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A Baseline Assessment of the Total Quality Management Pillars of Commitment to Quality, Customer Satisfaction and Continuous Improvement in a Manufacturing Concern

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ABSTRACT

The study intends to contribute to the field of TQM by exploring the relationship between commitment to quality and continuous improvement and giving emphasis on customer satisfaction on how it acts as a mediator. A survey instrument was adopted from Goh (2000) and used to obtain required information on the independent and dependent variables in assessing the level of TQM implementation in a manufacturing company at Quezon City, Philippines as primary respondents in which data were collected using the online platform. Data were analyzed using Factor analysis and a Partial Least Square Structural Equation Modeling (PLS-SEM) using the SmartPLS 3.0 software for the hypothesis testing and measurement of model fit for the structural model. The questionnaire measures the respondents' perception on rating the company's performance against each pillar with a total of 23 scale items that are rated on a 5-point Likert scale. As a whole, the constructs on customer satisfaction and continuous improvement have a significant relationship. Further research is needed to explore other mediating factors, components, and segments under each construct that are restricted on the instrument. Additionally, management direction in shaping organizational values and establishing a framework to bring about change will encourage all employees to participate in this process and may impact the outcome of TQM success are restricted on the instrument.

INTRODUCTION

History

For many years, organizations have placed a premium on quality. According to Dale (1999), the early focus on quality developed from inspection to quality control and then to quality assurance. During the 1990s, TQM became a widespread phrase among enterprises worldwide. TQM has developed in many countries into a holistic framework (e. g. National quality or internationally recognized awards such as the Deming award, MBNQA, and EFQM) aimed at helping organizations achieve excellent performance, particularly in customer and business results.

TQM has been recognized to play an important role in achieving competitive advantage for organizations (Prajogo, Sohal 2004a, 2004b). Given the importance of TQM, there are not many companies, especially those in the manufacturing sectors, that can afford to ignore TQM (Prajogo, Sohal 2003; Dean, Bowen 1994). As Prajogo and Sohal (2006), and Bolwijn and Kumpe (1990) stated, in today's competitive environment, organizations are required to pursue more complex dimensions of performance, especially in both innovation and quality.

Global Context

To gain and sustain competitiveness in the global market, companies in developed and developing countries need to transform their traditionally bureaucratic style of management to a high value-added and proactive one. For such transformation, the adoption of effective quality strategies and practices is considered as one of the crucial factors-for-success shifts from traditional management to

a TQM culture. It is revolutionary and should come after profound thinking about what is involved during every stage of the transformation. In today's rapidly changing global business markets, organizations are on a quest to determine opportunities, which can provide an edge over competitors. Literature suggests the demand for increased quality is a crucial aspect for organizations to survive in a quickly expanding global market, as quality is vital in securing economic success (Zakuan *et al.*, 2010). In today's global market total quality management is emphasized under three major segments: process orientation, customer orientation, and continuous improvement to meet the needs of all-encompassing customers (e.g., internal customers, external customers, stakeholders, alliances, etc.) (Soriana, 2008).

Organizational change often requires a cultural change to achieve a flexible, dynamic, and adaptable environment, where all organization members participate in problem-solving, value-adding results, and corporate success. (Morgan, 1997). This is where Total Quality Management takes an impact. However, to be successful in the introduction of TQM, many attitudes need changing, thinking developed and perceptions broadened. As a result, standards can be set and organization-wide commitment and continuous improvement realized. The necessary changes will not happen without planned, purposeful action.

Philippine Context

In terms of integration with the rest of the world, and improving the quality and standards of the products, the

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Philippine economy still lags behind other developing economies in East Asia, South Asia, Latin America, and the UAE. Based on the World Competitiveness Ranking 2021 of Switzerland-based Institute for Management Development (IMD), the Philippines ranked 52nd out of 64 countries based on prosperity and competitiveness.

The Philippine manufacturing industry today faces many difficult challenges if they are to survive fierce competition from other international companies. These challenges include being able to sell their products faster, more cheaply, and with a higher level of quality than their competitors. Moreover, Philippine companies generally suffer from a lack of vision, poor leadership, waste of expensive resources, disregard for the potential of human resources as an important agent for change, overlooking customers, and the absence of a scientific, systematic approach towards organizational management. All of these challenges are preventing the country from developing.

