

Evaluation of Total Quality Management Influence on Operation in Iran's Automobile Industry

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ABSTRACT — The goal of this study is to provide a pattern in order to evaluate the application of total quality management influence on operation through moderating role of risk management in Iran's automobile manufacturing industry. The method used in this study is applicable in sense of goal and survey and solidarity in the sense of descriptive nature, the population of this study is all the Iranian automobile manufacturing industry managers of (Iran Khodro and Saipa companies) and since this society is great, it is considered infinite. Among the population, 384 people were selected via Cochran sample formula for infinite population. In order to select statistical sample, the simple random sampling has been employed. For data gathering, the questionnaire tool was used. In order to analyze data, path analysis test and Smart PLS statistical software was used. The gained results showed that there is a direct and positive relationship between application of Total Quality Management and operational performance $p=(0.420^{***})$. Also the process of risk management adjusts the relationship between application of Total Quality Management and operational performance, $p=(0.21^{**})$.

KEYWORD: *Application of Total Quality Management, TQM, Operational performance, risk management procedure*

Introduction

Automobile manufacturing industry is considered as one of the most important industries worldwide, which in addition to the high rate of bringing currency, it prevents currency from leaving the country significantly. Also today like before, the consumers are not willing to accept any product or service and thus, the organization that cannot fulfill the customer expectations, will be forced out of the rivalry. The issue of quality, has become the main and permanent goal of companies and organizations. Among the main factors of this issue, new products in the world, increasing and permanent changes in the customers' demand, technological advancements, and permanent rivalry pressures can be named, all of which have set quality as the only determining and main factor for success and dominance of all the productive and service organizations in domestic and international markets. Quality is a known blessing worldwide, which has been noticed by the customers and organizations greatly, in fact, quality indicates the nature of an organization (Esma'eel Pour, 1994, 4). Studies show that the issue of continues recovery, onetime delivery, and financial services and operation are proposed as the most important competitive business strategies for organizations. Controversial theories exist regarding strategic derivations that improve operation and quality; a group of researchers claim that quality is in accordance with segregation strategy, while another group believe that quality has a positive relationship with cost reduction and therefore considers cost management strategy more important (Jang and Chen, 2013, 691). In every organization, the management gains its energy and ability through fulfillment of customers' need and organizational maintenance, which is the main philosophy of total quality management. Total quality management is a quality improvement Total quality orientation has been mentioned for companies with the goal of operation improvement in the sense of innovation and quality in the last two decades. Organizations that use TQM gain many benefits such as higher quality products, more customer satisfaction, cost reduction, financial improvement, operational quality and innovation, and above all employee satisfaction improvement. In addition, if TQM is applied successfully, it is considered a competitive advancement (Kamal et al., 2012). Employee operation is influenced by interaction of all the components and parts of the systems. Materials, facilities, human resources, policies, working methods, and above all, corporate culture, which represents the values, are all influential on providing service manners. In order to manage and support total quality management efforts, cultural improvement and its institutionalization is necessary. Evaluating the culture of an organization is in order to make a change in the adjusted culture

