A Survey on the Effect of the Establishment of ISO 9001 on Achieving Competitive Advantage in Firms Manufacturing Products Included in Mandatory Standards Act of Guilan Province

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Abstract

ISO 9001 standard has been established in firms manufacturing products included in Mandatory Standard Act. Companies having this certificate are willing to know whether applying requirements of ISO9001, considering its costs of establishment, registration and maintenance, can improve business and operational performances to achieve competitive advantage. Thus, this paper primarily aims to investigate the effect of ISO9001 establishment on achieving competitive advantage in mentioned firms and companies. In terms of research objectives, the present paper is of applied type. Data are collected through descriptive method and the paper is considered as a field study. The population is composed of firms manufacturing products included in the Act of Mandatory Standards of Guilan province which have gained ISO9001 certificate. Sample size was determined to be 73 firms, using Kookran formula. Questionnaire was used as the main data collection tool. Reliability of the questionnaire (Cronbach α coefficient) was 0.87. SPSS-aided Pierson correlation coefficient was applied to test the hypotheses. Findings indicated that establishment of ISO9001 is effective on achieving competitive advantage.

Keywords: ISO9001, competitive advantage, operational performance, business performance, Guilan Province

Introduction

The turbulent and varying environments of firms, which are characterized by market globalization, enhancement of consumers’ level of expectations and awareness, varying needs of customers and an increase in competition in products market, compels them to seek improvements in their performance permanently. In this competition area firms try to gain advantages not only to create value, but also to use them to be more successful in capturing customers than other rivals. Accordingly, competitive advantage goes to those firms which focus on creating value and being customer-oriented to improve their business and operational performance. Based on their experiences firms have found that it is not useful to only employ new tools and technologies but they have to use new managerial methods and approaches. ISO9001 standard, which displays requirements of the Quality Management System (QMS), focuses on the effectiveness of QMS in satisfying customers’ demands.

As ISO9001 has been established in firms since several years ago, it is rather important for them to find the answer to this question: whether applying requirements of ISO9001, considering its costs of establishment, registration and maintenance, can improve business and operational performances to achieve competitive advantage. The present paper tries to investigate the effect of ISO9001 establishment on achieving competitive advantage while considering the main principles of competitive advantage and
approaches to establish ISO9001. Therefore, firms manufacturing products included in Mandatory Standards Act of Guilan Province are studied here.

**Literature Review**

**Competitive Advantage**

**Definition of Competitive Advantage**

Competitive advantage involves a set of factors or capabilities which always enable the firm to show better performance than its rivals. Another definition defines competitive advantage as a factor or combination of factors that make the organization more successful than other rivals in a competitive environment and competitors are not able to imitate the organization easily (Abbas Zadeh, 2009). Based on another definition competitive advantage is the excess attractiveness of the firm's offers in customers’ view (in comparison with rivals). Also, it is the difference in characteristics of aspects of each firm which enables it to serves customers better than rivals. Some define competitive advantage as values provided to customers by the firm, so that these values are higher than customer costs.

Above definitions of competitive advantage (and also other available definitions) demonstrate that the concept of competitive advantage is in a direct relationship with values considered by customers so that, in a comparative spectrum, the more closer values provided by a firm are to those considered by the customer, the more dominant is the firm on several competitive scales (in comparison with rivals) (KhodadadHoseini, 2005).

**Origins of Competitive Advantage**

An institute may try to create competitive advantage based on local capabilities and resources or advantages and profits gained from the network of institutes. Thus, competitive advantage has two identifies origins: the institute and the network (Alavi Shad and Sanaye'ei, 2006).

Institute: sometimes an institute applies its local resources to create competitive advantage and uses required ones (human resources, raw material, customer-orienting processes, etc) to obtain an optimum combination of these. Actively employing the optimum combination by the firm leads to creation of effective capability for it. Requirements of the new competitive world compel firms to develop an innovative knowledge locally and use it as the basis for its activities. Through establishing a purposeful convergence between the innovative knowledge and local capabilities institutes can obtain a series of main competences critical for achieving competitive advantage. In fact, institutes can create this advantage through their main knowledge-base competence.

