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Total Quality Management: A Source of Competitive Advantage in Manufacturing Companies

Azadeh Shahbeiki
Student, Department of Management, Birjand Branch, Isalamic Azad University, Birjand, Iran
Hossein Hakimpour
Department of Management, Birjand Branch, Isalamic Azad University, Birjand, Iran
Assistant Professor, Department of Management, Islamic Azad University, Birjand Branch, Iran

Abstract:
This study investigates the impact of Total Quality Management (TQM) on Competitive Advantage (CA) in manufacturing companies in Iran. It focuses on five TQM principles including Top Management Commitment, Training and Education, Employee Involvement, Customer Focus and Continuous Improvement, to evaluate its impact on competitive advantage. The study uses a sample of 132 managers of manufacturing companies. The study employed a survey design by using questionnaire as the data collection instruments. Simple random sampling technique has been used. The results indicated that TQM has a significant impact on competitive advantage. In addition, the findings revealed that among TQM principles, Top Management Commitment and Employee Involvement had a significant impact on competitive advantage.

Keywords: *Total quality management, competitive advantage, information technology*

1. Introduction

Increased global competition, forces organizations to produce high quality products and continuously improve themselves to survive (Manders, 2016). Companies pay more attention to quality and implement quality management systems to increase organizational performance (Yildirim, 2012). Firms competing on quality pursue an operational strategy that controls quality of the product/service and seeks continuous improvement (Juran, 1992). Moreover, Competitive environments strongly influenced by changes in the market and new production technologies, respectively. These changes are leading manufacturing companies to move from traditional industrial systems to postindustrial systems that lead to higher quality, faster and timelier deliveries and introduction of new products. In fact, these changes are primary sources of CA(Skinner, 1986).

2. Literature Review

2.1. Total Quality Management

Total quality management is an approach which focuses on improving the organization's effectiveness, efficiency and responsiveness to customers' and other stakeholders' needs by actively harnessing people's skills and competencies in the pursuit of achieving sustained improvements to organizational performance (Porter & Tanner, 2012). Different scholars have given various definitions of TQM. Deming (1982), the pioneer in quality management, defined it as “management methods used to enhance quality and productivity in organizations, particularly business”. In addition, TQM can be defined as “a set of beliefs and principles that portrays the basis of a consistently growing organization. It is the application of quantitative methods and human resources to improve all the processes within an organization and exceed the customer needs now and in the future” (Addae-Korankye, 2013).

To meet the challenges of the new global environment, companies have started considering quality as an integral part of their strategic business plans. When quality improvement investments lead to better financial performance, TQM becomes a viable competitive strategy. In order to capture the multidimensional nature of performance measures, production performance is manifested by production effectiveness and production efficiency (Agus and Hassan, 2011). According to Deming (1982), TQM would generate improved products and services, reduced costs, more satisfied customers and employees and improved bottom line financial performance.

There are several important principles of TQM, which offered as requirements to remain competitive in providing products and services. Among the key principles of TQM, this study focuses on top management commitment, training and education, employee involvement, customer focus, and continuous improvement, to evaluate its relationship with CA dimensions.

2.2. Competitive Advantage

The secret of the survival and success of organizations in today's competitive environment is to create and maintain a sustainable competitive advantage. CA is the ability of an organization to produce goods or services more effectively than competitors do, thereby outperforming them (Addae-Korankye, 2013). According to Economou & Chatzikonstantinou (2009), in the current extra challenging economic environment, it is rather acceptable among firms and organizations that quality improvements consider to be a fundamental source of achieving competitive advantage and prevailing over their competitors. Companies compete based on one of the four competitive priorities including quality, cost, delivery, and flexibility.

Competitive priorities are "the dimensions that a firm's production system must possess to support the demands of the markets in which the firm wishes to compete (Awwad, et al., 2008). The competitive priorities of Hayes and Wheelwright (1984), including quality, cost, delivery, and flexibility are adopted in this research.

3. The Conceptual Model and Hypotheses

Figure 1 shows the conceptual model of the research. TQM principles including top management commitment, training and education, employee involvement, customer focus and continuous improvement are considered in order to examine their impact on CA dimensions including quality, cost, delivery time, and flexibility.