with continues quality improvement. San et al. (2006) consider mutual employee insights as the most important human resource based soft factor, which aids the organization achieve total quality management level, which causes the individuals to move toward the set goals and get involved in total quality management plans. Other “soft” factors such as leadership, relationship with the suppliers, and customer satisfaction can ensure corporate originators and managers’ revenues or long-term loss (Chalovo-Mora et al., 2014). In this sense, the possible risks of operation shall not be taken for granted. Many definitions have been defined for risk management, all of which are general definitions. Treadway organization in the U.S for example, considers risk management as a procedure risen from the organization management board, which is employed by the managers and employees of the organization in in order to set investment strategies within the organization and to identify the possible incidents and risks influencing the organizational operation (Wilhelm Wiertsch, 2006). In order to improve quality, the management needs various tools, one of these tools is total quality management system application. Total quality management is basically a culture that consequently turns into a tool. In an overall look, the main purpose of total quality management is involving all the employees of the organization in order to provide services to the customers, through providing premium quality products, decent prices, and After Sale Services (Barandoust, 2001, 37). It has been more than a decade that total quality management has been discussed in management meetings as a unique insight for increasing organizational influence and the sediment of this movement has been moved from private industrial and productive organizations to governmental and even non-profit organizations and bureaucracies (Faqihi, 1999, 28). Accordance of total quality management and its influence on organization operation can be considered as a goal and necessity for Iranian automobile manufacturing industry. One of the key aspects of risk management is risk prioritizing. Risk management can be forward-looking or passive. Forward-looking, is a precautionary approach, based on which we can be ready for when an unpleasant occurrence happens without expecting. While in the passive approach, controlling activities for healing the damages after the occurrence of the incident, is notable (Moqimi et al., 2011). Also organizational risk can prioritize risks based on the possibility of occurrence and their influence on identifying organizations as an adjustable variable. If departments of the organization can identify the time of risk occurrence and their prioritizing them in the qualitative sense, most of the organizational problems regarding facing the possible risks will be solved (William and Bretsch, 2006). One of the ways that can be significantly influential on the quality of this prioritizing, is operating total quality management within the organization that unfortunately is neglected in our industries, especially automobile manufacturing industry and is considered as a challenge for our industrial organizations. Iranian automobile industry is considered as an important and key industries in the range of improving and currency creator industries of the country, which is of significant importance. Choosing this industry is due to achieving a clear understanding of different aspects of organization by the managers and they can make wiser decisions with lower risk. It is assumed that total quality management application can be influential on organizational operation application but so far, about this issue, no scientific study has been conducted to evaluate this claim, also with regards to the existing literature of risk management procedure can adjust the influence of quality management application on operational application, which can be considered of importance. Therefore, in order to evaluate this issue and with regards to the afore mentioned literature, we have decided to provide a decent pattern for application of total quality management and its influence on operational approach and answer this vital question that how aspects of total quality management including employees and managers’ commitment, interactions with the environment, enabling the employees, mutual insight toward the organization, organization focusing on customers, and training can be influential on operational application including financial application, continues quality improvement, on time product delivery, and customer service through the adjustable role of organizational risk management?

Research importance and value

Total quality management and risk management application is an important issue in management literature. The relationship between total quality management and application has been mentioned in many studies but so far, few studies have been conducted on the issue of total quality management influence on operation application inside and outside the country, which adds to the importance of this study. Total quality management can be looked at as a profit generator and risk reducer in automobile manufacturing industry. If total quality management is done properly, it can determine costly procedures and cost saving measures. Total quality management efforts protection, creating culture, and institutionalizing it within the organization is considered as a necessary issue. Without a doubt, total quality management and operational application need special attention to possible risks that can be influential on this process. It is especially important automobile manufacturing industry, which is noted by people and governments as consumers and customers internationally. Some aspects of total quality management insists on creating team, quality, customer satisfaction, and continues recovery. While “Risk management best value is defined as identifying and disposing possible risks that can be considered as two different categories in organizational culture, which will be tended to as a necessity in this study. Due to the above mentioned matters, although most pundits have confirmed the importance of total quality management activities on operation but conducting this study is of importance in this sense that we realize the effects of total quality management aspects on operational application. Also paying attention to the manner possible risks and hazards influence the effect of two variables. So far, numerous studies have been conducted on measuring total quality management aspects influence on risk management process but no study has ever evaluated total quality management aspects on operational application.

Study goals

Main objectives

- Providing a pattern to evaluate total quality management aspect influence on operational application (continues recovery, on time delivery, and financial operation) through risk management moderating role in Iran's automobile manufacturing industries

Secondary objectives

- Determination of leadership commitment influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of acceptance and making relationship influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of close relationship with customers influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of close relationship with distributors influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of organization focus on customers influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of benchmarking influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of training development influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of open organization influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of employee enabling influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of totally flawless production influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of process development influence on operational application (continues recovery, on time delivery, and financial operation)
- Determination of total quality management aspects influence on operational application (continues recovery, on time delivery, and financial operation)

