The Role of Total Quality Management (TQM) Practices on Improving Organisational Performance in Manufacturing and Service Organisations.

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Abstract

Organisations in South Africa now, more than ever before, need to introduce Total Quality Management (TQM) in their organisational culture to provide outstanding products and services to their customers. Although TQM has been introduced to improve organisational performance, it is perceived that some organisations have not accomplished much over the years. Achieving results by implementing TQM is challenging and depends on (i) leadership, (ii) employee involvement, (iii) customer focus, (iv) strategic planning, (v) supplier relations, (vi) process management and (vii) information analysis. These principles must be incorporated in the organisational performance measures in terms of (i) quality improvement, (ii) product/service quality, (iii) customer satisfaction, (iv) employee satisfaction and (v) supplier performance. Current research in both the manufacturing and service industries in South Africa reveals that TQM does have an influence on the five organisational performance measures and plays an important role in the performance and success of an organisation.

Keywords

Total quality management, organisational performance, performance measure, customer satisfaction

1. Introduction

The impact of global competition is forcing organisations to place greater emphasis on providing customers with high quality products and services [Baloyi, 2013] [Dale, 1999] [Edosmwan, 2002]. Consequently, improving the quality of products, processes and services is a major challenge facing South African organisations as well as organisations worldwide. Many organisations fail because they do not take cognisance of the long-term benefits of Total Quality Management (TQM) practices. Organisations do not realise the value of integrating these practices into their daily operations.

Therefore, the following objectives have been developed for the study:

a) To design and administer a questionnaire to determine the role and impact of quality improvement, customer satisfaction, employee satisfaction, product/service quality and supplier performance in the manufacturing and service organisations, which lead to organisational performance.
b) To determine the relationship between TQM practices and organisational performance by means of hypothesis testing.

In line with objective b) the following hypotheses were developed:

H_1: The TQM practices are positively related to quality improvement.
H_2: The TQM practices are positively related to product/service quality.
H_3: The TQM practices are positively related to customer satisfaction.
H_4: The TQM practices are positively related to employee satisfaction.
H_5: The TQM practices are positively related to supplier performance.

2. Literature review

Quality is extremely advantageous for every organisation today. Quality plays a significant role in the business environment of organisations as quality and continuous quality development guarantee an organisation´s survival in a competitive environment. [Evans, 2005] [Foster, 2007]. A plethora of studies have been undertaken on the role of TQM practices in enhancing organisational performance in both manufacturing and service organisations. Some studies were undertaken in specific industries whilst others were comparative in nature. Brief reviews of some of the studies are presented below and selected TQM practices are highlighted.

2.1 Implementation of TQM in global organisations

Chin, Tummala and Chan (2003) conducted a survey of the implementation of TQM practices in the Hong Kong electronics and toy product organisations. These organisations were required to indicate the extent to which TQM practices were being implemented and practiced. The five TQM practices used in their study were (i) *customer focus, (ii) leadership, (iii) strategic planning, (iv) activity based management and (v) continuous improvement.* Their study established that both Hong Kong industries regarded customer focus as the most important TQM practice. Mady (2009) conducted a survey of the implementation of TQM in two Kuwaiti industrial sectors, namely food processing and refractors. The TQM practices of (i) *customer focus, (ii) employee involvement and (iii) core quality practices* were used in their study. He found that these three TQM practices were used in both industries to improve quality. Arumugam, Ooi and Fong (2008) explored the relationship between TQM practices and organisational performance in Malaysian manufacturing organisations. The TQM practices identified in their study were (i) *leadership, (ii) process management, (iii) information analysis, (iv) customer focus, (v) supplier relations, (vi) quality system improvement, (vii) continual improvement and (viii) employee involvement.* They found that a positive relationship existed between customer focus and organisational performance.

2.2 Implementation of TQM in South African organisations

Oschman, Stroh and Auriacombe (2006) studied the attitude of personnel at South African Air Force bases towards the implementation of TQM. They developed a framework consisting of six core practices and eight supporting practices. They found that the attitude of respondents in three out of the six core practices *(leadership, employee involvement and strategic planning)* was very positive with respect to quality improvements. With regard to the manufacturing sector, [Baloyi, 2013] [Tashakkori and Creswell, 2007] [Ceronio, 1996], identified the following TQM practices as imperative to the implementation and success of TQM in manufacturing industries: (i) *top management commitment* and *(ii) communication, (iii) employee involvement through training, (iv) quality strategy, (v) product quality* and *(vi) customer satisfaction.* He highlighted these practices as critical factors to enhancing organisational performance.

2.3 Implementation of TQM in manufacturing and service industries

In today's competitive business environment TQM has experienced a fundamental shift. The theory is no longer restricted to the manufacturing sector. It has now been extended to service sectors such as health care, education, hospitality and financial institutions, to name a few [Lakhe and Mohanty, 1995]. It has been identified and acknowledged the applicability of TQM for sustainable competitive advantage and especially highlighted its value for the service sector. The growth of the service industry has resulted in an increased focus on TQM in service organisations delivering high-quality services to customers [Schneider and White, 2004] and [Talib, Rehman and Qureshi, 2013]. According to Gustafsson, A, Nilsson and Johnson (2003), studies were undertaken in the manufacturing sector and later spread to the service sector. Therefore, the study has endeavoured to include the service environment and draw a comparison with the manufacturing environment.