Network: an institute may achieve some levels of competitive advantage based on local capabilities and resources. But it must be noticed that institute can reach higher levels of competitive advantage of they work in a network and transfer their thoughts and actions from inside to outside of the organization. Working and acting in a network institutes try to identify environmental opportunities and base the competitive advantage on them. Indeed, the competitive advantage not only stems form local resources but also it originates from the network which is composed of several interacting institutes (Alavi Shad, Sanaye’ei, 2006).

**Strategic Abilities of Competitive Advantage**

Resources of competitive advantage must be sought in its strategic abilities. Not only have these abilities enabled the organization to consolidate its position, but also have helped it to achieve dominance on others. Lewis et al (1993) classify these abilities as follows (Alavi Shad and Sanaye’ei, 2006):

- **Economic Abilities**: such as physical properties, market share, geographical position, financial resources, economy per production unit, registration right, and the reputation of the trademark.
- **Technological Abilities**: such as implicit skill in products/services production, physical plants and facilities and individual experience and skills.
- **Human Abilities**: such as leadership style, attitudes and behavior of organization's members.
- **Organizational Abilities**: such as structure, systems and norms which direct and coordinate the behavior of organizational members to move toward efficiency.
- **Managerial Abilities**: such as the ability to develop, coordinate and change technological, organizational, human and economic abilities.

**Operational and Business Performances**

Passing through various eras of product-orienting and market-orienting along with the advent of meta-industrial era, in which knowledge and information form the base of human movements, has face firms and organization with new challenges. Accordingly, competitive advantage goes to those firms that focus on value creation and customer-orientation and try to improve their business and operational performance.

Operational performance is a type of performance liked with organizations’ internal operations such as productivity, product quality and customer satisfactions (Feng, ,Terziiovski, Samson, 2007). In other
words, operational performance is the measured performance of a firm versus standard or determined indicators of effectiveness, efficiency and environmental responsibility such as cycle time, efficiency, waste reduction and following the rules and regulations (http://www.businessdictionary.com/definition/operational-performance.htm)

Business performance is an enlarged domain of performance linked to financial and marketing issues such as sales growth, profitability and market share (Feng et al., 2007).

A Competitive advantage will be revealed in better operating performance as expressed in such measures as lower defect rates and a reduced cost of quality. It will be demonstrated by on-time delivery and customer satisfaction, and involve productivity improvements, for as Garvin (1988), maintains, quality and productivity are related. More time would be devoted to manufacturing acceptable products; there would be less rework, less scrap and fewer wasted materials. Quality management as well as operations theories suggest that better operating performance should lead to another component of competitive advantage, better business performance. With lower defect rates and on-time delivery, sales should grow because new markets are created and customer retention is high (Naveh and Marcus, 2005).

**International Standard of ISO 9000**

The International Standards Organizations in Geneva established the ISO 9000 standard in 1987, although the origin of this standard traces back to American (MIL-Q-9858A-1960SandMIL-I 45208A) and British (BS 5750) standards. Up to the year 2000, around 100,000 organizations had ISO9000 certificate globally and over 100 countries had it accepted. Managerial standards such as ISO9000 are a subset of a wider range of Voluntary Management Practices referred to as Administrative Innovations. ISO9000 requires firms to evaluate and classify themselves internally through certain measures and consider repetitive, current procedures and habits of designing and planning, producing, distributing, delivering and logistics. Quality standards such as ISO9000 have always grown and been corrected during the time and it is assumed that they present a competitive factor in most industries. Since, however, ISO9000 is a public knowledge and implementation of practical objectives aims to increase homogeneity among organization, it can be discussed whether ISO9000 forms a competitive factor (Naveh and Marcus, 2000).