In most Philippine companies, a well-structured auditing management system is absent, and no inspection mechanisms exist for the assessment of the quality of products and the services provided. During the 1970s, a lot of money was spent on building up an elaborate infrastructure to facilitate independence in different areas (e.g. food, education, industry, health, and transportation). This effort was unsuccessful because the culture that was needed to change the attitudes of the people towards the new changes was not there. Nowadays, there is an urgent need for a radical reappraisal of traditional management practices within Philippine companies and large-scale change and transformation in the way in which business is done in the Philippine environment, particularly in the area of quality management.

Organizational Context

To address the issues confronting Philippine businesses, Total Quality Management (TQM) may be the key to achieving a competitive edge in today's business environment (Drucker, 2001; Juran, 1995). Company XYZ, the manufacturing company being studied in this research, has been in operation for over 45 years. It initially employed numerous labor workers who design, create, and produce products by hand. This process produces a more finished job but takes more time. Recently, the firm has transitioned toward automation, replacing human labor with machines. As a result, production became more efficient and standardized. It places importance on cost reduction through waste reduction, variation reduction, assisting suppliers in providing high-quality products, and pleasing customers with high-quality goods and services (Deming, 1986; George, 2002; Van Horn, 1997). Almost all of the manufacturing is already standardized. The management is caught between fully removing its labor workers and saving money, or retaining its labor employees and producing more appealing and high-quality items. The issue with standardized processes is the quality control of these manufactured commodities.

Because practically everything is created by a machine, only a small percentage of things are examined before leaving the warehouse. Furthermore, the operation and control of this equipment must be performed and monitored by trained technical personnel. From the conventional manufacturing process, management recognized the relevance of quality management and its potential integration within the organization. This condition provides a chance for the researchers to research this firm as part of their quality management goal.

Research Problem

One focus of TQM is to improve customer satisfaction by having a customer focus and consistently meeting customer expectations. While focusing on the customer is critical to success, it isn't the only factor. A business also has to look within and understand its operations, another important role of its employees in committing to quality. This leads to the pathway of a successful continuous improvement centered around the reworks of processes and effective communication from everyone within the company.

As firms grow increasingly complicated in terms of operations and structure, the researchers want to contribute to the existing body of knowledge by determining how Customer Satisfaction, Commitment to Quality, and Continuous Improvement significantly correlate to facilitate the implementation of TQM especially in the Philippine manufacturing companies and by enabling them to benchmark their progress.

Research Questions

The goal of the study is to determine how commitment to quality can directly influence customer satisfaction and continuous improvement. The mediating effect of commitment to quality to continuous improvement through customer satisfaction was also explored. To successfully deal with the research subject it is necessary to present and answer the following research questions:

1. How commitment to quality may influence customer satisfaction?
2. How customer satisfaction may affect continuous improvement?
3. Does customer satisfaction mediate the influence of commitment to quality on continuous improvement?

Research Objectives

The study intends to contribute to the field of TQM by examining the relationship between customer satisfaction and continuous improvement, as well as emphasizing commitment to quality, to address these research possibilities and gaps. This also tests the null and alternative hypotheses stated in this research. The main objectives of the research are:

- 1) To determine the direct impact of commitment to quality on customer satisfaction.
- 2) To determine the direct impact of customer satisfaction

on continuous improvement.

3) To determine the mediating effect of customer satisfaction in the relationship between commitment to quality and continuous improvement.

Review of Related Literature

There are many different types of TQM practices identified in the current literature including those which are focused on factors such as senior management support and leadership (Talib & Rahman, 2010; Khamalah & Lingaraj, 2007); customer focus, satisfaction, and orientation (Mahapatra & Khan, 2006); employee support, engagement and involvement (Lakhal *et al.*, 2006; Samat *et al.*, 2006); training and education (Ueno, 2008); and continuous improvement (Fotopoulos & Psomas, 2009). Furthermore, a distinction is often

made between these practices into “hard” and “soft” TQM. “Hard” practices are those which are considered to be most pertinent to production and operations management, where statistical techniques or performance standards, for example, are used to assess quality. “Soft” practices, on the other hand, are those which have a more qualitative focus incorporating elements such as leadership, employee involvement, and teamwork (Yunis *et al.*, 2013). According to Khan & Naeem (2018), who examined the impact that soft quality practices have on hard quality practices, found that soft quality practices can lead to improved innovation which in turn impacts organizational performance.