3. Research Framework

The following research framework was followed. Studies were conducted using empirical hypotheses to test specific

TQM practices such as leadership (top management commitment), employee involvement (human resource management) or customer focus, to determine their effect on organisational performance. Other practices that were identified are: supplier relations, strategic planning, process management and information analysis [Taylor and Wright, 2006]. A discussion on the evaluation of the importance of each of these practices and their success as drivers of TQM are illustrated in Figure 1.

Figure. 1 – Research framework

3.1 Leadership

Gonzalea and Guillen (2002) agreed that "management commitment and leadership" is one of the most important factors for the successful implementation of TQM. Leadership had to create and maintain an environment that required the involvement of all employees to achieve the quality objectives of the organisation. Furthermore, leadership generates a trustworthy environment that is to influence employees to operate beyond formal power and bring about intense changes. Therefore, the quality improvement process begins with leadership's commitment to quality initiatives [Kachru, 2007] [Lakshman, 2006]. This in turn leads to the higher level of involvement by employees in the organisation and their contribution to quality initiatives.

3.2 Employee Involvement

Employee involvement is a process designed to empower members of an organisation to make decisions and to solve problems appropriate to their level in the organisation. The importance of employee involvement in the organisation is well established in TQM. Employee involvement can take a variety of forms such as job participation, teamwork, employee empowerment, training and development, to name a few [Spector, 1997]. Employee involvement is regarded as the most important ingredient to achieve quality commitment and results. This means that every employee in an organisation is involved in the quality improvement of products and processes [Edosmwan, 2002]. In addition, employee training, resource allocation, employee empowerment, quality awareness and employee recognition have been identified as important dimensions of employee involvement [Abdullah, Uli and Tari, 2008] [Gryna, Chua and DeFoe, 2001].

3.3 Customer Focus

Quality specialists such as Deming, Juran and Crosby, have recognised customer focus as the key to continuous quality improvement in organisations. In their comprehensive review of literature, reports that customer focus had received

the widest coverage. The importance of customer focus is the principal point of any quality initiative. The goal of satisfying customers is fundamental to TQM, and the goal could be achieved by an organisation's attempt to design and deliver products and services that fulfil customer needs [Cai, 2009] [Soderquist, Chanaran and Motwani, 1997]. Customer focus is critical to TQM since it is the customer who dictates the level of quality they want to receive. This means that organisations have to listen to their customers, collect information from their customers and, by analysing this information, determine the needs and expectations of customers [Jablonski, 1992] [Ooi, Lui, Hung and Yen, 2010].

3.4 Supplier Relations

The supplier relationship is the supply chain process that provides the structure for managing relations with suppliers. The supplier relationship is the discipline of strategically planning for, and managing, all interactions with third party organisations that supply goods and/or services to an organisation in order to maximize the value of those interactions [Chip, Reinecker and Spiller, 2004]. A competitive business environment puts pressure on organisations to improve quality, deliver performance and be responsive while continuing to reduce costs. For some organisations this means reducing the supplier base and developing closer relationships with remaining suppliers [Park, Shin, Chong and Park, 2010] [Sanders, Murph and Eng, 1980]. Fifty percent of an organisation's non-conformances are due to defective incoming material and resources. The relationship between supplier and buyer is one of the most important parts of the quality improvement process. Therefore, organisations are now implementing Supplier Relationship Management (SRM). In this instance, long term supplier relationships with suppliers need to be established [Kannan and Tan, 2006] [Leonard and Sasser, 1982] [Pande, Neumann and Cavanaugh, 2000].

3.5 Strategic Planning

Strategic management is an ongoing process that assesses the market in which the organisation is involved, evaluates its competitors and then sets goals and formulates strategies to meet all existing and potential customer needs [Treiman, 2009] [Venter, 2006]. Strategic planning is of dynamic importance in establishing TQM [Cascella, 2002]. Through strategic planning, specific TQM objectives and requirements of an organisation can be determined and integrated into a strategic plan. Strategic planning should be used to plan, develop and implement strategies that would result in improved customer and employee satisfaction [Cascella, 2002] [Oschman, Stroh and Auriacombe, 2005].

3.6 Process Management

TQM is a customer-based approach. The emphasis on customer service requires an organisation to be process based. TQM relies on the belief that the overall quality of products can be enhanced by improving the quality of the processes directly or indirectly related to its manufacture or the service provided [Ahire, Golhar and Waller, 1996]. Processes involve determining what work is needed to accomplish a goal, assigning tasks to individuals and arranging those individuals in an organisational structure supportive of decision-making. A properly implemented process should result in a work environment where all employees execute tasks to achieve goals, both effectively and efficiently. Process management also consists of the analysis and improvement of interdisciplinary tasks within an organisation [Harrington, 1991] [Oakland 2003].

3.7 Information Analysis

Simply collecting information is not enough. Organisations must ensure that information systems are accurate, user-friendly and secure, and that information is available to all who require it. The availability of such information helps managers in the decision-making process [Tashakkori and Creswell, 2007]. Organisations that consistently collect and analyse information will be more successful than those that do not. One of the main challenges facing organisation's today, is the increasing flow of information as well as the quality of data being distributed [Lee, Ooi, Sohal and Chang, 2012].

3.8 Organisational Performance

The successful implementation of TQM, will lead to numerous benefits such as a reduction in costs, an improvement in product or service quality, an increased market share and augmented customer satisfaction. It was identified that certain practices of TQM such as leadership and employee involvement were associated with improved organisational performance [Bricknell, 1996] [Yusof and Aspinwell, 2000].