ISO9000 is developed based on management basic principles. Conceptual and empirical foundations are well established to create a link between improved quality and business performance based on various theories. ISO9000 requires the firm to design procedures to ensure that quality is continuously measured and proper modifications are adopted when a deficiency occurs. Therefore, deficiency rate must be reduced, should be found and modified in the proper time period and less scrap and rework must be available in the production process (Yeung et al., 2009).

**ISO 9001**

ISO9000 standards are among the most popular and valid quality standards. These are developed to aid organization, with different size and types, in establishing and implementing quality management systems. In this series, ISO9001 specifies the requirements of quality management system for situations in which an organization has to demonstrate its ability in providing products that meet customers' needs and legal requirements, and where its main objective is to enhance customer satisfaction.

**Approaches to Use ISO9001**

In the present paper, based on "Feng", "Terziovski" and "Samson", approaches to use ISO9001 include: planning, organizational commitment and implementing procedures.

**Planning**

Many organizations especially small business fail to obtain full benefits from ISO 9000 certification because of an inadequate or outdated implementation plan. The literature is consistent in finding that planning is considered to be vital in the successful implementation of ISO 9001. Thus, ISO 9000 certification requires a short-term plan for the implementation process and a long-term plan for sustaining the effort. These plans should be integrated into overall business planning to allow organizations to apply ISO management systems effectively. This includes top management commitment, education and training, documentation and organized resources (Feng et al., 2007).

**Commitment**

The ISO 9000 series standard refers specifically to the need for commitment from all organizational members at all stages of the process (ISO, 2000). The importance of organizational commitment is generally accepted by management theorists and practitioners. Meyer and Allen (1997) propose three factors of the employees' relations with the organizational commitment: affective, continuance and normative. Affective
commitment refers to emotional attachment and involvement of individuals to organization. Continuance commitment is consideration of costs associated with leaving or the rewards for staying with the organization. Normative commitment is associated with the feelings of obligation to remain in employment. Organizational commitment involves a range of people within the organization such as top management, work unit employees and organization itself. Many studies conclude that organizational commitment is related to valuable outcomes for both the employee and employer, such as increased employee morale, reduced stress and improved productivity.

Brown and van der Wiele (1998) found that lack of commitment from employees and managers is the most frequently mentioned problem faced by Small to Medium Enterprises (SMEs) in implementing ISO certification. They also found that training of employees and managers is one of the primary methods of dealing with problems faced by organizations during the development of quality management systems. Convincing both managers and employees of the future benefits arising from certification and dealing with a general level of indifference was reported as being a major challenge (Feng et al., 2007).

Implementing Procedures
Implementing procedure is a specified way of accomplishing an activity or a process. According to Zink (1994) and Briscoe et al., (2005) many SMEs have experienced considerable problems with the introduction, development and measurement of ISO 9001 quality management systems. Some studies found that SMEs have more difficulties in practicing quality assurance. Lee and Palmer (1999) also noted that not only the difficult to keep documentation updated, but it is also a change to monitor employees’ day-to-day adherence to the standards. Therefore, a large amount of managerial time and effort is required to maintain the ISO 9000 certification. These studies concluded that many SMEs do not realise the full strategic importance of quality. Although some SMEs experience disadvantages with ISO 9000 certification, there is evidence from the literature that ISO 9001 quality systems have been successfully implemented in many SME sectors particularly manufacturing (Feng et al., 2007).

Research Background
A research, titled "Relationship of ISO 9001:2000 quality system certification with operational and business performance", was done by Feng, Terziovski and Samson (2007) the main objective of which was to explore the relationship between ISO9000 certification and organizational performance by developing an ISO9000 relationship model. Results indicated that implementation of ISO9000 and its approaches (planning, commitment, implementing procedures) have a positive and significant effect on operational performance. Also, the effect of commitment and implementing procedures on business performance was positive and significant, but planning had a positive weak effect on business performance. Generally, and considering accomplished statistical tests, the effect of these approaches was weaker on business than operational performance and it was more obvious between planning and business performance. A study, titled "the impact of ISO9000 quality management systems on manufacturing", was done by koc (2006) the goal of which was to identify variables explaining the popularity of ISO9000 quality management system, particularly from production viewpoint. It also discussed and investigated the utilization of ISO9000 quality management system for SMEs while simultaneously provided experience-based data useful for industrial strategy makers.