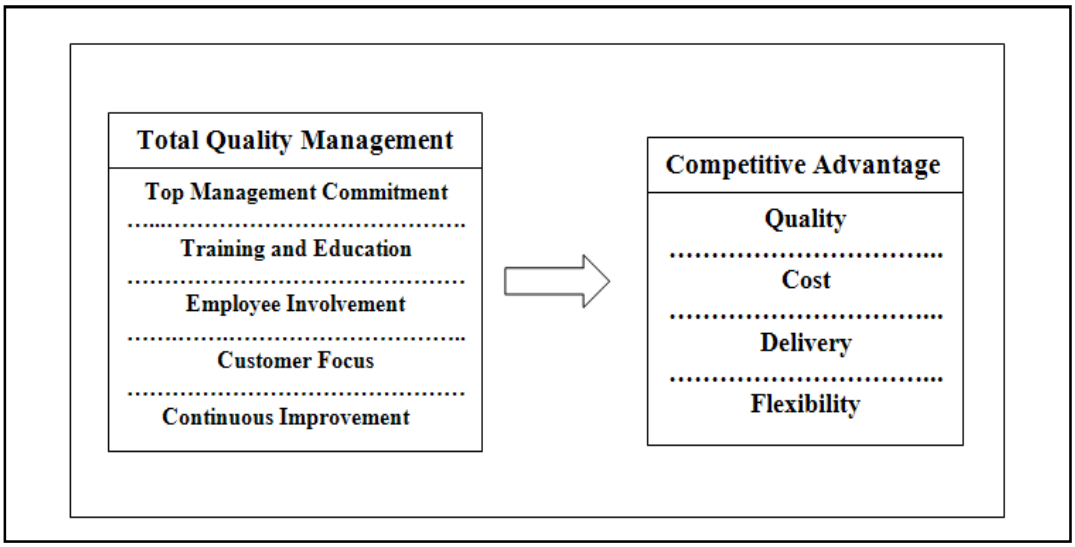

Figure 1: Research Model

3.1. Total Quality Management and Competitive Advantage

According to Reed et al. (2000), there is agreement among researchers (Crosby, Deming, Feigenbaum, Ishikawa, and Juran) that the purpose of quality management is to reduce costs and improve customer satisfaction. This idea fit closely with the market-based view of competitive advantage arising from a superior cost structure or being able to differentiate products in a way that adds value for customers.

Based on TQM philosophy, CA "can be complementary characterized by sustainability, due to the fact that the key processes of a TQM approach can also be considered as the firm's valuable intangible resources that could not be easily imitated by competitors" (Economou &Chatzikonstantinou, 2009). Therefore, this study suggests that TQM has a positive effect on CA. First hypothesis follows earlier studies that examine the relationship between TQM and CA.

- **H_1**: Total quality management has a significant positive impact on competitive advantage

Sub-hypotheses, which examine TQM principles separately, are as follows;

- **H_{1-1}**: Top management commitment has a significant positive impact on competitive advantage
- **H_{1-2}**: Customer focus has a significant positive impact on competitive advantage
- **H_{1-3}**: Employee involvement has a significant positive impact on competitive advantage
- **H_{1-4}**: Training and education has a significant positive impact on competitive advantage
- **H_{1-5}**: Continuous improvement has a significant positive impact on competitive advantage

4. Research Methodology

The purpose of the research is to investigate the impact of TQM on CA in manufacturing companies in South Khorasan, Iran. The current study, in terms of practical purpose, and methods is a descriptive survey. The population of the study includes manufacturing companies in South Khorasan, Iran. The sample size was determined as 132 managers using Cochran formula.

Simple random sampling technique has been used. The study employed a survey design by using two structured questionnaires as the data collection instrument. There were two main categories of questions; the first set was demographic in nature, while the second set contained three questionnaires including Mittal et al. (2011) TQM questionnaire and Khoshsima (2012) CA questionnaire, and Martinez-Lorente et al. (2004) information technology questionnaire.

Bartlett's test of sphericityand the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy have beenused. The results value of Bartlett's test of sphericity is significant ($p<0.001$, $p=0.000$). In addition, the Kaiser-Meyer-Olkin measure of sampling is 0.813, which is greater than 0.6 and within the required range. Considering that, the KMO value of 0.70 and above indicates strong partial correlation and is suitable for factor analysis. All variables loading value are higher than 0.50. Therefore, these values indicate that they are highly interrelated with each other.

The reliability analysis was conducted using Cronbach's alpha coefficient as well as composite reliability. Cronbach's alpha and composite reliability was 0.9191 and 0.898 for TQM questionnaire, 0.9190 and 0.875 for CA questionnaire respectively, which are at the appropriate level.

The respondents were asked to indicate their responses to the questions with descriptive statements using a 5-point Likert scale (range, 1 = very low to 5 = strongly high). 107 questionnaires were returned, and among them 5 questionnaires were found unfit or incomplete for the analysis. Therefore, 102 questionnaires were considered as the study sample.

5. Findings and Discussion

This study tries to examine the impact of TQM on CA in manufacturing companies in South Khorasan, Iran. For this purpose, TQM principles including top management commitment, training and education, employee involvement, customer focus and continuous improvement were selected to evaluate its impact on CA. In order to evaluate the relationship between variables, Partial Least Square (PLS) analysis and Structural Equation Modeling (SEM) techniques were adopted. Smart PLS which is the prominent software for partial least square was used.