The research carried out in 2006 by Idris and Zairi would help the employers to maintain quality. They have shared that enablers stand for positive energy or force

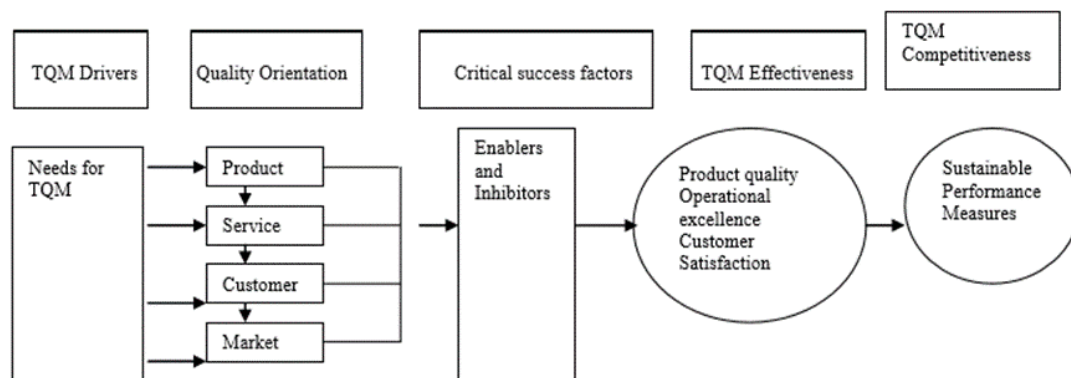


Figure 1: Model of sustainable TQM performance

Source: Idris and Zairi (2006). Pg 1255. *A Synthesis of Literature and Proposed Research Framework.*

in acquiring quality whereas inhibitors lay obstacles in aiming quality. Employers’ harsh practices can demotivate the employees and they won’t perform well and quality could be damaged. Friendly organizational culture can empower employees in achieving the results.

The model has professed the role of management in attaining quality. The model has explained the mechanism for managers and employers on how to motivate and encourage workers to achieve desired actions for profit maximization. The first and foremost thing is that employees should be empowered to work according to their ideas regarding the jobs and tasks assigned to them. They have to carry out the strategic goals in daily business affairs and know the exact demands of their job so they should be given full charge of their work i.e. employee empowerment.

Since its formation, the TQM concept has evolved considerably resulting in the development of a range of models and techniques such as Six Sigma, Kanban, Total Productive Maintenance, Lean, Just-in-time, and Productivity Improvement which are all commonly used today in a range of different settings and industries (Dhongade *et al.*, 2013; Shafiq *et al.*, 2017).

Woo (1993) developed an instrument to measure the levels of Total Quality Management (TQM) implementation in manufacturing organizations. Employees will measure perceptions regarding TQM

as practiced in their organization with an emphasis on what is currently happening in the organization toward quality improvement efforts versus the ideal situation for the organization to improve the quality of its products or services. This instrument contains thirty-eight statements which were developed and modified according to six

Table 1: Summary of Item Specifications

Dimensions	Elements	Item Numbers
Leadership	Commitment to Quality Commitment to Customer Communication Channel	1, 2, 3 4, 5, 6, 7, 8, 9
Customer	Loyalty Satisfaction Feedback	10, 11, 12 13, 14, 15 16, 17, 18
Involvement	Decision Making Information Sharing Participation	19, 20, 21 22, 23, 24 25, 26, 27
Continuous Improvement	Goals Training	28, 29 30, 31
Value of Statistical Methods	Value of statistics as a tool	32, 33, 34
Relationship with Suppliers	Involvement Certification Program	35, 36 37, 38

basic dimensions/elements within the TQM. These are the dimensions/elements of leadership, customer orientation, and involvement covering twenty-seven items, nine items for each dimension. Four items were included for continuous improvement and relationship with the supplier, and three items for the value of statistical methods.

Summary of Item specifications

Today, different industries are adopting TQM philosophy and practice. The manufacturing industry was the first sector to standardize TQM while promoting it across the globe. However, the standardization of TQM in other sectors, such as the service sector is challenging, due to the nature of the value creation process (Alofi and Younes, 2019). Many firms have concluded that effective TQM applications can improve their competitive abilities and provide strategic advantages in the world market.