Research hypothesis

Main hypothesis

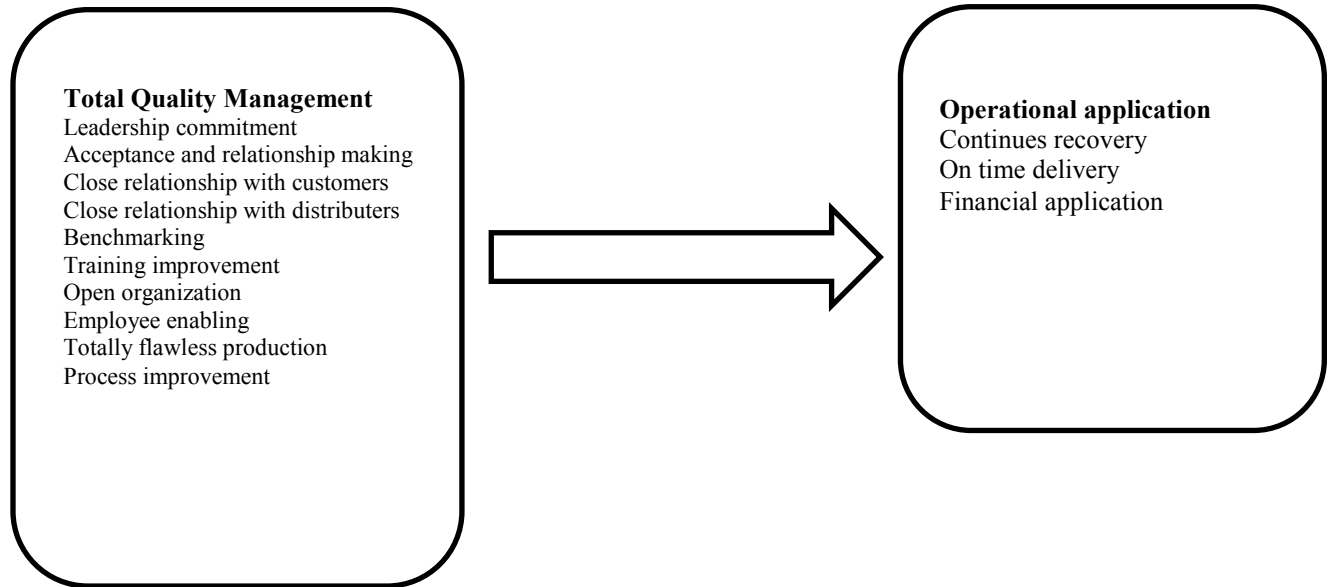
- Total quality management is influential on operational application (continues recovery, on time delivery, and financial operation).
- Risk management process moderates total quality management influence on operational application (continues recovery, on time delivery, and financial operation).

Secondary hypothesis

- Leadership commitment is influential on operational application (continues recovery, on time delivery, and financial operation).
- Acceptance and creating relationship is influential on operational application (continues recovery, on time delivery, and financial operation).
- Close relationship with customers is influential on operational application (continues recovery, on time delivery, and financial operation).
- Close relationship with distributors is influential on operational application (continues recovery, on time delivery, and financial operation).
- Focus of organization on total quality management aspects is influential on operational application (continues recovery, on time delivery, and financial operation).
- Benchmarking is influential on operational application (continues recovery, on time delivery, and financial operation).
- Training improvement influential on operational application (continues recovery, on time delivery, and financial operation).
- Open organization is influential on operational application (continues recovery, on time delivery, and financial operation).
- Employee enabling influential on operational application (continues recovery, on time delivery, and financial operation).
- Totally flawless production is influential on operational application (continues recovery, on time delivery, and financial operation).
- Process improvement is influential on operational application (continues recovery, on time delivery, and financial operation).

Theoretical framework and proposed conceptual model for the study

According to the mentioned subjects and literature, the conceptual model proposed for the study is adopted from total quality management aspects including ten aspects of Shahin and Dabestani (2011) and operational application adopted from Unise et al. (2013). Also risk management variable is considered as a total quality management aspect moderating factor according to William and Bretsch.