3.9 Measures of Organisational Performance

3.9.1 Quality Improvement

There is a clear relationship between quality and productivity. Productivity can be increased by simplifying the production process and eliminating waste [Garvin, 1987]. Gitlow, Oppenheim and Levine (2005) identified several benefits from improving the production process such as a reduction in rework, an increase in productivity and an improvement in the quality of products and processes. In their survey of Australian manufacturing organisations, [Mandal, Shah, Love and Li, 1999] found that 65% of these organisations achieved a reduction in rejects through the use of statistical quality techniques. They noted that the cost of quality, inventory, scrap and rework was reduced through the prevention of defects rather than detection. Radovolsky, Gotcher and Slattsveen (1996) performed a statistical analysis of survey data obtained from manufacturing and service organisations using the five quality improvement dimensions of error/defect reduction, quality cost reduction, productivity improvement, profitability and reduction in customer complaints. Their findings indicate that the number of TQM practices that were used in the quality improvement of products and processes had a significant influence on the reduction in errors/defects and an increase in productivity and profitability.

3.9.2 Product/Service Quality

The need for understanding customer expectations is a prerequisite for delivering superior products and services, because they represent the implicit measures which customers use in assessing product and service quality. Customer pressures for cost reductions and increasing global competition based on overall product and service quality are the most important drivers of quality improvement initiatives [Sila and Ebrahimpour, 2005]. To improve product and service quality, it is imperative to measure the existing quality of products and services in order to identify what needs improvement [Evans, 2005] [Foster, 2007].

3.9.3 Customer Satisfaction

Customer satisfaction is defined as the overall attitude of customers towards a product or service after they have acquired and consumed/used it [Malhortra, 1999]. During and after the use of a product or service, customers will develop feelings of satisfaction or dissatisfaction. Satisfaction or dissatisfaction levels are a function of the difference between perceived performance and expectation of a product or service. It was found that the goal of satisfying customers is fundamental to TQM and that this goal can be achieved by an organisation's attempt to design and deliver products and services to fulfil customer needs. Therefore, TQM is a corporate state of mind that succeeds only when the organisation is willing to change, to make decisions based on the primary goal of satisfying customer needs [Johnson and Christensen, 2008]. TQM as a set of management practices, focusing on customer satisfaction, has been widely adopted by many organisations [Spector, 1997] [Vermeulen, 1996]. TQM allows organisations to achieve a great degree of differentiation, satisfying customer needs, strengthening organisational performance and brand image [Crawford, 1990]. Managers should therefore, in their overall business processes, create initiatives and training programmes to increase customer satisfaction. Dramatic changes in the business environment have led to increased customer awareness of quality.

3.9.4 Employee Satisfaction

Employee satisfaction is a measure of how happy (satisfied) employees are with their job and work environment. Organisations should implement a culture that encourages and enforces employee satisfaction. Employees are more loyal to their organisations and productive in their work when they are satisfied with their jobs. These employees affect customer satisfaction which leads to organisational performance [Hunter and Tietyen, 2009] [Sousa, 2003]. Many organisations that have adopted TQM have seen an improvement in the attitudes, commitment and retention of employees. Since TQM is intended to create an environment that shows the best in each employee, it is expected to improve employee and job satisfaction through involvement and empowerment [Karia and Asaari, 2006]. TQM holds a set of practices which contribute to improving employee involvement, performance and satisfaction through education and training.

3.9.5 Supplier Performance

TQM has been the key to the globalisation of manufacturing and service industry for years. Some techniques have been adopted across the world, which have facilitated the supply chain of today, by raising the performance of suppliers. Customer satisfaction depends on supplier performance. In the past twenty years, supplier performance has played a crucial role in the supply chain. This is due to suppliers being one of the major components of an

organisation's policy and procedures [Bhatt and Huq, 2002]. It was found that the will and capacity of suppliers sharing information has a significant impact on their performance [Vermeulen, Pretorius, Sukdeo and Kruger, 2017) [Kannan and Tan, 2006] [Lascellas and Dale, 1989].

4. Research Methodology

4.1 Research Instrument

The research instrument utilised in the study was a questionnaire, which consisted of three sections. The first section identified biographical details, the second identified and measured the seven constructs of TQM practices and the third identified and measured the five organisational performance measures. The self-administered questionnaire was personally delivered to 90 randomly selected manufacturing and service organisations. Thirteen of the organisations declined to participate due to the confidentiality of the information which would be obtained from the organisations. Eight questionnaires were not returned and of the 69 that were returned, 4 were discarded because they were incomplete. Therefore, the sample consisted of 65 respondents, which comprised 33 manufacturing organisations and 32 service organisations.

5. Hypothesis Testing

5.1 Independent and Dependent Variables

An independent variable (predictor variable) is a variable that is manipulated by the researcher to determine the effect it has on another variable. The variable that is influenced by the independent variable is known as the dependent variable (criterion or response variable) [Rao, Raghunathan and Solis, 1999]. In testing the hypotheses, the independent variables are the TQM practices of leadership, employee involvement, customer focus, strategic planning, process management, supplier relations and information analysis. The dependent variables are the organisational performance measures of quality improvement, product/service quality, customer satisfaction, employee satisfaction and supplier performance. Multiple regression analysis was used to test the five hypotheses. It is a useful technique that can be utilised to analyse the relationship between a single dependent variable and several independent variables [Levine, Ramsay and Smidt, 2001]. The statistical analysis of data, using multiple regression analysis, proceeded as discussed below.

