Analysis*, 2(7), 111-114, 2013.
- [42] M. Raha, "Innovation In Packaging", *Iran prints Magazine*, 339, 1-111, 2010.
- [43] F. Rahimnia, M. Alavi and M. Najafi Siahroodi, "Systematic Approach in Packaging Management by Providing a Comprehensive Model in the Products' Packaging Process", *The Third Conference on Marketing Management*, 2008.
- [44] H. Esmailpour, P. Ghaffari and A. h. Matin Rad, "The Role of Packaging on Purchasing Decisions in Terms of Food Packaging", *Industry, and Entrepreneurship*, 51, 2010.
- [45] P. Chirag J, S. Tyagi, P. Jaimin, P. Pinkesh, T. parashar and Soniya, "Pharmaceutical Packaging: Containers & Closures", *Journal of Biomedical and Pharmaceutical Research* 1 (3), 22-32, 2012.
- [46] H. Pour Kachlami, "Innovations in Packaging, Green Packaging", *Journal of Technology and Packaging Industry Development*, 85, 48-51, 2012.

- [47] N. Khanlarzade, "Genetic algorithm to optimize two-echelon inventory control system for perishable goods in terms of active packaging", M.S. thesis, Tarbiat Modares University, Iran, 2011.
- [48] S J. Eilert, "New Packaging Technologies for the 21st Century", *Meat Science*, 71(1), 122-127, 2005.
- [49] V. Butkeviciene, J. Stravin skiene and A. Rutelione, "Impact of consumer package communication on consumer decision making process", *Engineering Economics*, 1(56), 57-65, 2008.
- [50] B. Stewart, "Packaging Design Strategies", 2d. Ed. the UK: Pira International, 2004.
- [51] P. Dobson and A. Yadav, "Packaging in a Market Economy: The Economic and Commercial Role of Packaging Communication", Norwich business school, University of East Anglia, 1-69, 2012.
- [52] P. Silayoi and M. Speece, "Packaging and Purchase Decisions: An Exploratory Study on the Impact of Involvement Level and Time Pressure", *British Food Journal*, 106 (8), 607-628, 2004.
- [53] O. Ampuero and N.Vila, "Consumer Perceptions of Product Packaging", *Journal of Consumer Management*, 23(2), 112-100, 2006.
- [54] P. Silayoi and M. Speece, "The Importance of Packaging Attributes: a Conjoint Analysis Approach", *European Journal of Marketing*, 41(11/12), 1495-1517, 2007.
- [55] B. Rundh, "Packaging Design: Creating Competitive Advantage with Product Packaging", *Journal of British Food*, 111(9), 988-1002, 2009.
- [56] P .d. Luca and P. Penco,"The Role of Packaging in Marketing Communication: an Explorative Study of the Italian Wine Business", 3rd International Wine Business Research Conference, Montpellier,1-18, 2006
- [57] M. Matsuo, "Customer Orientation, Conflict, and Innovativeness in Japanese Sales Departments", *Journal of Business Research* 59,242 – 250, 2006
- [58] M. Konigstein and W. Muller, "Why Firms Should Care for Customers", *Economics Letters* ,72 ,47–52, 2001
- [59] K. Uusitalo and H. Hakala and T. Kautonen, "Customer Complaints as a Source of Customer-Focused Process Improvement: A constructive Case Study" *Int. Journal of Business Science and Applied Management*, 3(1), 2-13, 2008
- [60] B. J. Jaworski and A K. Kohli , "Market orientation: Antecedents and consequences", *Journal of Marketing*,57,53-70
- [61] M. Borges and N. Hoppen and F B. Luce, "Information technology impact on market orientation in e-business", *Journal of Business Research*, 62, 883–890, 2009
- [62] S. Olavarrieta and R. Friedmann "Market orientation, knowledge-related resources and firm performance", *Journal of Business Research*, 61(6), 623–630, 2008
- [63] H. Gheysari and A. Rasli and P .Roghianian and N. Norhalim "A Review on the Market Orientation Evolution", *Procedia - Social and Behavioral Sciences*, 40, 542 – 549, 2012

