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Establishing a Logical Nexus between the Application of Total Quality Management TQM and Organizational Performance

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Abstract
In this study, there will be a testing of the strength of the relationship between TQM practice and the performance of the organization and with the use of covariates, the size of the company, the type of industry and the ISO 9000 certification status. There will be an analysis of a very large and random sample of 150 manufacturing companies in Saudi Arabia was chosen for the study. The main finding that is made here that TQM tends to have mixed results when it is covaried for company size and the type of industry involved. It was found that the relationship that exists between TQM and organizational performance is not very much affected when it is covaried for ISO 9000 certification status. The conclusion that is made in the reseas is that there are significant differences within the relationship that exists between TQM and the performance of the organization across industry sectors and various different size companies, and this is particularly of concern relating to the effect of defect rates, the warranty costs and the innovation of new products. In reference to the main implication of the findings for managers that was made here is that a typical manufacturing organization can be likely to achieve better performance when it comes to employee relations, the level of customer satisfaction, the level of operational performance and also business performance, when they apply TQM principles and practices as opposed to if they did not practice TQM.
Keyword: Total Quality Management, Organizational Performance and Innovation

Introduction

In these present times, the elevated levels of competition has provided motivation for managers that are operating in manufacturing organizations to make an evaluation of the competitive strategies as well as management practices that have been utlized by their firms in order to make improvements to the performance of all the organizational (Humble, 2002). In countries like Saudi Arabia, the workforce is starting to diminish and there seems to be a greater need to be able to sustain performance and in line with this, it is starting to become apparent that organizations are striving to be able to define, implement and sustain

TQM practices. This can be described as being a new management philosophy which it capable of integrating strategy, management practice as well as organizational outcomes in order to be able to create an efficient firm and which continuously improves and sustains performance. There would be an outline of the research objectives, the methods that would be used to collect data to achieve these research objectives. Then the methodology would be put into to action and data would be analyzed and findings would be made and outlined. There will be a testing of the strength of the relationship between TQM practice and the performance of the organization and without the use of covariates, the size of the company, the type of industry and the ISO 9000 certification status.

In many organizations, managers are simply unable to make a precise determination and an identification of the connection between the application and execution of the principles and practices of TQM and the enhanced and efficient performance of the organization. These managers do not believe that TQM really has the impact of making the practices of the organization more efficient and hence they have omitted to take into account the use of TQM principles at their organization. These managers have not been presented with the kind of evidence that would help in influencing their decision to implement TQM at their organization (Calvelage and Humble, 2002).

Purpose and Significance of the Study

It is noted here that there has been much that is talked about TQM philosophy as well as methods by quality practitioners or ``gurus'' (Juran, 1991, and Feigenbaum, 1983). However, it is surprising to know that there has not been much research that has been carried out in order to establish the link between TQM practice as well as organizational performance. There is a common rationale for a number of TQM initiatives is that belief that they will pay off sometime in the future and the owners of the companies would believe that the shareholders are able to wait that long. It has been acknowledged by Bowles & Hammond (1991) believe that it is only until a strong connection between TQM and the bottom-line is able to be made out, measured well and regularly reported to senior management, would CEO's of company take serious action. It is apparent that there simply has not been enough attention that has been given to the role of TQM in enhancing and improving the performance of the organization.

There have been numerous studies that have been carried out when it comes to making a test of the nexus between the practices of TQM as well as the performance of the organization (GAO Study, 1991) and (Powell, 1995). What can be discerned here is that these studies do not have much of what can be described as being statistical and methodological rigor and the size of the samples are not large enough. This study will address some practical and far reaching issues will be addressed. Among these include whether the practices of TQM can have an impact on the organizational and secondly, whether there is a change in the strength of the relationship between TQM practice as well as the performance of the organization changes when the relationship has been covaried for the size of the company, the type of industry as well as the ISO 9000 certification status.

Objectives of the Study

In this research, the primary objectives include to make a research of the principles of TQM, to make a research the application of the principles of TQM in improving organizational performance and to determine whether the application of TQM principles at the organization can bring a competitive advantage.

Development of Hypothesis

For this particular study, the following hypotheses have been developed and articulated:

- Hypothesis 1: The TQM practice tend to have a positive impact on the performance and level of innovation of the organization
- Hypothesis 2: The connection between TQM practice as well as the dimensions of organizational performance is fortified when covaried for company size.
- Hypothesis 3: The connection between TQM and organizational performance dimensions is fortified when covaried for industry type.
- Hypothesis 4: The relationship that is present between TQM and dimensions of organizational performance is fortified when it is covaried for ISO 9000 certification status.