5.2 Testing the Validity of the Multiple Regression Model

The initial step in the analysis is to employ testing to determine the ability of the multiple independent variables to explain the behaviour of a single dependent variable. The *F-distribution* test was applied in testing the hypothesis. The *F-test* indicates the usefulness of a multiple regression model in predicting a dependent variable [McClave and Sincich, 2003]. More specifically, this study tested whether the independent variables of (i) leadership, (ii) employee involvement, (iii) customer focus, (iv) strategic planning, (v) supplier relations, (vi) process management and (vii) information analysis, are capable of effectively estimating the effect on the dependent variables of quality improvement, product/service quality, customer satisfaction, employee satisfaction and supplier performance. The coefficient of multiple determination (R^2) is used as a next step of this analysis to estimate the percentage of variation in the dependent variable that can be explained by the set of independent variables. McClave and Sincich (2003) regarded this coefficient as a statistical quantity which indicates how well the multiple regression models fit the data. They state that a value close to zero shows a weak fit whereas a value close to one shows a good fit.

5.2.1 The relationship between the independent variable (TQM constructs) and the dependent variable (quality improvement)

Table. 1 – Coefficients of dependent variable (quality improvement)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.128	0.426		0.300	0.765
Leadership	0.032	0.149	0.029	0.216	0.830

Employee Involvement	0.242	0.151	0.237	1.604	0.114
Customer Focus	0.228	0.149	0.204	1.529	0.132
Supplier Relations	0.081	0.132	0.073	0.612	0.543
Strategic Planning	0.237	0.149	0.236	1.596	0.116
Process Management	0.138	0.139	0.137	0.995	0.324
Information Analysis	-0.010	0.110	-0.011	-0.093	0.926

The regression analysis in Table 1, identified the relationship between the predictors (TQM practices) and the dependent variable Quality Improvement. The contribution of the predictor variable, Information analysis was not significant (t = - 0.093) to the variation of the dependent variable, Quality Improvement. Therefore, Information and analysis was excluded since it did not contribute in a significance to the change in Quality Improvement. Using the information in Table 1, the estimated regression model is given in the following regression equation:

$$y(\mathbf{QI}) = 0.128 + 0.032(x_1) + 0.242(x_2) + 0.228(x_3) + 0.081(x_4) + 0.237(x_5) + 0.138(x_6)$$

where QI = Quality Improvement
x_i = relates to each element
$_i$ = 1, 2, 3, 4, 5, 6, 7
x_1 = Leadership
x_2 = Employee Involvement
x_3 = Customer Focus
x_4 = Supplier Relations
x_5 = Strategic Planning
x_6 = Process Management
x_7 = Information Analysis

The coefficient of determination (R^2) is an estimate of the percentage variation in the dependent variable (QI) which can be predicted from the independent variable (TQM practices). This coefficient shows how well the multiple regression model fits the data. A value close to zero shows a weak fit whereas a value close to one implies a good fit. The R^2 – *value* of 0.607 in Table 27, indicates that 60.7% of the variation in QI can be explained by the 6 predictor variables identified in the regression equation. The larger beta (β) coefficients are 0.242, 0.228 and 0.237, corresponding to Employee involvement, Customer focus and Strategic planning, respectively (independent variables) which means that one unit increase in Employee involvement is followed by 0.242 unit increase in QI. Similarly, the other positive beta coefficients, mean that one unit increase in either one of the beta coefficients would result in a unit increase in QI. It is evident that Employee involvement, Customer focus and Strategic planning (t = 1.604, t = 1.529 and t = 1.596, respectively) have a significant impact on QI whereas the other elements are not as highly significant. Therefore, based on the above multiple regression analysis, the first hypothesis (H_1) which relates the TQM elements to QI, is partially supported.

5.2.2 The relationship between the independent variable (TQM constructs) and the dependent variable (product/service quality)

Table. 2 – Coefficients of dependent variable (product/service quality)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.748	0.439		1.701	0.094
Leadership	0.125	0.154	0.123	0.813	0.420
Employee Involvement	0.154	0.156	0.163	0.992	0.326
Customer Focus	0.267	0.154	0.258	1.737	0.088

Supplier Relations	-0.079	0.136	-0.078	-0.582	0.563
Strategic Planning	0.037	0.153	0.040	0.241	0.811
Process Management	0.088	0.143	0.094	0.615	0.541
Information Analysis	0.208	0.114	0.246	1.827	0.073

The regression analysis Table 2, identified the relationship between the predictors (TQM elements) and the dependent variable Product / Service Quality. The contribution of the predictor variable, Supplier Relations was not significant (t = - 0.582) to the variation of the dependent variable, Product / Service Quality. Therefore, Supplier Relations was excluded since it did not contribute in significance to the change in Product / Service Quality. Utilising the results in Table 2, the estimated regression model is given in the following regression equation:

$$y(\text{PSQ}) = 0.748 + 0.125(x_1) + 0.154(x_2) + 0.267(x_3) + 0.037(x_5) + 0.088(x_6) + 0.208(x_7)$$

where PSQ = Product / Service Quality
x_i = relates to each element
$_i$ = 1, 2, 3, 4, 5, 6, 7
x_1 = Leadership
x_2 = Employee Involvement
x_3 = Customer Focus
x_4 = Supplier Relations
x_5 = Strategic Planning
x_6 = Process Management
x_7 = Information Analysis

The coefficient of determination (R^2) is an estimate of the percentage variation in the dependent variable (PQS) which can be predicted from the independent variable (TQM elements). This coefficient shows how well the multiple regression model fits the data. A value close to zero shows a weak fit whereas a value close to one implies a good fit. The R^2 – *value* of 0.514 in Table 2, indicates that 51.4% of the variation in PSQ can be explained by the 6 predictor variables identified in the regression equation. The beta (β) coefficient reflected in Table 2 are the values for the regression equation for predicting the dependent variable from the independent variable. The larger beta (β) coefficient is 0.267, corresponding to Customer focus (independent variable), which means that one standard deviation increase in Customer focus is followed by 0.267 standard deviation increase in PSQ. Similarly, the other positive beta coefficients corresponding to Leadership (0.125), Employee involvement (0.154), Customer focus (0.267), Strategic planning (0.037), Process management (0.088) and Information analysis (0.208), means that one standard deviation increase in either one of the beta coefficients would result in a standard deviation increase in PSQ. It is evident that Customer Focus (t = 1.737) as well as Information Analysis (t = 1.827) has a slight significant impact on PSQ. Therefore, based on the above multiple regression analysis, the second hypothesis (H_2) which relates the TQM elements to PSQ, is partially supported.