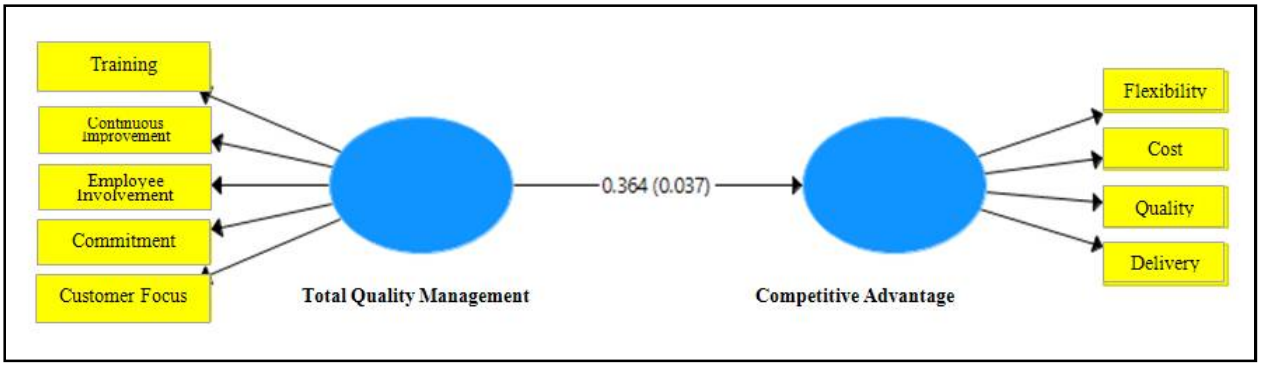

Figure 2: The structural equation modeling of the first main hypothesis

H_1: TQM has a significant positive impact on Competitive advantage

Regarding the results of the data analysis, the significance level of the test is less than 0.05 ($p=0.037 <0.05$) as shown in the above-mentioned model (Fig. 2), therefore, it can be said that TQM had significant impact on CA. Values found in Table 1, show that the goodness of fit for the structural equation modeling is acceptable and appropriate and the overall hypothesized model has a good fit. Therefore, the results are reliable.

Index	Value	Acceptable Value
SRMR	0.062	Less than 0.10 or 0.08
AVE Competitive Advantage	0.321	More than 0.3
AVE Total Quality Management	0.256	More than 0.3
R Square	0.214	-

Table 1: CFI value of the first main hypothesis

In order to investigate the sub-hypotheses, the following model implemented in Smart PLS software:

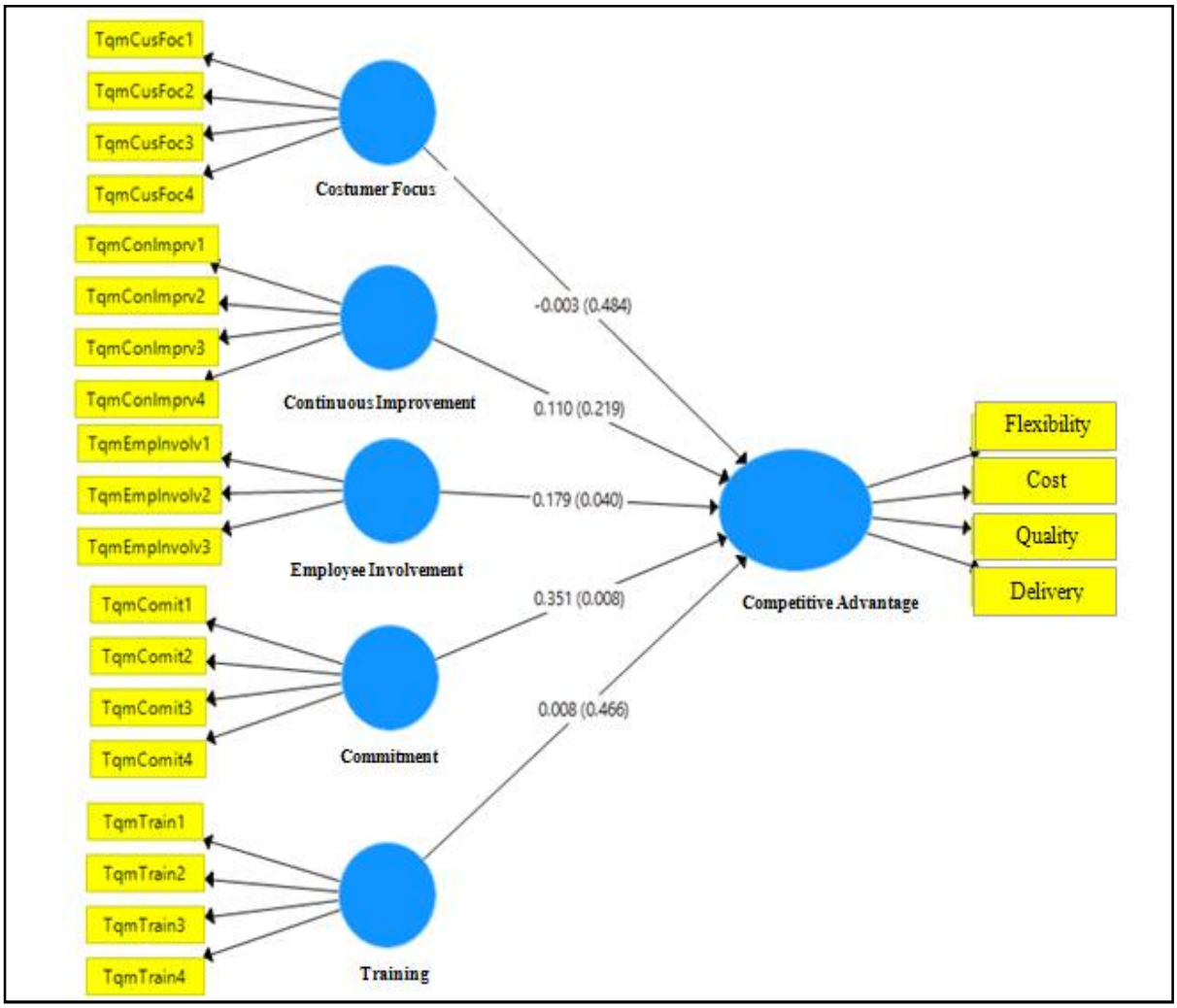

Figure 3: The structural model of sub-hypotheses

Based on the results of the data analysis, the significance level of the $H_{1\text{-}1}$ and $H_{1\text{-}3}$ are less than 0.05 ($p = 0.037 < 0.05$) as shown in above model (Fig. 3). Therefore, from among TQM variables, top management commitment and employee involvement had significant impact on CA.

Values found in Table 2, show that the goodness of fit for the structural equation modeling of all the indexes is acceptable and appropriate and the overall hypothesized model has a good fit. Therefore, the results are reliable.

Index	Value	Recommended values for good fit
SRMR	0.091	Less than 0.10 or 0.08
AVE Training	0.527	More than 0.3
AVE Top Management Commitment	0.447	More than 0.3
AVE Customer Focus	0.677	More than 0.3
AVE Employee Involvement	0.440	More than 0.3
AVE Continuous Improvement	0.581	More than 0.3
AVE Competitive Advantage	0.321	More than 0.3
R Square	0.344	-

Table 2: CFI value of sub-hypotheses

6. Discussion and Conclusion

The purpose of the present study was to investigate the effectiveness of core principles of total quality management on competitive advantage in manufacturing companies in SouthKhorasan, Iran. The results obtained from the analysis of the first hypothesis are consistent with the results of other studies (Addae-Korankye, 2013; Al-Rawashdeh, 2014; Cornelison, 2013; Yildrim, 2012; Zentner, 2011), that indicates the high external validity of this test. Therefore, considering the research background and the consistency of the results with previous studies, undoubtedly, TQM has a positive and significant impact on competitive advantage.

As mentioned earlier, TQM is a quality-oriented approach. With increasing global competition, the importance of quality for survival has become an important challenge. Improving the quality of products and services can lead to lower production costs, thereby increasing profits, reducing product prices, and differentiation. According to Economou & Chatzikonstantinou (2009)(2009), product quality is a critical factor, for the enterprise's enhanced market share and the consequent improved profitability rate. The other essential factor in this case is the implementation of a TQM strategy based on carefully designed processes that could eliminate faults and errors, reduce waste and consequently, success in achieving improved performance. He further stated, "raises the complementary issue of achieving customer satisfaction and loyalty, which can become the basis of a strong competitive advantage, able to sustain increased market share and advanced profitability rates". Organizations are competing based on quality and quality is an important part of the competitive advantage. Total quality management can be an effective way to form or support a competitive global strategy.
Moreover, the findings revealed that from among five principles of TQM, top management commitment and employee involvement had a significant impact on achieving competitive advantage.
Generally, the findings of the research support evidences by researchers regarding the impact of total quality management, on competitive advantage. The results of the study demonstrate that TQM is a critical factor in creating CA, and it could be a source of competitive advantage if properly implemented. Therefore, manufacturing companies should emphasize greater attention and commitment to total quality management processes especially at the level of top management.

7. References

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