Literature Review

There have been a great number of studies that have been carried out in reference to the literature concerning the link between the practices of TQM as well as the performance of the organization. There has been an empirical study pertaining to quality practices that was carried out here and this is the International Quality Study that has been carried out by Ernst & Young and also the subject of discussion by Bemowski (1991). In this project, there had been a study of the various quality practices of well over 500 automotive, computer, banking, and health care organizations within the US, Canada, Germany and Japan. What the study had concluded here was that there were approximately 3 quality management practices that had a very significant impact in relation to the performance, regardless of industry, country, or even starting positions. These are described as being process improvement methods, strategic plan deployment as well as supplier certification programs. Concerning the tone of the study, this was very managerial and it was focused on making summary of the results as opposed to presenting the data and analysis.

There had also been a study that was carried out by the US Government Accounting Office Study (GAO, 1991) and this study made an examination of the impact of formal TQM improvement strategies upon the performance of 20 US companies and what this study managed to find here was that there was a very strong relationship between the use of TQM by the company, as well as the performance of the organization. The use of TQM in U.S is related to strong customer focus,, senior management leadership, commitment to employee training, Empowerment, Involvement and Application of systematic fact finding (Terziovski and Samson, 1999).

Garvin (1991) had responded to these findings by stating that the GAO study had not been performed scientifically through the use of statistical methods and the 20 companies that were subject to the survey had not answered all of the questions. In addition to this, it can also be said that a proper test for the relationship that exists between TQM as well as the organizational performance would typically need a much larger and much more diverse

sample of companies. It is this kind of approach that will permit the researchers to test whether companies that do not practice TQM would be able to perform capably in the market place (Terziovski and Samson, 1999; Calvelage and Humble, 2002).
A very rigorous study pertaining to the connection between TQM practice as well as the organizational performance is the study that had been carried out by Powell (1995). In this study, there was an examination of TQM as being a potential source of what can be labelled as a competitive advantage. What these findings imply is that most features that are normally connected with TQM, like quality training, process improvement, and also benchmarking, do not necessarily bring about an advantage but there are certain tacit, behavioral, imperfectly imitable features that are able to produce an advantage. What can be concluded at this point is that these tacit resources and not TQM tools and techniques, are able to drive TQM success, and that organizations that are capable of acquiring them are able to outperform competitors with or without TQM (Terziovski and Samson, 1999).

TQM can be described as a kind of a philosophy which essentially embraces various concepts, methods, tools and techniques in order to be capable of forming a language that is understood and applied in the form of a business strategy at the ``top-floor'' as well as a functional strategy at the ``shop-floor.'' This approach can be said to be very helpful when it comes to helping organizations to be able to integrate business activities in leadership, people, customer focus, planning, quality assurance of processes, and information and analysis. When these activities are effectively linked together, what would happen here is that it would lead to highly sustainable world class performance in regards to customer satisfaction, employee relations, operating performance and most of all, the performance of the business (Prajogo and Sohal, 2003, Terziovski and Samson, 1999, Calvelage and Humble, 2002).

A very profound impact of TQM in respect to the organizational performance is the Australian Automotive Industry and this example will be used to demonstrate the impact of TQM on a specific manufacturing industry. In essence, this industry is said to have very clearly demonstrated that the revitalization of old manufacturing businesses can be something that is very possible and it has taken place in some firms and would likely to continue to demonstrate improvements in reference to quality and productivity. This industry authority has been convinced that the evolution of the new manufacturing culture that has been founded on the principles of Kaizen can be described as being a main reason for the enhancements and improvements that have taken place within the Australian car industry (Terziovski and Samson, 1999).