Conceptual Framework

Figure 2 shows Juran's (1989) road map where the planning process occurs in the quality planning section, in column (B). Quality control column (B) includes the PDCA Control Cycle of daily routine work as well as an overlap on the control aspects of both quality planning and quality improvement. Meanwhile, Column (C) shows Crosby's 14 steps for continuous improvement. Apart from Peach's approach presented above, Juran (1992) offers another view of the relationships of the three major management activities. He sees that management activities pass through four distinct stages.

The first stage is quality planning whereby customer needs are determined; in effect, product features are specified, and the development process fulfills the product feature requirements that meet customer needs. The next stage starts when the plan is given to the operating forces to produce the product. Operations are expected to experience problems and not to achieve a 100% perfect product. In this instance, quality control constitutes an

whilst 'chronic' problems originate from the plan itself, indicating that the product planning itself contains inherent issues. Quality control activities can overcome sporadic problems and prevent things from getting worse. Also, it is expected that small steps of improvement will result from the implementation of quality control. The third stage concerning a dramatic quality improvement is needed to overcome any chronic problems. In the fourth stage, quality control is carried out again with fewer deficiencies and variations in products and processes.

Operational Framework

The link between the three components of TQM, namely Commitment to Quality, Customer Satisfaction, and Continuous Improvement is shown in Figure 2. It is then explored in actuality the relationship between customer satisfaction and continuous improvement, and emphasizing commitment to quality on how it acts as a mediator. These are the study's primary factors, and the

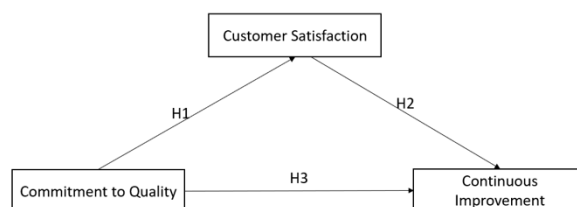


Figure 3: TQM Implementation – Structural model and hypothesis on the baseline assessment of the 3 pillars of the Total Quality Management system in a manufacturing concern.

Source: Agotilla & Agustin, 2021

researchers assess their application in a manufacturing company located in the Philippines. The findings would then demonstrate how these variables influence the operations and whether or not their implementation has an effect on them.

Hypotheses Development

Commitment to Quality and Customer Satisfaction

Anggraini (2014), confirms the influence of commitment to quality on customer erection through customer satisfaction so that the better the service quality is given, the customers are automatically satisfied and loyal. Commitment to quality is an important factor affecting customer satisfaction (Herrmann et. al, 2000). For the survival of today's manufacturing companies, it is very important to exceed customer satisfaction. Activists of quality management say that the goal of customer satisfaction can be achieved by the commitment of top management. The basis of this study is that the adoption of quality management as a competitive strategy by an organization is a strategic decision. The hypothesis is Top management leadership and commitments to total quality principles of participative management are positively associated with employee empowerment. The data were obtained from organizations that were chosen

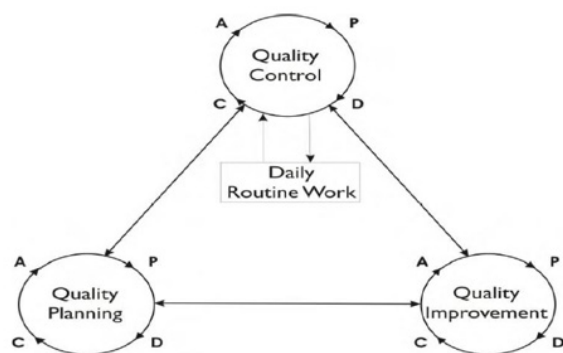


Figure 2: Quality Control Cycles in Management Activities (source: Juran, 1992)

evaluation of the actual performance by comparing it with the quality goals and then acting on the deficiencies. Two kinds of deficiency are expected to occur, namely, 'sporadic' problems, which result from special causes such as a specific machine, material, or employee,

based on their commitment to and implementation of the key elements of quality management. The members who are chosen are those who are responsible for quality management in an organization. Data is collected through questionnaires. Alternative hypotheses were supported by the results. Find the relationship between the top management commitment, employee empowerment, and customer satisfaction (Ugboro IO and Obeng, 2000).

H0a: Commitment to quality is not significantly affecting customer satisfaction.

H1a: Commitment to quality is significantly affecting customer satisfaction.