Results of this research showed that there is a propriety and coordination between ISO9000 operations, production performance, competitive advantages and firm’s performance. Firms production parameters of which improve through ISO9000 operations improve the value provided to the customer by competitive advantages this leads to an enhancement in firm’s performance. Moreover, analytical findings demonstrate that improvement in production internal competences, by providing better values to customers, results in an increase in customer demand which in turn improves the firm’s performance. A study, titled "Does ISO 9000 certification affect the dimensions of quality used for competitive advantage?", was done by Withers and Ebrahimpour (2000) in which 11 European firms having ISO9000 certification were investigated to determine whether (and how does) ISO9000 certification affect quality aspects related to their success. Findings indicted that quality is improved as a result of ISO9000 certification. Besides, it is also demonstrated that reasons for seeking and appealing this certification can affect the degree to which quality is improved.

A research was accomplished by Akhavan (2002) on "evaluation of effectiveness of ISO9000 series-based quality management systems establishment in Iran". This research focused on operational and business processes and aimed to investigate results of establishing such systems emphasizing operational and customer relationship (business) processes.
One of the most interesting finding of this study was the effectiveness of establishing such systems in documentation and regulation indicators, developing quality records, customer-directedness in organizations, controlling processes of planning, developing, and preventive maintenance.

Conceptual Framework of the Research

The following conceptual model (for the present research) is adopted from a model presented by Feng et al., (2007) in an article on "Relationship of ISO 9001:2000 quality system certification with operational and business performance, a survey in Australia and New Zealand-based manufacturing and service companies".

Figure 1. The conceptual model for the effect of ISO9001 establishment on achieving competitive advantage

In the present research paper achieving competitive advantage is considered as the main dependent variable and establishment of ISO9001 certification as the primary independent variable. According to Naveh and Marcus (2005) improvement of operational performance and improvement of business performance are components of achieving competitive advantage. Besides, Feng et al., (2007) demonstrated that approaches of ISO9001 establishment are planning, commitment and implementing procedures which include following variables:

According to Feng et al., (2007), variables of operational performance improvement are costs reduction and increasing customer satisfaction, and those for business performance improvement include market share increase and improving the intellectual image.

Variables of planning include investment, documentation and education; variables of commitment are top management commitment, Middle management commitment and Worker's commitment; and variables of implementing procedures include following standard procedures, periodic audits and Implementation of corrective action.

The following hypotheses are studied in the present paper:

The Main Hypothesis: There is a relationship between ISO9001 certification establishment and achieving competitive advantage.

Side Hypotheses
1. There is a relationship between planning and operational performance improvement.
2. There is a relationship between commitment and operational performance improvement.
3. There is a relationship between implementing procedures and operational performance improvement.
4. There is a relationship between planning and business performance improvement.
5. There is a relationship between commitment and business performance improvement.
6. There is a relationship between implementing procedures and business performance improvement.

Research Methodology

The present paper is an applied study in which analytical data collection method is used and it is considered to be a field study. The main objective of this paper is to specify the correlation in order to determine whether there is a relationship between ISO9001 certification establishment and achieving competitive advantage. Here, Library and filed methods are used to gather data. Data and information required for hypotheses testing were collected using questionnaire (the main data collection tool). The validity was recognized using professionals' views. Cronbach Alpha of the questionnaire was also calculated to determine its reliability. The obtained value was 87.5% which is considered acceptable statistically.