5.2.3 The relationship between the independent variable (TQM constructs) and the dependent variable (customer satisfaction)

Table. 3 – Coefficients of dependent variable (customer satisfaction)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.026	0.436		2.353	0.022
Leadership	0.130	0.152	0.132	0.851	0.399
Employee Involvement	0.172	0.155	0.188	1.110	0.272
Customer Focus	0.373	0.152	0.374	2.447	0.018

Supplier Relations	-0.061	0.135	-0.062	-0.451	0.654
Strategic Planning	-0.026	0.152	-0.028	-0.168	0.867
Process Management	0.089	0.142	0.098	0.626	0.534
Information Analysis	0.085	0.113	0.104	0.751	0.456

The above regression analysis identified the relationship between the predictors (TQM practices) and the dependent variable Customer satisfaction. The contribution of the predictor variable, Supplier Relations and Strategic planning were not significant (t = - 0.451 and t = - 0.168, respectively) to the variation of the dependent variable, Customer satisfaction. Therefore, Supplier Relations and Strategic planning were excluded since it did not contribute in significance to the change in Customer satisfaction. Utilising the results in Table 3, the estimated regression model is given in the following regression equation:

$$y(\mathbf{CS}) = 1.026 + 0.130(x_1) + 0.172(x_2) + 0.373(x_3) + 0.089(x_6) + 0.085(x_7)$$

where CS = Customer satisfaction
x_i = relates to each element
$_i$ = 1, 2, 3, 4, 5, 6, 7
x_1 = Leadership
x_2 = Employee Involvement
x_3 = Customer Focus
x_4 = Supplier Relations
x_5 = Strategic Planning
x_6 = Process Management
x_7 = Information Analysis

The coefficient of determination (R^2) is an estimate of the percentage variation in the dependent variable (CS) which can be predicted from the independent variable (TQM elements). This coefficient shows how well the multiple regression model fits the data. A value close to zero shows a weak fit whereas a value close to one implies a good fit. The R^2 – *value* of 0.486 in Table 3, indicates that 48.6% of the variation in CS can be explained by the 5 predictor variables identified in the regression equation. The beta (β) coefficient reflected in Table 3 are the values for the regression equation for predicting the dependent variable from the independent variable. The larger beta (β) coefficient is 0.373, corresponding to Customer focus (independent variable), which means that one standard deviation increase in Customer focus is followed by 0.373 standard deviation increase in CS. Similarly, the other positive beta coefficients corresponding to Leadership (0.125), Employee involvement (0.154), Customer focus (0.267), Process management (0.089) and Information analysis (0.085), means that one standard deviation increase in either one of the beta coefficients would result in a standard deviation increase in CS. It is evident that Customer focus (2.447) has a significant impact on CS, as focusing on customer needs is crucial to attaining loyal, satisfied customers. Therefore, based on the above multiple regression analysis, the third hypothesis (H_3) which relates the TQM elements to CS, is partially supported.

5.2.4 The relationship between the independent variable (TQM constructs) and the dependent variable (employee satisfaction)

Table. 4 – Coefficients of dependent variable (employee satisfaction)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.685	0.432		1.586	0.118
Leadership	0.057	0.151	0.058	0.379	0.706
Employee Involvement	0.492	0.153	0.535	3.216	0.002
Customer Focus	-0.035	0.151	-0.035	-0.231	0.818

Supplier Relations	0.100	0.133	0.101	0.750	0.457
Strategic Planning	-0.004	0.151	-0.005	-0.027	0.979
Process Management	0.102	0.140	0.112	0.727	0.470
Information Analysis	0.008	0.112	0.010	0.075	0.940

The above regression analysis identified the relationship between the predictors (TQM practices) and the dependent variable Employee satisfaction. The contribution of the predictor variable, Customer focus and Strategic planning were not significant (t = - 0.231 and t = - 0.027, respectively) to the variation of the dependent variable, Employee satisfaction. Therefore, Customer focus and Strategic planning were excluded since it did not contribute in significance to the change in Employee satisfaction. Using the information in Table 34, the estimated regression model is given in the following regression equation:

$$y(\text{ES}) = 0.685 + 0.057(x_1) + 0.492(x_2) + 0.100(x_3) + 0.102(x_4) + 0.008(x_5)$$

where ES = Employee satisfaction
x_i = relates to each element
$_i$ = 1, 2, 3, 4, 5, 6, 7
x_1 = Leadership
x_2 = Employee Involvement
x_3 = Customer Focus
x_4 = Supplier Relations
x_5 = Strategic Planning
x_6 = Process Management
x_7 = Information Analysis

