

Effects of Industrial Technology on the Satisfaction of the Housing Customers

(Case Study: Housing Construction Industrial Companies of Tehran)

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Abstract: Industrial technology of housing is one of the effective factors in the development of technology and the development of family economy as well as specialized employment which has been considered by many countries all over the world. The industrialization process should be managed for industrialization technology to become a satisfaction factor for the housing customers. Industrialization is a complex process and affected by many factors, each of which can be serious obstacle for the housing customers' satisfaction. The present study entitled as "industrial technology on the satisfaction of the Housing Bank Customers" is provided to identify and rank the factors in the process of industrialization in housing customers' satisfaction. By identifying and understanding the most important factors, it facilitates the industrialization process for developers by the industrialization of technology and helps them in gaining competitive advantage. The present study is an applied research in terms of purpose. The reliability test that was conducted through Cronbach's alpha showed that the questionnaire and instrument had a good reliability (91.3%). The hypotheses were tested using simple linear regression and correlation test. It was found that all components have been effective and there was a significant relationship between them. The main hypothesis was tested using simple linear regression and correlation coefficient. It was found that the technology was effective industrialization on customer satisfaction, and there was a significant positive relationship between the two variables.

Keywords: Housing, Industrial technology, Customer Satisfaction.

Introduction

Today, the pilot of leadership development is not wealth and manpower numbers, but human knowledge and the effective management of this knowledge. Examining the experiences and achievements of the leading organizations worldwide suggests that this leadership and innovation has not been possible except in the light of the creation, processing, development, sharing, recording and dissemination of knowledge. One of the important environmental factors is the customers of an organization. The experts of management consider the customer satisfaction as one of the most important tasks and priorities of management and necessity of steady adherence of the top management for attracting the customer satisfaction is considered as the main prerequisites of success. One of the important requirements in the development of organizations and companies is to consider the customer's satisfaction and attracting them as their main objectives and activities. The terms customer and customer satisfaction in service companies, particularly housing industrial companies has become mostly important because of the total dependence on customers in order to survive. Providing affordable housing by the

companies to retain the existing customers and absorption of new customers and finally, to gain a bigger share of the competitive housing market, indicates this important. So, awareness of the mental image of the industrial companies among the customers in order to identify the strengths and weaknesses and the promotion of performance is one of the key priority for all organizations, especially industrial enterprises of housing (Alvani, 2004). Customer satisfaction is influenced by many factors, one of the most important of which is the quality of the product or service. In fact, customer satisfaction and service quality are closely related. It should be noted that quality is determined by the customer rather than by the manufacturer or the servers. In other words, quality is a set of services and specifications of a product or service that provides the requirements and consumer satisfaction. So as mentioned above quality includes a set of characteristics and features of services that provide customer satisfaction.

It should be noted that today's fierce competition among housing manufacturers along with the rising customer expectations for high quality services and rapid changes in technology has required the companies to provide quality services to customers and keep them satisfied. Therefore it is necessary that corporate executives in order to identify the elements of quality and provide better services do some scientific research on the subject. It should also be noted that one of the ambiguous points for the managers of housing companies is lack of awareness about the level of service quality which needs gaining necessary knowledge in this area. Another important point that should be noted is that the priorities of the current quality of services provided to customers is not clear to managers of firms that it must also be considered to change the weaknesses into the strengths and thus make customer satisfaction. In the current situation in the country despite the existence of many technology components, ranging from the mass of young and specialist manpower, advanced machinery available, as well as the relative development of technical knowledge, documentation and information systems, the development projects has not yet achieved the degree of appropriateness and optimum efficiency. Knowledge of the current status of each system and its processes is the first step for decision-making and policy-making in the management of the system. One of the solutions for the project management for the optimal use of component technology is the correct study the technology of housing construction (Bayat, 2006). The present study attempts to identify the effects of industrial technology in housing construction and its impact on customer satisfaction and eventually using the results of the study, some recommendations are made in response to the questions provided. The impact and importance of housing and its role in the economy is known for everyone. Housing has long been considered as one of the basic needs of families, not just as a shelter but also is regarded as an important asset and has high social and economic value (in determining social status). However, with the arrival in the recent decades and saving energy and attraction points, and factors affecting the housing customers, the construction companies in the process of industrialization have been made to satisfy their customers. In some cases industrial companies are not aware of the cause of all the factors affecting customer satisfaction and have been faced with the losses. Thus this study tries to identify the industrialization hidden factors and examine their impact on customer satisfaction survey.

Literature Review

- Customer: customer is a person or entity that is directly or indirectly offered by the goods and services in the market.
- Satisfaction: satisfaction can be achieved by our different understanding of the customer expectations and the actual performance of the product or organization.