Research subject background and history

Chalovo-Mora et al. (2014) in a research titled relationships between key soft and hard total quality management factors and business results found that soft and hard TQM factors including (Management and human resources, mutual strategic management and resources and management processes) are influential on business results. Avid Tareq and Yarkhan (2011) evaluated economic operation on different stages of company measurement, financial leverage, and enabling management risk of big multinational companies in a study. Results of the study shows that economic operation has a positive relationship with company size and risk management ability, and negative relationship with financial leverage. Paul (1995) in a study with the title of improvement and globalization of total quality management application factors found that only three of 12 TQM factors including (application management commitment, open organization, and employee enabling) are significantly related to organizational operation. In another study, Dove et al. (1999) under the title of total quality management in order to achieve operation also shown that among the total of 9 total quality management factors, only three factors of work force commitment, mutual insight, and focusing on customers have a positive significant relationship with organizational operation. Hire et al. (1996) achieved a similar result in their study in the U.S automobile manufacturing companies. They discovered that operation (product quality) is highly related to TQM factors such as enabling, training, and employee involvement. In a study, Kong Bon et al. (2005) evaluated total quality management factors influence on 230 employees’ insight in a productive company in Malaysia. The results show that total quality management application is influential on awareness, teamwork, job satisfaction, life satisfaction, and also organizational commitment. Yung and Feng (2008) in a study under the title of consistency and total quality management with organizational culture evaluation, found that organizational culture has a positive and significant effect on total quality management. Yuan Lou (2007) in a study with the title of leadership, total quality management organizational culture aspects influence on organizational operation found that leadership influences organization operation through organizational culture and total quality management path. Melbrock (2002) evaluated risk management influence on company operation and capital structure. His findings show that risk management and controlling senior managers will lead to operational improvement. Shahin and Dabestani (2011) in a study with the title of total quality management application possibility based on soft factor found that the most regression exists between committed leadership, customer relationship, measure determination, and process improvement as soft factors of quality management application. Also training is the only factor that has regression with other quality management soft factors and leadership has the highest value among quality management application soft factors.

Research Method

The method employed in this study is applicable in the sense of goal and is descriptive of the survey and solidarity type in the sense of data gathering.

Population

The population of the study consists of all the managers of automobile manufacturing industry (Iran Khodro and Saipa) and since this population is great, it is considered indefinite.

Sampling volume and calculation method

In order to determine the sample volume, Cochran sample formula is used.

In order to gain sample volume the Cochran formula is used, 384 of Saipa and Iran Khodro automobile industry managers seem suitable for the study according to determination of sample volume, but since some questionnaires might get distorted or incomplete, the researcher distributed 400 questionnaires and then used 384 of them which were distributed with simple random method.

Data collecting tool

To gather data and information in this study, the field method is used. One of the employed tools in the field method is questionnaire. In this study the questionnaire made with Likert spectrum is used to gather data and information. And the questionnaires are tested by employing suitable statistical technics and study hypothesis. At first description of gathered data is presented; then using SPSS and SmartPLs (Partial least squares) statistical software, data analysis is conducted.

Descriptive statistics

Table (1): Distribution Frequency and participant's sex percentage

Variables \ Number	Observed frequency	Observed percentage
Male	250	65.1
Female	134	34.9
Total	384	100

Based on the above table, of the total 384 people, 250 (65.1 percent) of the participants are male and 134 (34.9 percent) were female. The data indicates that most of the statistical volume consists of men.

Table (2): Frequency and percentage distribution based on age

Age / Number	Observed frequency	Observed percentage
25 to 35 years old	114	29.7
35 to 45 years old	137	35.7
45 years and higher	133	34.6
Total	384	100

Based on the above table, of 384 of the population, 114 (29.7 percent) are among 25 to 35 years old, 137 (35.7 percent) are among 35 to 45 years old, 113 (34.6 percent) are 45 years old and higher. Data shows that the most age mean consists of the 35 to 45 years old age group, and the least age mean is related to 25 to 35 years old.