In essence, Kaizen is a Japanese word that stands for continuous improvement (Imai, 1986). There also were same kind of findings that had been reported from a large study of 1,300 manufacturing sites and this study had been carried out by the Australian Manufacturing Council (AMC Study, 1994). Within this study, there had been a very detailed analysis in reference to the approach that had been undertaken by Australian and New Zealand manufacturing organizations concerning manufacturing and quality management practices. What this study had concluded was that TQM would very likely to lead to overall improvements in terms of organizational performance (Prajogo and Sohal, 2003)

A very complete empirical study which is said to have been capable of testing the relationship between quality practice and organizational performance would be one that is said to be carried out by an academician that was said to utilize structural equation modeling in order to study 184 manufacturing firms in New Zealand. It was found that quality is a concept that had mixed results when connected to the organizational performance. When examining a number of measured direct relationships that were present between quality and business financial performance, it must be said that the results had not been significant. What is quite apparent is that the connection between quality and production/operations outcomes is very significant. Notably, the quality practice was found to have a very significant and it did have a very positive impact on performance measures that relate to process utilisation, process output, production costs, work-in-process inventory levels, and on-time delivery (Prajogo and Sohal, 2003) and (Terziovski and Samson, 1999).

When talking in terms of innovation, this could take several forms when concerning products, services, production processes and management systems. Essentially, innovation concerning products and services can be said to be connected to R&D and meeting the needs of consumers. Innovation in regards to processes relates to changes in machinery and other elements can be said to not be directly associated with employees and the main objective here would be to increase productivity. Innovation within the realm of management systems is usually in response to new environmental conditions, and to enhance the way whereby people are managed and work is organized. What is apparent here is that this form of innovation can become necessary by changes in the process, like the automation and the application of mistake proofing devices essentially (Shingo, 1986, Calvelage and Humble, 2002 and Tari, 2005).

In practical terms, business innovation concerns innovation in management thinking and its main aim would be to create new value and wealth for all stakeholders and hence to increase the level of economic prospects. This has been motivated by changes in external and internal environmental conditions, customers, competitors, suppliers and employees. What Grossi (1990) had stipulated here is that the main ability to adapt to changes in the environment can be said to be the main key to success, much more than factors such as company size. It has been suggested by Curry and Clayton (1992), Imai (1986) and Miller (1995) that there are two kinds of business innovation and these comprise of drastic and progressive. In essence, the former is the kind of innovation that has been proposed by reengineering and the latter latter is the type proposed by TQM via continuous improvement (Lorente, 1999).

In theoretical terms, it can be said that the requirement for business innovation is one of the reasons why companies have been embracing TQM. This does not necessarily mean that TQM is the appropriate management approach when it comes to developing and applying business innovation. There are two methods by which a company will be able to tackle innovation and these are by copying or developing their own innovations. When it comes to the first strategy, this can be very useful in situations that companies enjoy competitive advantages, like low wages, easy access to raw materials, protected markets and monopoly supply. In order to be able to obtain competitive advantage, the second type of strategy is a

better approach. Such an argument is valid when it comes to innovation in products as well as processes and also innovation in management thinking. The TQM approach is capable of being applied to both types of strategies. Practically speaking, companies that adhere to a TQM approach is capable of assimilating innovations that have been imported from other situations because of the willingness of its employees when it comes to accepting new ideas due to continuous improvement ethos that have been promoted by TQM. They are able capable of developing their very own innovations by building on the work of both continuous and breakthrough improvements (Lorente, 1999, Calvelage and Humble, 2002 and Claver et al, 2003).

A main element relating to TQM is the requirement for adequate customer focus and companies are required to have an identification of the current and future consumers' needs and also their level of satisfaction and loyalty. What can be foreseen here is that in the future, it is likely that global consumers would become increasingly demanding, and this is more so when it comes to the development of TQM within countries that are not very advanced yet like Saudi Arabia (Lorente, 1999; Calvelage, Humble, 2002; Appleby, Mavin, 2000).

What can be argued here is that TQM does not hinder business innovation and in most cases, the TQM dimensions, like customer focus, training, empowerment and teamwork, rationality within the analysis of production processes and benchmarking is capable of assisting an organization to be more innovative when it comes to its business activities. In order for this to take place, the TQM concept has to be well understood by management, and this is more so when it comes to the senior management team. It must be remembered here that TQM is also subject to change and is required to adapt to new conditions of work, competition and environmental situations, and these are likely to be driven by business innovation. The main theorization here is that the TQM has a strong impact on the successful implementation of one of the most important sources of business innovation (Lorente, 1999; Tari, 2005).

There are reports made that the most commonly used TQM practices include problem solving teams, training as a change effort, top-down implementation, development of relations with suppliers and collecting customer information.

There are a number of writers and practitioners that are noted to agree that these principles as common denominators amongst a number of applications of TQM and there are other characteristics that are said to be inclusive of teamwork and employee involvement and a holistic approach. Benchmarking, is something that is noted to have become strongly associated with TQM in the United States and Europe. It is stated that it is very a worrying to know that there is a very large majority of the TQM organizations that are said to use some form of modified performance measurement and reward systems and this is contrary to Deming's strong advice (Hackman, 1995).