Customer satisfaction is created as a result of customer perception during a transaction or relationship value so the price is equal to the ratio of quality to the price and cost of customer service. The definition of customer satisfaction is accepted by many experts: Customer satisfaction is a result of the comparison of the expected performance prior to the customer purchasing with the actual perceived performance and the cost paid. Gronroos (2000) defined customer satisfaction as a customer feeling or attitude toward a product or service after its use. The two researchers suggest that customer satisfaction is the main result of marketing activity which acts as the communication between the various stages of consumer buying behavior works. For example, if customers are satisfied by certain services, their purchase will likely repeat. Satisfied customer may also speak with others about their experiences. As a result, they engage in positive word of mouth advertising. In contrast, unsatisfied customers will probably cut their ties with the company and engage in negative word of mouth advertising. In addition, behaviors such as repeated purchases and word of mouth advertising directly affect a company's survival and profitability. Brady and Robertson in a cross-cultural study tried to examine the relationship between service quality and customer satisfaction. They intended to determine if the impact of the concept of satisfaction and service quality on behavioral outcomes, such as loyalty and verbal communication in different service environments is similar. The results of their study in the American society and Ecuador showed that in both American and Ecuadorian society, it is the quality of service that leads to customer satisfaction. They stated that the quality of services for the world inclusion of all communities is prior to the customer satisfaction. They

also showed that changes in the quality of service towards customer satisfaction better predicted the behavioral outcomes. Today, all organizational units, companies and institutions around the world, customer orientation and professional and industrial past where the work, customer satisfaction is a key factor to their success.

This is also very important and necessary for both is the same for profit organizations such as businesses - industrial as well as for-profit organizations such as universities and hospitals. It should be noted that satisfied customers are much more than a financial plan and invest for profit organization; and much more of a staffing plan to make staff satisfaction and provide the market much better than a system of marketing and sales for companies. In other words, managers should be aware of how to achieve customer satisfaction is more important than all of these issues. A review of the literature shows that researchers in the social sciences and psychology over the past thirty years have at least provided twenty definition of customer satisfaction. There are three main shared factors in all these definitions and thus can provide a basis for a comprehensive definition of satisfaction (Kimasi, 2006).

These factors include:

1. Customer satisfaction is an emotional response (emotional) or a state of mutual understanding and recognition.
2. Customer satisfaction is a response about the focus on the expectations from production and consumption or service experience and the like.
3. Customer satisfaction is a reaction that takes place in a period of time. For example, after the first choice or by successive and accumulated experience and so on.

Another group of pioneer researchers believe that customer satisfaction does not only refer to their expectations only but considering the needs, specially their basic needs such as safety requirements, respect and justice is also important because needs are different from the expectations. Expectations are conscious, clear, the short-term and at surface while needs are unconscious, general, deep and long lasting until they are not active. When expectations are not met, there is dissatisfaction and disappointment but when their basic needs are not met they may be angry or exasperated. If a customer is not satisfied, he will be lost. So the customer satisfaction means meeting the customer needs completely and as he wishes at the same time and in the same way that he wants (Prugsamatz & Pentecost, 2006).

Industrialization is a process that improves quality, construction time and labor to increased output and optimizes the operation of equipment, facilities and technology. Customer satisfaction: Historically, customer satisfaction is one of the main areas of management at marketing and business academic level. Customer satisfaction in consumer goods marketing and research related to the more ordinary consumers is defined as “the level at which the consumer buying expectations is provided with the purchased product” and places customer satisfaction is one of the reasons for the growth. Satisfied customers can become a powerful competitive advantage which increases the market share and profitability. In industrial marketing, customer satisfaction with the elements and results-driven is the exchange process between the organizations. However, until now, the process has been considered as the traditional exchanging process of interaction and short-term economic exchange between the two sides in the industrial markets. Therefore, to measure the customer satisfaction in the industrial area, knowing these members is the critical factor. The second challenge is related to the definitions of satisfaction: “satisfaction is the customer’s positive and good response and judgment about the properties of a product and shows an acceptable level of success of the consumer”. There are two problems with the use of this definition in the industrial environment. Firstly, many employees of the customer organization do not have any direct experience with the product that they judge. Secondly, in addition to psychological and personal dimension that exists in the definition of industrial customers, your goals are reasonable and realistic judgment of the commercial relationship is considered unsatisfactory. Ultimate Challenge: This is a must more comprehensive model for measuring customer satisfaction in the field of industrial design that involve a variety of customer and supplier relationships.