Customer Satisfaction and Continuous Improvement

A core definition of TQM describes a management approach to long-term success through customer satisfaction. In a TQM effort, all members of an organization participate in improving processes, products, services, and the culture in which they work. TQM requires organizations to focus on continuous improvement.

According to Fryer *et al.*, (2007), the improvement on selective aspects of an organization may cause the improvement to fail to bring overall positive consequences. Their proposition was in line with findings of this study where samples that institutionalize higher intensive continuous improvement gained customer satisfaction that is significantly higher than their relatively less intensive counterparts.

Although the preceding paragraph had discussed that continuous improvement under TQM is a significant predictor of customer satisfaction, previous scholars also reported the contingency factors that may cause the effect of QM on customer satisfaction, such as the issue of flaws in its implementation (Awan *et al.*, 2008).

H0b: Customer satisfaction is not significantly affecting continuous improvement.

H1b: Customer satisfaction is significantly affecting continuous improvement

Commitment to Quality and Continuous Improvement

Quality to commitment is a greater awareness and trust in the importance of greater quality and identification, greater involvement, and loyalty to all practices aimed at achieving quality. Debbie Garvey and Andrea Lancaster (2010) stated that to act like a winner, one must commit to quality.

Goffin & Szwajczewski (1996) asserts that many total quality programs fail because of a lack of commitment. Commitment to quality is a strong indicator of ownership and a major prerequisite for personal and organizational effectiveness. In line with that, the quality commitment illustrates the attachment of employees to quality can be distinguished by certain patterns. Quality commitment is the level at which an employee shows identification with; Deep involvement; and responsibility for quality work. Commitment according to Meyer and Herscovitch is a force that binds the actions of individuals who are relevant to one or more actions.

H0c: Commitment to Quality is not significantly affecting Continuous Improvement through Customer Satisfaction

H1c: Commitment to Quality is significantly affecting Continuous Improvement through Customer Satisfaction

METHODOLOGY

Sampling Design and Research Instruments

In this study, a quantitative research design using a causal research approach was used to assess the relationship among the variables such as commitment to quality, customer satisfaction, and continuous improvement in a selected manufacturing company. The respondents are employees from a manufacturing firm located in Quezon City, Philippines operating for 45 years. The survey was administered on an online platform with a span of 15 days beginning on November 3-18, 2021.

All participants were informed to expect that the data collected from the survey would remain confidential at all times. Personally, identifiable information was not collected. The study was designed to be voluntary and participants could withdraw and discontinue participation at any point. So, at the very least, it was imperative to respect respondents' privacy and to protect the identity of participants by maintaining confidentiality and anonymity.

A survey instrument was adopted from Goh (2000) and used to obtain required information on commitment to quality, customer satisfaction, and continuous improvement. The questionnaire has a scale of 23 items, rates the company's performance against each pillar which comprises questions that are rated on a scale of 1(none); 2(rarely); 3(sometimes); 4(most of the time), and 5(always). The highest rating of 5 is given when the company has attained TQM status.

The adopted questionnaires covered the following segments and factors under each construct to wit; commitment to quality answers the respondent's perception on the management leadership, quality policy, communication, documentation, product design and development, and data control while customer satisfaction answers the respondent's perception on techniques for assessing customer expectations, customer commitment, complaint resolution, and customer relationship and finally, continuous improvement handled questions on programs and seminars, performance trends, areas for improvement, and quality system audits.

Data Collection

The measuring instrument comprised 4 sections (sections A to D). Each was designed to gather a specific set of the required information. Section A was designed to acquire specific demographic information from the respondents about gender, age, job classification, department, and length of employment status. The data obtained from this section of the questionnaire provided informative value for overall research. Section B measured respondents' perceptions on commitment to quality of 11 items scale while section C, customer satisfaction, and section D, continuous improvement has a scale of 6 items each, respectively.

Descriptive Statistics and Distributions

All of the latent variables' means and standard deviations are shown in Table 2, with the means fluctuating between 3.658 and 4.105. Each variable's central tendency is described by the means. The attributes were assessed using a 5-point Likert scale with 11, 6, and 6 items for commitment to

quality, customer satisfaction, and continuous improvement, respectively.