The coefficient of determination (R^2) is an estimate of the percentage variation in the dependent variable (ES) which can be predicted from the independent variable (TQM elements). This coefficient shows how well the multiple regression model fits the data. A value close to zero shows a weak fit whereas a value close to one implies a good fit. The R^2 – *value* of 0.502 in Table 4, indicates that 50.2% of the variation in ES can be explained by the 5 predictor variables identified in the regression equation. The beta (β) coefficient reflected in Table 4 are the values for the regression equation for predicting the dependent variable from the independent variable. The larger beta (β) coefficient is 0.492, corresponding to Employee involvement (independent variable), which means that one standard deviation increase in Employee involvement is followed by 0.492 standard deviation increase in ES. Similarly, the other positive beta coefficients corresponding to Leadership (0.057), Supplier relations (0.100), Process management (0.102) and Information analysis (0.008), means that one standard deviation increase in either one of the beta coefficients would result in a standard deviation increase in ES. It is evident that Employee involvement (t = 3.216) has a significant impact on Employee satisfaction. Therefore, based on the above multiple regression analysis, the fourth hypothesis (H_4) which relates the TQM elements to ES, is partially supported.

5.2.5 The relationship between the independent variable (TQM constructs) and the dependent variable (supplier performance)

Table. 5 – Coefficients of dependent variable (supplier performance)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.790	0.430		1.840	0.071
Leadership	-0.272	0.150	-0.270	-1.814	0.075
Employee Involvement	0.161	0.152	0.170	1.055	0.296

Customer Focus	0.070	0.150	0.068	0.464	0.644
Supplier relations	0.515	0.133	0.510	3.888	0.000
Strategic Planning	0.108	0.150	0.117	0.723	0.472
Process Management	0.132	0.140	0.142	0.946	0.348
Information analysis	0.018	0.111	0.022	0.164	0.870

The regression analysis in Table 5, identified the relationship between the predictors (TQM elements) and the dependent variable Supplier performance. The contribution of the predictor variable, Leadership was not significant (t = - 1.814) to the variation of the dependent variable, Supplier performance. Therefore, Leadership was excluded since it did not contribute in significance to the change in Supplier performance. However, this variable will be investigated further as top management plays an integral role in the overall performance of an organisation. Using the information in Table 5, the estimated regression model is as given in the following regression equation:

$$y(\mathbf{SP}) = 1.026 + 0.130(x_1) + 0.172(x_2) + 0.373(x_3) + 0.089(x_4) + 0.085(x_5)$$

where SP = Supplier performance
x_i = relates to each element
$_i$ = 1, 2, 3, 4, 5, 6, 7
x_1 = Leadership
x_2 = Employee Involvement
x_3 = Customer Focus
x_4 = Supplier Relations
x_5 = Strategic Planning
x_6 = Process Management
x_7 = Information Analysis

The coefficient of determination (R^2) is an estimate of the percentage variation in the dependent variable (SP) which can be predicted from the independent variable (TQM elements). This coefficient shows how well the multiple regression model fits the data. A value close to zero shows a weak fit whereas a value close to one implies a good fit. The R^2 – *value* of 0.502 in Table 5, indicates that 50.2% of the variation in SP can be explained by the 6 predictor variables identified in the regression equation. The beta (β) coefficients reflected in Table 5, are the values for the regression equation for predicting the dependent variable from the independent variable. The larger beta (β) coefficient is 0.515, corresponding to Supplier relations (independent variable), which means that one standard deviation increase in Supplier relations is followed by 0.515 standard deviation increase in SP. Similarly, the other positive beta coefficients corresponding to Employee involvement (0.161), Customer focus (0.070), Strategic planning (0.108), Process management (0.132) and Information analysis (0.018), means that one standard deviation increase in either one of the beta coefficients would result in a standard deviation increase in SP. It is evident that Supplier relations (t = 3.888) has a slight significance on Supplier performance. Therefore, based on the above multiple regression analysis, the fifth hypothesis (H_5) which relates the TQM elements to SP, is partially supported.

6. Analysis of findings

6.1 Profile of Respondents

Table. 1 represents the demographic profile of the participating respondents. The response rate was moderately high at 72.22 % (65 out of 90).

Table. 6 – Profile of respondents

	Number of respondents	***% of respondents***
Type of industry		
Manufacturing	33	50.8
Services	32	49.2

Size of organisation		
Small (less than 50)	1	1.5
Medium (51 – 100)	2	3.0
Large (more than 100)	62	95.4
Gender profile		
Male	42	64.6
Female	23	35.4
Age of respondents		
Under 30 years	7	11.0
30 – 40 years	28	43.0
Over 40 years	30	46.0
Years of experience in the quality field		
Up to 5 years	6	9.0
6 – 10 years	21	33.0
Over 10 years	38	58.0

6.2 Validity

According to [Leedy and Ormrod, 2001] validity refers to the soundness and the effectiveness of the measuring instrument. The validity of a measuring instrument is the extent to which the instrument measures what is intended to measure [Fink, 2008].

6.2.1 Construct Validity

Confirmatory factor analysis will be used to test the construct validity. Factor analysis validates a construct by demonstrating that its individual dimensions load on the same common factor. The measurement dimensions for each construct will be factor analysed. [Leedy and Ormrod, 2001] [Rose and Sullivan, 1993]

A confirmatory factor analysis was conducted on the 71 dimensions assigned to the TQM constructs, to ensure that the constructs were reliable indicators. A factor loading of 0.50 or greater was considered adequate when interpreting the construct. The results of the factor analysis are summarised in Annexure A and B. As indicated in the Annexure B, only two factors of 0.336 and 0.214, which relates to employee turnover and absenteeism, respectively, are very low factor loading. It is evident that all the other factor loading are very high. This suggests that the factors loaded are acceptable at > 0.50. The two factors with a low factor loading were excluded from the study as it was unacceptable at < 0.50.