The population was composed of firms manufacturing products included in the Act of Mandatory Standards (Also having ISO9001 certification) in Guilan province the number of which was totally 82.
Besides, considering the volume of population and research topic, sample size was estimated using proper formula (Kookran formula) as follows:

\[ n = \frac{NZ^2\alpha/2 \times p(1-p)}{\varepsilon^2(N-1) + Z^2\alpha/2 \times p(1-p)} \]

\[ n = \frac{82 \times 1/96^2 \times 0.5 \times (1-0.5)}{0.04^2 \times 81 + 1/96^2 \times 0.5 \times (1-0.5)} \approx 72/25 \approx 73 \]

Based on this formula sample size in estimated to be 73 thus the researcher distributed questionnaire among firms and collected 75 fulfilled ones.

**Introduction of Statistical Techniques to Analyze Data**

In fact in the present paper hypotheses were tested by correlation coefficient and with the help of SPSS statistical software. Since, here, the main goal is to explore the relationship between ISO9001 certification establishment and achieving competitive advantage, correlation coefficient indicator is used which is a mathematical indicator and describes the direction and the magnitude of the relationship between the two variables. Besides, since data is collected spatially then Pierson indicator of correlation coefficient is employed.

**Research Findings**

Based on data analysis and statistical tests hypotheses were investigated and results are as follows:

A) First Side Hypothesis: There is a relationship between planning and operational performance improvement.

According to results it is deduced that the independent variable of "planning" has a relationship of 58% with the dependent variable of operational performance improvement. This means that these two side variables have a positive and significant relationship with each other. Also, the effect size of "planning" equals 0.336% indicating 33.6% of changes of the variable of operational performance improvement in studied firms are influenced by the predictor variable of planning, in respondents' viewpoint.

B) Second Side Hypothesis: There is a relationship between commitment and operational performance improvement.

According to results it is deduced that the independent variable of "commitment" has a relationship of 64.4% with the dependent variable of operational performance improvement. This means that these two side variables have a positive and significant relationship with each other. Also, the effect size of "commitment" equals 0.415% indicating 41.5% of changes of the variable of operational performance improvement in studied firms are influenced by the predictor variable of commitment, in respondents' viewpoint.

C) Third Side Hypothesis: There is a relationship between implementing procedures and operational performance improvement.

According to results it is deduced that the independent variable of "implementing procedures" has a relationship of 69.9% with the dependent variable of operational performance improvement. This means that these two side variables have a positive and significant relationship with each other. Also, the effect size of "implementing procedures" equals 0.488% indicating 48.8% of changes of the variable of operational performance improvement in studied firms are influenced by the predictor variable of implementing procedures, in respondents' viewpoint.

D) Fourth Side Hypothesis: There is a relationship between planning and business performance improvement.

According to results it is deduced that the independent variable of "planning" has a high relationship of 76.9% with the dependent variable of business performance improvement. This means that these two side variables have a positive and significant relationship with each other. Also, the effect size of "planning" equals 0.591% indicating 59.1% of changes of the variable of business performance improvement in studied firms are influenced by the predictor variable of planning, in respondents' viewpoint.

E) Fifth Side Hypothesis: There is a relationship between commitment and business performance improvement.

According to results it is deduced that the independent variable of "commitment" has a relationship of 67% with the dependent variable of business performance improvement. This means that these two side variables have a positive and significant relationship with each other. Also, the effect size of "commitment" equals
0.449% indicating 44.9% of changes of the variable of business performance improvement in studied firms are influenced by the predictor variable of commitment, in respondents' viewpoint.

F) Sixth Side Hypothesis: There is a relationship between implementing procedures and business performance improvement.

According to results it is deduced that the independent variable of "implementing procedures" has a relationship of 71.4% with the dependent variable of business performance improvement. This means that these two side variables have a positive and significant relationship with each other. Also, the effect size of "implementing procedures" equals 0.509% indicating 50.9% of changes of the variable of business performance improvement in studied firms are influenced by the predictor variable of implementing procedures, in respondents' viewpoint.

The Main Hypothesis: There is a relationship between ISO9001 certification establishment and achieving competitive advantage.