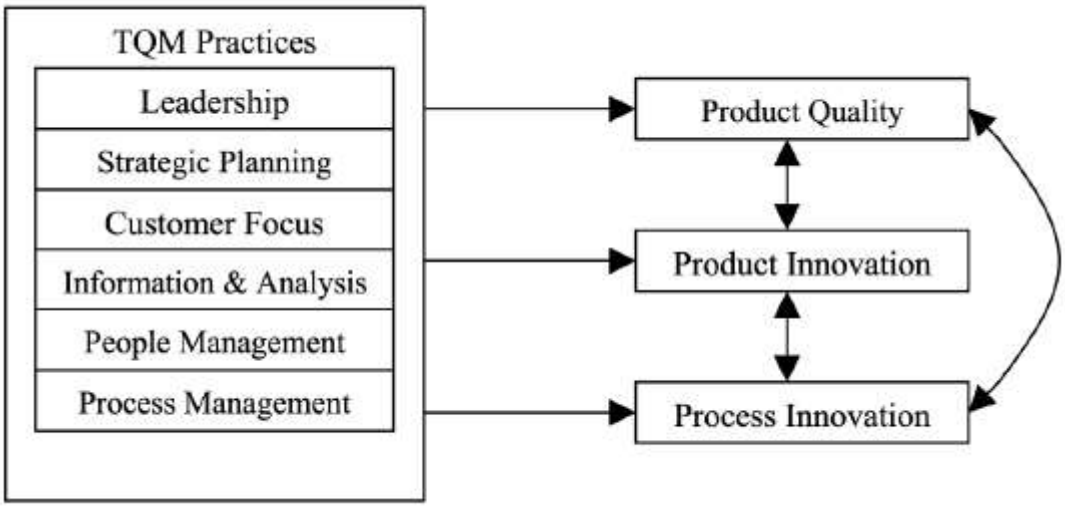
It is a fact that academicians like Deming, Juran and Ishikawa are said to be in agreement of the importance of scientific methods and this is so when it comes to controlling processes and quality. They are said to strongly emphasize the importance of statistical method when

it comes to monitoring process performance and also when it comes to identifying areas of improvement (Deming, 1986).

In being focused on the environment, TQM is said to represent a radical departure from classical theories as well as early human relations as being much more mechanical in terms of view of the organization as being something of a very closed system of an equilibrium seeking, mechanical nature (Morgan 1989, Burrell and Morgan 1978 and Hackman 1995). The TQM is said to emphasis on process, customer and continuous improvement and it is noted to bring organic Open System theory to mind. TQM's "Voice of the customer" (Scherkenbach, 1991) can be noted as being a very clear parallel to open system "negative feedback". (Morgan, 1997).

TQM's view of processes in being an interaction of five generic types of resources and these are outlined as being people, method, material, equipment and environment and it is said to resemble the ideas of socio-technical theory that was developed at the Tavistock institute (Deming 1986, Burrell and Morgan, 1978). It is theorized that due to the fact that people are important resources in a business process, it is apparent that both Deming and the Tavistock researcher Chris Argyris have pointed out on the bad impact of fear in the workplace (Deming, 1986) and (Argyris, 1994).

The Theoretical Framework



The Theoretical Framework will be Discussed Now.
Figure 1: The Research Framework

Methodology

The methodology that would be used here would comprise of quantitative methods of data collection. The main method of data collection, which is quantitative method, for this research was the use of questionnaires that were designed for the purpose of investigating the impact of best practice adoption of TQM by manufacturing firms and its impact upon the performance of the organization. This questionnaire had been developed according to the evaluation criteria that is used by major international quality awards and these include

the Malcolm Baldrige National and the European Quality Award. This questionnaire was distributed to 150 Saudi Arabian manufacturing firms and these firms had been selected at random. There are thousands of small and large firms that are operating in Saudi and these were selected due to the relevance to the research that is carried out. Of all the questionnaires that had been distributed, 88 of them had been returned fully completed and then subject to analysis and the outcome of the questionnaire analysis is presented below.