- [64] I. M. Salim and M. Sulaiman, "Organizational Learning, Innovation and Performance: A Study of Malaysian Small and Medium Sized Enterprises", *International Journal of Business and Management*, 6 (12), 118-125, 2011
- [65] A. Mat and R. Ch. Razak, "The Influence of Organizational Learning Capability on Success of Technological Innovation (Product) Implementation with Moderating Effect of Knowledge Complexity", *International Journal of Business and Social Science*, 2(17), 217-225
- [66] R. J. Calantone and S. T. Cavusgil and Y. Zhao, "Learning Orientation, Firm Innovation Capability, and Firm Performance", *Industrial Marketing Management* 31, 515 – 524, 2002
- [67] M. rajaie and B. Khamoosh Poor, "Comparison of the effects of innovation and productivity in Iran, the United States and European countries", *Journal of Iran rubber industry*, 67, 53-38, 2012
- [68] R. Ansari and J. Soltan Zadeh, "Provide a Framework for the Implementation of Technology Management in Technology-based Firms", *Journal of Technology Growth*, 8 (32), 22-31, 2012
- [69] F. Betz, "Managing Technological Innovation", John Wiley and Sons, 2003
- [70] G. M. Guzman and M. d. C. M. Serna and D. G. P. d. Lema, "The Relationship between Knowledge Management and Innovation Level in Mexican SMEs: empirical evidence", 1-19
- [71] K. B. Ooi, "TQM: A Facilitator to Enhance Knowledge Management? A structural Analysis", *Expert Systems with Applications* 41, 5167–5179, 2014
- [72] S. Agha and L. Alrubaiee and M. Jamhour "Effect of Core Competence on Competitive Advantage and Organizational Performance" *International Journal of Business and Management*, 7(1), 192-204, 2012
- [73] G. Uysal, "Core Competence: A Competitive base for Organizational Success", 5-16
- [74] C.K. Prahalad and G. Hamel, "The Core Competence of the Corporation" *Harvard Business Review*, 79-90, 1990
- [75] M. Manteghi and H. Godarznasari, "Evaluation of Samand car production technology transfer to Syria and its application methods", *Improvement Management*, 5, 82-99, 2011
- [76] A. Ali Ahmadi and S. Ghazinoori, "Technology Foresight and its Application in Policy and Technology Management", *Journal of Tomorrow Management*, 2, 5-12, 2003
- [77] B. Stone, R. Jacobs, "Successful Direct Marketing Methods", Eighth Edition, McGraw-Hill, 2007
- [78] A. Parvatiyar and J. N. Sheth, "Customer Relationship Management: Emerging Practice, Process, and Discipline", *Journal of Economic and Social Research* 3(2), 2-34, 2001
- [79] CR. van Zyl, "Supplier Relationship Management Leverages Intellectual Capital for Increased Competitive Advantage", *Acta Commercii*, 57-69, 2005

- [80] J. C. Narver and S. F Slater, "The Effect of a Market Orientation on Business Profitability", *Journal of Marketing*, 54 (4), 20-35, 1990
- [81] R.W. Ruekert, "Developing a market orientation: an organizational strategy perspective"; *International journal of Research in Marketing*,9(3),225-245, 1992
- [82] R. Chiva and J. Alegre and R. Lapidra, "Measuring Organizational Learning Capability among the Workforce", *International Journal of Manpower*, 28 (3), 224-242,2007
- [83] P. J. Gomez and J. C. Lorente and R. V. Cabrera, "Organizational Learning Capability: A Proposal of Measurement", *Journal of Business Research* 58 (6) 715–725, 2005
- [84] S. Lahteenmaki and J. Toivonen and M. Mattila, "Critical Aspects of Organizational Learning Research and Proposals for Its Measurement", *British Journal of Management* 12(2), 113-130,2001
- [85] A. Stone and K. Flamm, "Knowledge and Productivity in the Pharmaceutical Industry",1-6
- [86] J. J .Chanaron and D. Jolly, *Technological Management: Expanding the Perspective of Management of Technology*. Management Decision 37 (8), 613-620,1999
- [87] G. Dessler, "Essential of Human Resource Management", Prentice Hall College Div,1999
- [88] J. M. Ribault and B. Martinet and D. Lebidoit, (1991). "Le management des technologies", Paris, Les Editions d'Organisation, 1-390, 1991
- [89] S. Popadiuk and C. W. Choo, "Innovation and Knowledge Creation: How is this Concepts Related?" *International Journal of Information Management* 26(4), 302–312,2006
- [90] M. Torkkeli and M. Tuominen, "The Contribution of Technology Selection to Core Competencies", *International Journal of Production Economics*, 77(3), 271-284,2002
- [91] R. Phaal and C.J.P. Farrukh and D.R. Probert, "Technology Management Process Assessment: A Case Study", *International Journal of Operations & Production Management*, 21(8),1116-1132,2001
- [92] K .A. Moore, "Value mapping framework involving stakeholders for supply chain improvement when implementing information technology projects", Ph.D thesis, M.S. University of Central Florida, 2008