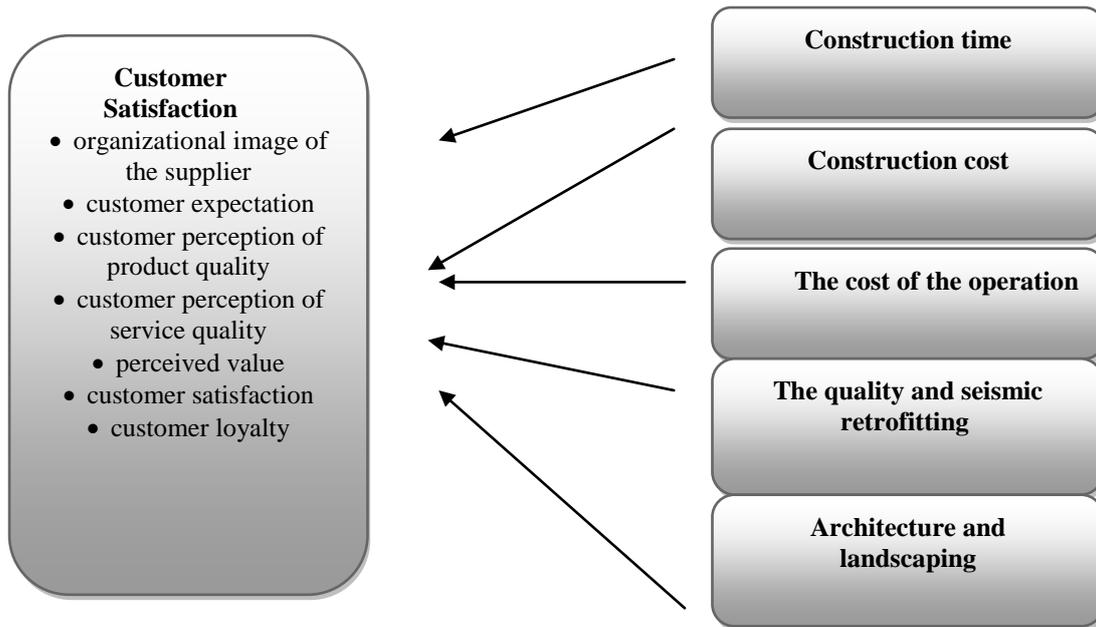


Figure 1. Research model.

Hypotheses

The main hypothesis: Industrialization technology is effective on the housing customer satisfaction and there is a significant positive relationship between them.

Sub-hypotheses

- Construction time is effective on the housing customer satisfaction and there is a significant positive relationship between them
- Construction cost is effective on the housing customer satisfaction and there is a significant positive relationship between them.
- The cost of operation is effective on the housing customer satisfaction and there is a significant positive relationship between them
- The seismic retrofitting is effective on the housing customer satisfaction and there is a significant positive relationship between them
- Landscaping is effective on the housing customer satisfaction and there is a significant positive relationship between them

Materials and Methods

Research Method: The present study is an applied research in terms of purpose and correlational descriptive in terms of nature and method since it has describes the present time and what exists now.

Data collection: The required data in this study was collected through interviews, surveys, and library studies and collection of field data obtained in the industry.

Research population and sample: The study population consisted of 45 participants, including the experts and 240 of the customers of the housing section. Sampling was done based on a combined method (stratified random sampling and cluster sampling) which is a subset of probable sampling. According to Morgan's table, questionnaires were distributed among 148 of the participants.

Data analysis: Inferential statistics included the Spearman correlation coefficient (due to the using data ranking) to assess the relationship, simple linear regression to examine the effects and Cronbach's alpha for reliability.

Research Design: Time: examining the implementation of knowledge management and its effect on customer satisfaction was conducted since May to September 2015, or in other words, this is a cross-sectional research.

Location: the industrial housing companies in Tehran

Subject: Discussions of quality management and organizational efficiency

Research Instrument

Validity: In order to examine the validity, one should answer the question that whether the instrument must measure what it aims to? In order to answer this question, research questions were examined by help of some experts and scholars in order to remove the ambiguities which indicated the acceptable content validity of the research instrument.

Reliability: The reliability is one of the technical characteristics of measuring instruments and deals with the fact that if the measuring instrument provides the same results in the same extent which reliability refers to the accuracy, stability and reproducibility of test results. In other words, the reliability coefficient indicates the extent to which measurement tool characteristics or features variable measures the stable subjects. The reliability of the questionnaire was examined by Cronbach's alpha using the data obtained from the questionnaires and by SPSS software, the result of which are as follows:

Table 1. Variable reliability.