Table (3): Frequency and percentage distribution of the participants based on education

Education / Number	Observed frequency	Observed percentage
High school degree and lower	99	25.8
Associates degree	88	22.9
Bachelor's degree	104	27.1
Masters and Ph.D.	93	24.2
Total	384	100

Based on the above table, of the 384 of the total sample, 99 (25.8 percent) have high school degree and lower, 88 (22.9 percent) with associates degree, 104 (27.1 percent) with Bachelor's degree and 93 (24.2 percent) with Master's degree and higher. The results show that Bachelor degree holders consist the most sample volume, and holders of associate's degree consist the least sample volume.

The development of scale reliability and validity of the research

Firstly in order to evaluate fitness and the development of the scale, reliability and validity of the conceptual model, some main scales to process the model SMART PLS software was used, of which the results are as follows:

Table (4): Fitness indicators (validity and reliability)

Structures (Latent variables)	Convergent validity	(Composite reliability)	Determination Coefficient	Cronbach's alpha
Operational application	0.654	0.824	0.323	0.823
Total quality management aspects	0.721	0.882	-	0.886
Risk management process	0.664	0.894	0.490	0.748

Index Type	Description
Cronbach's Alpha	Factor that is useable in internal consistency reliability assessment models reflection. Amount of this coefficient; varies from 0 to 1 for which amounts greater than 0.70 is acceptable and amounts less than 0.60 are evaluated as unsuitable (Hanafi zadeh and Zare Ravasan, 2012).
Dielon-Goldstein ρ : reliability measurement with pls method	Since Chronbach's alpha presents a stricter estimate of internal consistency reliability of latent variables (alpha), in pls path models another version called composite reliability is used. When the Dielon-Goldstein ρ id greater than 0.70, that block is one dimensional (Azar et al. 2012).
Convergent validity (AVE):	Convergent validity means that the reagents set, explain the basic structure. Fornel and Larker (1981) propose usage of average variance extracted as a measure for convergent validity. Least amount of AVE, 0.5 indicates sufficient credit convergence, i.e. that a latent variable can determine more than half of the reagents dispersion (Hanafizadeh and Zare Ravasan, 2012).
Determination Coefficient r^2	r^2 amounts equal to 0.67, 0.33, and 0.19 in pls path models are respectively described as significant, average, and weak (Azar et al., 2012).

According to the obtained results from SMART PLS software output, which are shown in the above table and needed amounts descriptions in the next table, all the obtained indexes confirm all the obtained indexes of model process. Thus we conclude that the model has suitable fitting. Therefore the final model was successful in describing the relationships between the questions suitably.

Conclusion

This study with the goal of providing a pattern to evaluate total quality management aspects influence on operation through risk management moderating role in Iran's automobile industry showed that identified aspects for total quality management and its relationship with operation application through risk management process in Iran's automobile industry was confirmed. Also before, Chalova-Mora et al. (2014), Javid Tareq and Yarkhan (2011), Paul (1995), Dove et al. (1999), and Shahin and Dabestani (2011) achieved similar conclusions. And also Ahire et al. (1996) achieved a similar conclusion in their study on the U.S car manufacturing companies. Since total quality management aspects has a direct and positive effect on operation application and risk management process moderates total quality management aspects influence, thus it is proposed:

1. Manager's commitment as one of the important variables of total quality management aspects in total quality management application in organization.
2. Customer rights observation and total customer relationship application in order for organization strategies getting closer to customer needs.
3. Service distributors' operation evaluation and choosing distributors with more benefits to the company.
4. In order for the organization to better focus and make relationships with customers it shall be kept in mind that the customers are the only ones that know the organization better than us. If they are asked right, they have a lot to say about marketing efficiency and effectiveness, sales, and services that can directly impose organization management.
5. Organization benchmarking from successful opponents in order to used valid methodologies in accordance with benefits and better characteristic of the rivals.
6. Designing and establishing training development offices with the goal of training quality improvement and providing needed human resources with regards to training development.

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