The allowable scales for each attribute are then calculated using the means and standard deviations. The proximity of the means indicates that the answers are consistent. A higher mean implies that more people agreed with the question,

Table 2: Descriptive Statistics of Average Scores (N = 100)

Variables	Mean	SD	Min	Max	Interpretation
Commitment to Quality	3.658	0.756	3.00	5.00	Somewhat disagree
Customer Satisfaction	4.105	0.852	3.00	5.00	Somewhat agree
Continuous Improvement	4.105	0.733	3.00	5.00	Somewhat agree

7.0- Strongly agree; 6.0-6.9-Agree; 5.0-5.9-Somewhat agree; 4.0-4.9-Neither agree or disagree; 3.0-3.9-Somewhat disagree; 2.0-2.9-Disagree; 1.0-1.9-Strongly disagree (Sinaian, 2020).

whereas a lower mean suggests that more people disagreed.

Evaluation of the Measurement Model

As part of the measuring model evaluation, the constructs' validity and reliability are tested. Reliability tests evaluate the research instrument used in a study. Cronbach's alpha (CA) and composite reliability (CR) were both tested in this study. The acceptable coefficient for CA and CR is

0.70 and above (Kock & Lynn, 2012). The values of the average variance retrieved are evaluated as part of the discriminant validity of the measurement model (AVE). The AVEs' values must be greater than or equal to 0.5. (Kock & Lynn, 2012).

For the measurement model to be accepted, both convergent and discriminant validity must be reported. The instrument is said to have discriminant validity when

Table 3: Convergent Validity and Reliability Measures

Variables	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance
Commitment to Quality	Variance	0.959	0.944	0.674
Customer Satisfaction	0.953	0.982	0.961	0.804
Continuous Improvement	0.953	0.984	0.961	0.804

the items or measures of each latent variable are precise in their meaning and well understood by the respondents. All parameters of Cronbach alpha, rho_A, composite reliability, and average variance extracted have met the

requirements. Both Cronbach alpha and composite reliability of commitment to quality, customer satisfaction, and continuous improvement exceed 0.70. The average variance extracted for the three variables exceeded 0.50.

Table 4: Discriminant Validity Using Fornell and Larcker Criterion

Variables	Commitment to Quality	Customer Satisfaction	Continuous
Improvement	0.821		
Customer Satisfaction	-0.073		
Continuous Improvement	-0.139	0.897	0.804

Hence, there is no issue with construct reliability and validity.

The correlation of Commitment to Quality to itself is at

0.821, higher than its correlation to customer satisfaction -0.073 and continuous improvement -0.139. Likewise, the correlation of latent customer satisfaction to itself is 0.897

Table 5: Discriminant Validity Using Heterotrait-Monotrait Ratio (HTMT)

Variables	Commitment to Quality	Customer Satisfaction	Continuous
Improvement			
Customer Satisfaction	0.080		
Continuous Improvement	0.133	0.194	

is higher than its correlation to continuous improvement 0.208. Hence, there is no issue with discriminant validity. Continuous improvement and commitment to quality

with 0.133 HTMT has no issue on discriminant validity as its value is less than 0.05. Likewise, customer satisfaction versus continuous improvement also shows no issue on

Table 6: Discriminant Validity Using Cross Loadings

Variables	Commitment to Quality	Customer Satisfaction	Continuous Improvement
CI1	-0.184	0.191	0.932
CI2	-0.153	0.253	0.907
CI3	-0.149	0.147	0.926
CI4	-0.052	0.208	0.861
CI5	-0.071	0.121	0.870
CI6	-0.092	0.145	0.881

CQ1	0.875	-0.060	0.707
CQ2	0.832	-0.061	0.147
CQ3	0.854	0.000	-0.095
CQ4	0.907	-0.045	-0.144
CQ5	0.924	-0.048	-0.097
CQ6	0.883	-0.058	-0.108
CQ7	0.929	-0.085	-0.099
CQ8	0.917	-0.065	-0.090
CQ9	0.909	-0.095	-0.134
CQ10	0.171	0.067	0.015
CQ11	-0.458	0.046	0.111
CS1	-0.088	0.931	0.209
CS2	-0.063	0.907	0.252
CS3	-0.026	0.924	0.182
CS4	-0.073	0.864	0.175
CS5	-0.068	0.872	0.126
CS6	-0.074	0.879	0.111

discriminant validity (0.914). All figures are less than 0.85, indicating no issue on discriminant validity across the three latent variables.