Component	Alpha coefficient
Construction time	0.811
Construction cost	0.856
The cost of operation	0.799
The quality and seismic retrofitting	0.836
Architecture and landscaping	0.846

Results

Reliability coefficient by Cronbach's alpha was used and the total scale's Cronbach's alpha was 91.3%, which demonstrated the stability and internal consistency of the questionnaire. To calculate the Cronbach's alpha coefficient, the variance of scores for each subset of the questionnaires and total variance should be calculated first. Cronbach's alpha is calculated the following formula:

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum_{i=1}^k S_i^p}{\sigma^p} \right) \quad \text{OR} \quad \alpha = \frac{k\bar{C}}{\bar{V} + (k-1)\bar{C}}$$

Where K is the number of questions in this regard, S_i^p is the variance of the ith question, σ^p is the variance of total questions, \bar{C} is the average of the covariance between questions, and \bar{V} is the variance of the questions.

Correlation Analysis: Correlation analysis is a statistical instrument to determine the type and degree of relationship of a variable with another variable. One of the criteria used to determine the correlation coefficient is variable. The correlation coefficient shows the significance of the relationship and the type of relationship (direct or inverse). This index is between 1 and -1 and lack of relationship between the two variables is zero.

Spearman Correlation Coefficient: The correlation coefficient is a parametric method used for normally distributed data or a large number of data. Spearman correlation coefficient was calculated using the following equation.

$$r = \frac{\sum xy - n\bar{x}\bar{y}}{\sqrt{\sum x^2 - n\bar{x}^2} \sqrt{\sum y^2 - n\bar{y}^2}}$$

Table 2. Assuming the test results.

Hypothesis	Variables	Correlation coefficient	Approve or reject
H1	Construction time	0.423	Approved
H2	Construction cost	0.546	Approved
H3	The cost of operation	0.415	Approved
H4	The quality and seismic retrofitting	0.354	Approved
Main	Architecture and landscaping	0.298	Approved

Discussion and Conclusion

In this study, we tried to examine the effects of industrial technology on the satisfaction of the Housing Bank Customers. For this purpose, the effective factors were recognized at five levels of construction time, construction costs, the cost of the operation, quality of construction and architecture for seismic retrofitting and landscaping and were analyzed using appropriate statistical methods. In this chapter, a summary of this research as well as the conclusions and recommendations of the researcher for future research are presented. The research of identifying and ranking the effects of industrial technology on the housing customers' satisfaction is an applied study in terms of purpose and descriptive based on the time of study. Further, it is an exploratory research since for obtaining the data and full understanding of the subject, some questions have been raised and no assumption is provided based on prior knowledge. This study is in fact intended to identify key variables and factors and their relationship by the help of the experts. In this study, a case study is used to better understand and interpret observations. The population in this study is composed of experts. Due to lack of sufficient awareness and identical understanding of the industrial housing concepts, the managers and specialists were asked for information. The population of the study included 45 experts due to the small population size, number of population is considered as the total population selected from among the 45 distributed questionnaires. The process of this research is summarized as follows:

1. Library studies and reviewing research on the subject
2. Identify criteria and sub-criteria (factors) with the use of experts
3. Relevant questionnaire
4. Questionnaire and receiving a questionnaire completed by experts
5. Inventory data extraction
6. Analysis of the questionnaires

The survey data was collected in two ways using library references and field study. The library method was used to collect the basic information required for the development of literature. Distributing the questionnaires and interviews with experts was used as the field data collection to determine the relative importance of the evaluation factors using pairwise comparison options. In order to identify the effects of industrial technology in housing customers' satisfaction, five criteria were identified using the studies in the literature, similar studies as well as interviews with some of the experts. A total of 25 sub-criteria were identified and based on the experts agreement on all the factors, all the factors identified in the questionnaire were included to determine the importance and were eventually ranked. With the study of papers, thesis-related resources and research, the effects of industrial technology on housing customers' satisfaction were identified; the most important of these factors are as follows:

1. Taking advantage of pre-built systems and industrial production building
2. Reducing the diversity in the production of parts in order to use them in different buildings
3. Increasing the manufacturing quality control for manufacturing parts factory
4. Accelerating the operations and reduce the time of construction building
5. The use of labor-saving in construction
6. Reducing the cost of manufacturing for mass production of parts
7. The optimal use of computer facilities in the building design and technical calculations
8. The possibility of mass building and solving the housing shortage
9. Effective collaboration between designers, developers, investors and buyers
10. The development of international technical cooperation in the field of industrial building
11. Reducing the price by workers return
12. Improving the quality and functionality with traditional construction
13. Increasing the safety, reducing the structural weight, mass optimization process in the short term and investing in the construction of housing units

Based on the identified factors, the experts believed that scheduling to meet existing deficiencies and the needs of each factor can lead to positive results and success of the housing industry as well as customer satisfaction in the industry.

Conflict of interest

The authors declare no conflict of interest

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