The Independent variables - TQM Model

A TQM model was developed and this comprised of 40 independent variables and it is noted here that these 40 items were selected from the AMC Data Base in accordance with their factor loadings that was obtained from Principal Components Factor Analysis. It is apparent here that these 40 items of the TQM model were loaded on a single TQM factor and it is so that each item had a factor loading greater than 0.3. This is noted to support construct validity of the model. In relation to content validity, this is to be supported by comparing the 40 items of the model with models from the literature, for instance, TQM practices that are identified by the GAO Study (1991). Each of these items that are in the TQM model was measured by using a five-point Likert type scale. This internal consistency of the TQM model was checked through the use of Reliability Analysis. This can be noted to indicate the extent to which the items in the model are related one another. It is so that internal consistency was estimated using a reliability coefficient Cronbach alpha; values range among 0 and 1.0. Typically, it is apparent that these coefficients have to be among 0.7 to 0.9 (Van de Ven and Ferry, 1979). The internal consistency in relation to the TQM model has a Cronbach alpha of 0.8. Therefore, the 40 items of the TQM model were accepted as having good interrelationship between them, indicating that our TQM model is reliable.

Dependent Variables - Organizational Performance

Organizational performance is something that can be characterized by 14 dependent variables that that were selected from a previous survey and these variables are said to range from the objective business performance measures and these include percentage growth in sales right up to subjective estimates that had been provided by site managers as far as employee morale is concerned. It is these kind of dependent variables that are on the basis of which it is possible to demonstrate the impact of TQM practice in relation to the performance of the organization. This variable has been selected on the basis of the nomenclature that was acquired from the GAO Study (1991).

Multivariate analysis

Multivariate Analysis of Variance (MANOVA) and Multivariate Analyses of Covariance (MANCOVA) were used assess the group differences across 14 multiple dependent variables simultaneously. According to Hair et al. (1992), the Pillais criterion or Wilk's lambda are the best statistical measures to assess whether an overall significant difference is found between groups. Good approximations for significance were obtained from Wilk's lambda that was transformed into an F statistic. Apparently, the smaller the value of the significance of F (p-value), the greater the implied significant difference between TQM and non-TQM groups that is apparent is Table I below. The multivariate analysis results indicate that there is a significant difference between TQM and non-TQM organizations. Based on these initial

findings, we conduct separate univariate tests of ANOVA and ANCOVA in order to address individual issues for each dependent variable of organizational performance. The table below represents the outcome of the multivariate analysis that is carried out:

Analysis procedure	Results Univariate F tests f(d.f.) = f value d.f. degrees of freedom	Significance of F (p)
MANOVA	$F(14,1007) = 6.197$	$p = 0.000$
MANCOVA (Cov: company size)	$F(14,1006) = 6.938$	$p = 0.000$
MANCOVA (Cov: industry type)	$F(14,1003) = 6.144$	$p = 0.000$
MANCOVA (Cov: ISO certification)	$F(14,840) = 4.648$	$p = 0.000$

Table I: Multivariate analysis MANOVA and MANCOVA

Analysis of variance (ANOVA)

Analysis of variance, ANOVA, was utilized so as to test H1 and it is so that the analysis shows that TQM does have a significantly positive effect on four of the 14 dependent variables and these are outlined in table II below.

Dependent variable	Variable	TQM mean	Statistical analysis ANOVA of dependent variable on total quality management F	Sig.F	Null hypotheses $H0 = 0$
Customer satisfaction	po7a	Positive	20.446	0.000	Reject
Employee morale	po7c	Positive	44.062	0.000	Reject
Cost of quality	po8c	Negative	0.297	0.586	Support
Delivery in full	po8j	Positive	16.700	0.000	Reject
Defect rates	po8a	Negative	1.737	0.188	Support
Warranty costs	po8b	Negative	1.464	0.227	Support
Productivity	po7d	Positive	52.489	0.000	Reject
Cashflow	po7c	Positive	18.756	0.000	Reject
Employee growth	pln-emp	Positive	2.147	0.143	Support
Market share growth	ln-mshg	Positive	0.056	0.814	Support
Sales growth	ln-salg	Positive	4.351	0.037	Reject
Export growth	ln-expg	Positive	1.128	0.288	Support
Innovation (new prod.)	percts	Positive	3.142	0.077	Support
Organisational perf.	orgperf.	Positive	42.887	0.000	Reject

Table II: Analysis of variants ANOVA of dependent variables on TQ

Analysis of Covariance

It is noted here that the aim of the ANCOVA was to test H2, H3, and H4 and this was to be by accounting for and removing the influence of company size; industry type and ISO 9000 certification status. These can be noted to be well controlled in the analysis by including them as covariates. Covariates can be noted as being variables that are correlated with the dependent variables. The effect of these covariates is removed before the analysis of variance (ANOVA) is calculated. The group means were inspected to confirm the direction of any differences (see Table II).