6.3 Multiple Regression Analysis

Multiple regression analysis was used in the study to determine the significant variables impacting on organisational performance. The results of the regression analysis showed that the seven TQM practices were statistically significant in explaining the variability of quality improvement, product/service quality, customer satisfaction, employee satisfaction and supplier performance. The decision and outcome of the study was to accept the five hypotheses, as shown in Table. 7:

Table. 7 – Summary of regression analysis

Hypothesis	***R***	***R-squared***	***p-value***	***Decision***
H_1	0.779	0.607	0.000	Accepted H_1
H_2	0.717	0.514	0.000	Accepted H_2
H_3	0.697	0.486	0.000	Accepted H_3
H_4	0.708	0.502	0.000	Accepted H_4
H_5	0.729	0.531	0.000	Accepted H_5

7. Reliability

The reliability of the questionnaire was tested by utilising the Cronbach's Alpha coefficient. Reliability tests were conducted on all the TQM practices as well as all the organisational performance measures that were used in the study. According to [Maree, 2007], the reliability coefficient of 0.70 represents a low reliability, 0.80 a moderate reliability and 0.90 a high reliability. Therefore, a reliability coefficient of 0.70 and higher is considered "acceptable".

Cronbach's Alpha coefficients are shown in Table 8. All the TQM practices as well as organisational performance measures, which constituted this study, had reliability coefficients that were greater than 0.80. Table 8 indicates that the reliability of the questionnaire and the study is fairly high.

Table. 8 – Cronbach's reliability coefficient

TQM practices	***Cronbach's Alpha***
Leadership	0.904
Employee involvement	0.901
Customer focus	0.927
Strategic planning	0.928
Supplier relations	0.866
Process management	0.921
Information analysis	0.912
Organisational Performance	***Cronbach's Alpha***
Quality improvement	0.925
Product/service quality	0.884
Customer satisfaction	0.894
Employee satisfaction	0.840
Supplier performance	0.862

8. CORRELATION ANALYSIS

Pearson's correlation analysis was carried out to determine the relationship amongst the constructs (variables). The result of the correlation analysis is displayed in Table 9.

Table 9 - Correlation matrix of independent variables

TQM practices		***Organisation Performance Measures***				
		Quality improvement	**Product/ service quality**	**Customer focus**	**Employee satisfaction**	**Supplier performance**
Leadership	*r*	0.598	0.544	0.536	0.568	0.337
	p	*0.00	*0.00	*0.00	*0.00	*0.00
Employee involvement	*r*	0.683	0.600	0.593	0.695	0.492
	p	*0.00	*0.00	*0.00	*0.00	*0.00
Customer focus	*r*	0.665	0.627	0.640	0.482	0.548
	p	*0.00	*0.00	*0.00	*0.00	*0.00
Supplier relations	*r*	0.582	0.474	0.463	0.491	0.685
	p	*0.00	*0.00	*0.00	*0.00	*0.00
Strategic planning	*r*	0.697	0.593	0.548	0.535	0.529
	p	*0.00	*0.00	*0.00	*0.00	*0.00
Process management	*r*	0.662	0.585	0.564	0.553	0.558
	p	*0.00	*0.00	*0.00	*0.00	*0.00
Information analysis	*r*	0.542	0.594	0.512	0.430	0.496
	p	*0.00	*0.00	*0.00	*0.00	*0.00

*****Correlation is significant at 0.05 level (1-tailed)

Table 9 shows that there is a significant relationship between:

a) Leadership and quality improvement (r = 0.598, p = 0.00), product/service quality (r = 0.544, p = 0.00), customer satisfaction (r = 0.536, p = 0.00), employee satisfaction (r = 0.568, p = 0.00) and supplier performance (r = 0.337, p = 0.00).
b) Employee involvement and quality improvement (r = 0.683 p = 0.00), product/service quality (r = 0.600, p = 0.00), customer satisfaction (r = 0.593, p = 0.00), employee satisfaction (r = 0.695, p = 0.00) and supplier performance (r = 0.492, p = 0.00).
c) Customer focus and quality improvement (r = 0.665, p = 0.00), product/service quality (r = 0.627, p = 0.00), customer satisfaction (r = 0.640, p = 0.00), employee satisfaction (r = 0.482, p = 0.00) and supplier performance (r = 0.548, p = 0.00).
d) Supplier relations and quality improvement (r = 0.582, p = 0.00), product/service quality (r = 0.474, p = 0.00), customer satisfaction (r = 0.463, p = 0.00), employee satisfaction (r = 0.491, p = 0.00) and supplier performance (r = 0.685, p = 0.00).
e) Strategic planning and quality improvement (r = 0.697, p = 0.00), product/service quality (r = 0.593, p = 0.00), customer satisfaction (r = 0.548, p = 0.00), employee satisfaction (r = 0.535, p = 0.00) and supplier performance (r = 0.529, p = 0.00).
f) Process management and quality improvement (r = 0.662, p = 0.00), product/service quality (r = 0.585, p = 0.00), customer satisfaction (r = 0.564, p = 0.00), employee satisfaction (r = 0.553, p = 0.00) and supplier performance (r = 0.558, p = 0.00).
g) Information analysis and quality improvement (r = 0.542, p = 0.00), product/service quality (r = 0.594, p = 0.00), customer satisfaction (r = 0.512, p = 0.00), employee satisfaction (r = 0.430, p = 0.00) and supplier performance (r = 0.496, p = 0.00).