According to results it is deduced that the independent variable of "ISO9001 certification establishment" has a high relationship of 78.2% with the dependent variable of "achieving competitive advantage. This means that these two main variables have a positive and significant relationship with each other. Also, the effect size of "ISO9001 certification establishment" equals 0.611% indicating 61.1% of changes of the variable of achieving competitive advantage in studied firms are influenced by the predictor variable of ISO9001 certification establishment, in respondents' viewpoint.

Since coefficients of all independent variables have a positive value then there is a direct relationship between ISO9001 certification establishment and achieving competitive advantage, and this consistent with results of hypotheses testing.

Moreover, according to results, 61% of changes in the dependent variable (achieving competitive advantage) are explained by components of ISO9001 establishment and the remaining 39% is influenced by other variables and factors.

Table 1 shows the relationship magnitude between dependent and independent variables and Table 2 summarizes the regression of predictor and criterion variables.

### Table 1. The relationship between dependent and independent variables

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variable</th>
<th>Correlation coefficient</th>
<th>Sig</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO9001 establishment</td>
<td>Achieving competitive advantage</td>
<td>0.782</td>
<td>0.000</td>
<td>99%</td>
</tr>
<tr>
<td>Planning</td>
<td>Operational performance</td>
<td>0.58</td>
<td>0.000</td>
<td>99%</td>
</tr>
<tr>
<td>Commitment</td>
<td>Performance</td>
<td>0.644</td>
<td>0.000</td>
<td>99%</td>
</tr>
<tr>
<td>Implementing procedures</td>
<td>Improvement</td>
<td>0.699</td>
<td>0.000</td>
<td>99%</td>
</tr>
<tr>
<td>Planning</td>
<td>Business performance</td>
<td>0.769</td>
<td>0.000</td>
<td>99%</td>
</tr>
<tr>
<td>Commitment</td>
<td>Performance</td>
<td>0.67</td>
<td>0.000</td>
<td>99%</td>
</tr>
<tr>
<td>Implementing procedures</td>
<td>Improvement</td>
<td>0.714</td>
<td>0.000</td>
<td>99%</td>
</tr>
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</table>

### Table 2. Regression of predictor and criterion variables

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>Criterion variable</th>
<th>Correlation coefficient square</th>
<th>Predictor variable coefficient</th>
<th>Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO9001 establishment</td>
<td>Achieving competitive advantage</td>
<td>0.611</td>
<td>0.667</td>
<td>1.729</td>
</tr>
<tr>
<td>Planning</td>
<td>Operational performance</td>
<td>0.336</td>
<td>0.310</td>
<td>2.828</td>
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<tr>
<td>Commitment</td>
<td>Performance</td>
<td>0.415</td>
<td>0.549</td>
<td>1.704</td>
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<tr>
<td>Implementing procedures</td>
<td>Improvement</td>
<td>0.488</td>
<td>0.555</td>
<td>1.902</td>
</tr>
<tr>
<td>Planning</td>
<td>Business performance</td>
<td>0.591</td>
<td>0.642</td>
<td>1.493</td>
</tr>
<tr>
<td>Commitment</td>
<td>Performance</td>
<td>0.449</td>
<td>0.891</td>
<td>0.218</td>
</tr>
<tr>
<td>Implementing procedures</td>
<td>Improvement</td>
<td>0.509</td>
<td>0.885</td>
<td>0.603</td>
</tr>
</tbody>
</table>

**Suggestions for Future Research**

It is recommended to investigate other effective factors and variables of ISO9001 establishment on competitive advantage.

Furthermore, such studies could be accomplished in laboratories authorized and certified by Iranian Organization of Standard and Industrial Research in order to be able to explore the effect of ISO9001 establishment on achieving competitive advantage in them.
Besides, the effect of other quality management systems and techniques and international self-assessment models on achieving competitive advantage can be investigated.

References


Alavi Shad A, Sanaye’ei A, 2006. The role of customer relationship management (CRM) in achieving competitive advantage in service providing markets (case study on travel agencies). Fourth international conference on management.