Controlling for company size

Company size, that was measured by the natural logarithm of the number of full time employees, was used as a covariate. This seems to suggests that company size may assist successful TQM implementation. The insignificantly negative effect of TQM on defect rates and warranty costs did not appear when company size was taken into account (table III). The relationship can be noted as becoming significantly negative. In fact, it is likely that company size and not TQM explains the two dependent variables' defect rates and warranty costs. Powell (1995) makes findings from an empirical study of TQM's performance consequences. The study is noted to have found that even though larger firms were more likely to adopt TQM than smaller firms, the correlation between company size and TQM was suggesting that company size may impede successful TQM implementation. This is supported by Fisher (1993) who had conducted a study of Australian Quality Council member companies (n = 49) so as to test the perceptions of CEOs on the link between TQM and organizational performance. Fisher found that the nature of the TQM approach adopted varied considerably according to company size. Fisher found that 88 per cent of the smaller companies (up to 100 employees) adapted a standard approach to TQM, generally offered by consultants and had an immediate expectation of TQM benefits to be gained. On the other hand, 94 per cent of the larger companies (more than 500 employees) developed their own approach to TQM and had a reasonable expectation in terms of benefits to be gained. Fisher stated: "The small companies expected benefits sooner, but they were generally disappointed". Fisher speculates that the larger and more established companies reported their achievement of TQM benefits later than the small companies. The reason for this, according to Fisher, is that CEOs of these companies tend to have a more mature appreciation of the TQM philosophy. Therefore, the large companies are more likely to believe in the "quality is free" philosophy, whereas small companies would still be preoccupied with the Acceptable Quality Level (AQL) concept. This concept can be noted as being premised on the fact that improving quality beyond an economic conformance level is economically suboptimal. AQL systems, therefore, are philosophically inconsistent with "quality is free" and "zero defects" notions (Crosby, 1979; Juran and Gryna, 1988).

Dependent variable	Variable	TQM mean	Statistical analysis ANCOVA of dependent variable on TQM						Null hypotheses		
			Company size		Industry type		ISO 9000 certification		Company size	Industry type	ISO 9000
			F.	Sig.*F.*	*F.*	Sig.*F.*	*F.*	Sig.*F.*	*H0*=0	*H0*=0	*H0*=0
Customer satisfaction	po7a	Positive	32.42	0.000	19.53	0.000	19.23	0.000	Reject	Reject	Reject
Employee morale	po7c	Positive	56.77	0.000	44.237	0.000	36.97	0.000	Reject	Supp.	Reject
Cost of quality	po8c	Negative	2.134	0.144	0.548	0.459	0.914	0.339	Supp.	Supp.	Supp.
Delivery in full	po8j	Positive	21.306	0.000	16.237	0.000	17.24	0.000	Reject	Reject	Reject
Defect rates	po8a	Negative	5.297	0.022	2.149	0.143	1.529	0.217	Supp.	Supp.	Supp.
Warranty costs	po8b	Negative	4.143	0.042	1.872	0.172	0.832	0.362	Supp.	Supp.	Supp.
Productivity	po7d	Positive	51.771	0.000	52.813	0.000	34.01	0.000	Reject	Reject	Reject
Cashflow	po7c	Positive	14.876	0.000	19.814	0.000	10.07	0.002	Reject	Reject	Reject
Employee growth	ln-emp	Positive	3.654	0.056	2.302	0.130	1.479	0.224	Reject	Supp.	Reject
Market share growth	ln-mshg	Positive	0.411	0.522	0.137	0.711	0.001	0.986	Supp.	Supp.	Supp.
Sales growth	ln-salg	Positive	6.752	0.009	4.443	0.035	1.62	0.203	Reject	Reject	Supp.
Export growth	ln-expg	Positive	1.024	0.312	1.090	0.297	0.464	0.496	Supp.	Reject	Supp.
Innovation (new prod.)	percts	Positive	2.879	0.090	8.041	0.005	3.78	0.05	Reject	Reject	Supp.
Organisational perf.	orgperf.	Positive	64.802	0.000	44.455	0.000	33.14	0.00	Reject	Reject	Reject