9. Conclusion

It can be concluded that this study examined the role of TQM in improving and enhancing organisational performance in manufacturing and service organisations in the Johannesburg South region. The TQM practices, were found to have a significant influence on the organisational performance measures of quality improvement, product/service quality, customer satisfaction, employee satisfaction and supplier performance. These findings are also relevant to quality management theory as it highlights the importance of TQM practices on effective quality management implementation which leads to effective organisational performance. The implementation of these important TQM practices in local South African industries needs to be critically addressed.

APPENDIX A – FACTOR ANALYSIS OF TQM CONSTRUCTS

	Factor
Leadership	1
The level of commitment of leadership toward quality is…	0.841
Leadership motivates employees to continuously improve the quality of products/services	0.807
The level of communication of leadership toward employees is…	0.805
Leadership makes employees aware of the importance of customer satisfaction	0.747
Leaders engage the workforce	0.741
Leadership encourage ethical behaviour in the organisation.	0.717
Leaders allocate resources (eg. Time budget) for quality improvement initiatives	0.668
Leadership encourages the participation of suppliers in tackling quality issues	0.606
Employee involvement	
Employees are encouraged to participate in achieving the organisation's quality goals	0.850
Employees are empowered to inspect their own work	0.820

Employees are recognised for superior quality improvement initiatives	0.772
Employee Suggestions are evaluated and implemented	0.742
Employee suggestions are encouraged	0.734
Employees are adequately rewarded for the performance of the work they do	0.715
Employees work in quality improvement teams to solve quality-related problems	0.645
Sufficient resources are available for employees' work skills development and training	0.596
Customer focus	
Customer relationships are improved through customer feedback on product/service quality	0.891
A customer communication channel allows for collection and evaluation of customers' complaints and suggestions	0.870
Customer relationships are evaluated through customer feedback on product/service quality	0.868
Customer feedback is sought, on matters relating to the operations and strategies of the organisation	0.782
Customer satisfaction is the core of the organisation	0.763
Customers' Future expectations are thoroughly analysed through market studies	0.755
Customers' current needs are thoroughly analysed through market studies	0.694
Customers are supplied with information and details on the range of products/services provided by the organisation	0.631
Strategic planning	
Action plans are measured for efficiency and effectiveness	0.916
Action plans produce desired results	0.857
Strategic and operational plans are developed and implemented with a focus on quality	0.814
Strategic and operational plans clearly set out objectives for managers and employees	0.805
Strategic planning addresses the organisation's strengths, weaknesses, opportunities and threats.	0.783
Strategic and operational plans are developed and implemented with a focus on customer satisfaction	0.780
Process management	
There is a degree of innovation in work processes to meet customer requirements	0.929
There is a degree of innovation in work processes to meet key requirements of the organization	0.922
Improvement in work processes leads to better performance through improved products and services	0.801
The organisation designs, implements, manages and improves its work processes to deliver customer satisfaction	0.774
The daily operations are designed to satisfy the requirements of the organization	0.709
Supplier relations	
Our suppliers are dependable	0.887
There is effective sharing of information with suppliers to improve the quality of incoming materials	0.818
Suppliers are involved in the product/service development process	0.795

Long-term relationships with suppliers have been established	0.763
Suppliers are provided with technical assistance, training, and education to achieve quality performance	0.654
Suppliers are provided with clear specifications on the organisation's requirements regarding incoming materials	0.520
Incoming materials from suppliers are inspected for quality and the results recorded	0.500
Information analysis	
Information about quality defects is shared with employees	0.961
Information about quality defects are communicated to employees	0.925
Quality data are used in decision-making, planning and controlling	0.751
Quality data are recorded, tracked, evaluated, and analysed to determine areas for improvement	0.690
How often does your organisation have management review meetings?	0.685

APPENDIX B – FACTOR ANALYSIS OF PERFORMANCE MEASURES CONSTRUCTS

	Factor
Quality improvement	1
Over the last 2 years, the number of defective end products and services has become…	0.896
Over the last 2 years, the number of instances of non-conformance to specifications has become…	0.883
Over the last 2 years, the number of obsolete products and services has become…	0.833
Quality improvement efforts have improved the organisation's competitive position	0.811
The organisation emphasises continual study and improvement of all its products/services and processes	0.792
Product/Service quality	
Products / Services conform to specifications	0.962
Products / Services meet customer requirements	0.821
Products / Services usually have very few mistakes, defects or errors.	0.771
The amount of scrap or waste produced (whether in time, materials or employees capabilities) is continually decreasing	0.708
Customer satisfaction	
Customers are satisfied with the organisation's products/service	0.905
The number of customer complaints over the last 2 years has become…	0.880
Customer evaluation of the organisation's performance has improved	0.834
Existing customers are loyal to the organisation	0.687
Customer satisfaction is the ultimate aim of the organisation	0.644
Employee satisfaction	

Employees are … with the employees' benefits provided by the organisation	0.999
Employees are … with the health and safety rules of the organisation	0.782
The organisation creates an environment that encourages employees to perform to the best of their abilities	0.658
Employees in this organisation are dedicated to their jobs	0.584
Employee turnover is very low, i.e. employees prefer to remain with the organisation rather than work elsewhere	0.336*
Absenteeism i.e chronic absenteeism from work, among employees is low	0.214*
Supplier performance	
Suppliers co-operate with the organisation in resolving quality-related problems	0.841
Suppliers supply products/services that conform to organisational requirements	0.777
Suppliers supply products/services that contain "green" attributes such as recycled/reusable items	0.761
The on time delivery of purchased products from suppliers has increased	0.754

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Biography

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