Table III: Analysis of covariance (ANCOVA)

Controlling for Industry Type

In relation to this, it is noted here that effect of industry type is pervasive across all sectors of the manufacturing industry and has a huge categorical effect on organizational performance. Industry type is noted to be measured on a categorical scale by assigning each sector to one of 12 categories that represents “kind” rather than “degree.” When the effect of industry type was removed, the insignificantly positive effect of TQM on innovation (new products) became significantly positive. In fact, it is likely that industry type and not TQM explains innovation of new products. Apparently, it is noted that this change can be

explained by considering manufacturing technology figures obtained by the Australian Bureau of Statistics. ABS (1991) found that the most commonly used advanced management technique in the Australian manufacturing industry was TQM, which was used by 24 per cent of the firms surveyed. It is appreciated that the pattern of TQM usage was found to vary by industry sector. For example, basic metal products sector use TQM the most, whereas wood, wood products and furniture the least.

Controlling for ISO 9000 certification status

A third covariate, ISO 9000 certification status is noted to also have an influence on the dependent variable. The association between ISO 9000 certification and TQM were tested using ANOVA. This relationship was significantly related, When the effect of ISO 9000 certification was removed there was no change in the significance in any of the 14 dependent variables. This finding confirms an earlier study by Terziovski, et al. (1997) on the business value of ISO 9000 certification. The authors found that ISO 9000 certification is not shown to have a significantly positive effect on organizational performance in the presence or absence of a TQM environment. This supports the view that on average, ISO 9000 certification does not have much explanatory power of organizational performance. On the basis of the results of this study, the researchers believe that ISO 9000 certification can contribute to organizational performance if a climate of change is created. However, this is not yet happening on a widespread basis. ISO 9000 certification may act as a foundation on which to build a quality organization where it is implemented as part of the TQM philosophy and methods

Hypothesis Testing

Testing of H1

The principal high-level finding is that TQM is significantly related to a variety of performance measures, is consistent with many anecdotal experiences and empirical studies (GAO Study, 1991). Hence, it is noted here that hypothesis H1 is supported for six of the 14 organizational performance variables: customer satisfaction. employee morale, delivery in full on time, productivity, cashflow, and sales growth.

Testing H2

Covariate: company size. The strength of the relationship between TQM and defect rates and TQM and warranty costs changed from insignificantly negative to significantly negative. Therefore, H2 is supported.

Testing H3

Covariate: industry type. The relationship between TQM and innovation of new products changed from insignificantly positive to significantly positive. All other relationships were not affected. Therefore, H3 is supported.

Testing H4

Covariate: ISO 9000 certification status. The relationship between TQM and the 14 organizational performance variables did not change as a result of the covariate ISO 9000 certification. Therefore, H4 is rejected.

Limitations of Study

It is submitted here that there are a variety of validating procedures as well as controls that were utilized in this research. For instance, it was found that it was very useful to place control in relation to the company size, the type of industry as well as the ISO 9000 certification, which could cause for the production of spurious results. It is noted that other studies have not implemented the use of such kind of controls. The methods of survey that had been used here do exhibit some limitations. A particular limitation here concerns the cross-sectional research design of this research.

Conclusion

On the basis of the research results, what can be concluded here is that the practice and application of TQM principles have had a very positive impact on the operational and business performance, employee relations and also the level of customer satisfaction. What was found here is that there was a significant level of differences within the relationship that existed between TQM as well as organizational performance all throughout various industry sectors and various different company sizes and this is more so when it comes to the impact of defect rates, the costs relating to warranty as well as the innovation of brand new products. The results indicate that there is no guarantee that TQM would definitely produce superior profitability and there is no guarantee there are improved returns that can only be obtained by organizations that have a higher quality of products and services. Some organizations have been known to be able to achieve good returns even without an application of the principles and practices of TQM. It was also noted that there were organizations that had applied TQM and have not managed to obtained good profit record. On the basis of the research findings, it is concluded that a typical type of manufacturing firm is far more likely to be capable of achieving more comprehensive performance in the fields of employee relations, operational performance, customer satisfaction, and also business performance, where they are able to apply the principle and practices of TQM. These research findings suggest that the implementation of TQM at Saudi organizations would be very helpful when it comes to improving performance and bringing a competitive advantage. In essence, this finding can be described as being consistent with the literature pertaining to quality management (GAO Study, 1991, Garvin, 1991 and Powell, 1995).

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