CI1 to CI6 loadings are higher than its cross loads with the other two latent variables. Likewise, CS1 to CS6 also has higher loadings to itself than the other two latent variables. Also, Commitment to quality latent variable loadings to itself is higher than its cross-loadings with other variables. This implies that there is no issue with discriminant validity.

Evaluation of the Model Fit

For structural equation models, that at a minimum the following indices should be reported: Normed Fit Index (NFI), chi-square, the Geodesic Distance (d_G), the squared Euclidean distance (d_{ULS}), the Standard Root

Mean Square Residual (SRMR), and the RMS Theta.

The results based on the evaluation are NFI=0.640, chi-square value of 1238.855, geodesic distance (d_G) = 3.345, (d_{ULS})=1.735, (SRMR) = 0.079, and the RMS Theta= 0.239.

The good fit for SRMR is expected at 0 - 0.08, while 0 is the perfect fit. In RMS Theta, the measure should be close to zero to indicate a good model fit because it would imply that the correlations between the outer model residuals are very small or close to zero. The results in SmartPLS show that all values were well fit and meet the required confidence interval except for NFI where values should be 0.95 or greater indicating a good model fit.

Evaluation of the Structural Model

The assessment of collinearity, path coefficients of the

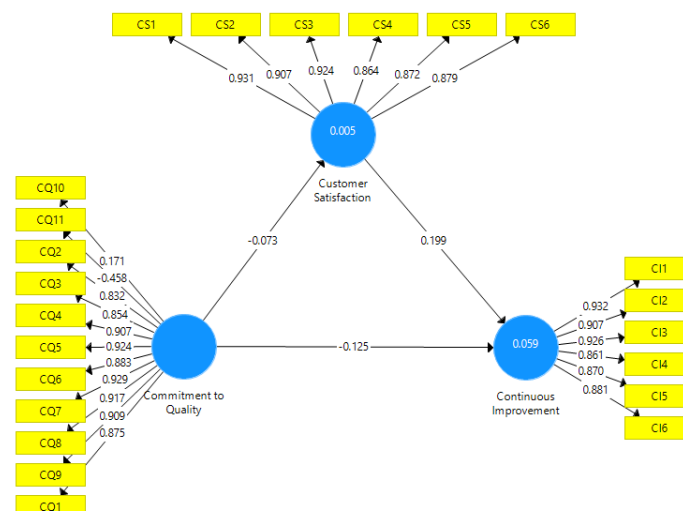


Figure 3: The structural relationship amongst Commitment to quality, Customer Satisfaction, and Continuous Improvement with Parameter Estimates

structural model, coefficient of determination (R^2), and effect sizes are all factors to consider while evaluating the structural model. Figure 3 illustrates the PLS path model.

Direct and Indirect Effects

Table 7 presents the direct and indirect effects of the

partial least square path model. Analysis of the data indicated that customer satisfaction significantly affects continuous improvement. Therefore, H1b is supported. Results also indicated that commitment to quality is not significantly affecting customer satisfaction, therefore H1a is not supported. Further, commitment to quality is not

significantly affecting continuous improvement through customer satisfaction. Therefore, H1c is not supported. Part of the structural model evaluation is the full collinearity assessment. According to (Kock, 2015), the value of full collinearity VIF must be equal to or lesser

than 3.3. In Table 7, the coefficients of full collinearity VIF of characteristics in sports, human development, and peacebuilding are within the acceptable values; hence, the measurement model is said to have no vertical and lateral collinearity. The coefficient of determination or

Table 7: Evaluation of the Structural Model

	β	T Statistics	p-value	Hypothesis
Direct Effects:				
H0a CQ X CS	-0.073	0.554	0.294	Supported
H1a CQ \rightarrow CS	-0.073	0.554	0.294	Rejected
H0b CS X CI	0.199	1.855	0.032	Rejected
H1b CS \rightarrow CI	0.199	1.855	0.032	Supported
Mediating/Indirect Effects:				
H0c CQ X CI X CS	-0.125	0.954	0.170	Supported
H1c CQ \rightarrow CI \rightarrow CS	-0.125	0.954	0.170	Rejected

simply the R-squared (R²) was also assessed.

CQ– Commitment to Quality; CS – Customer Satisfaction; CI – Continuous Improvement.

The Resulting R square implies that changes or variations in

customer satisfaction can be explained by commitment to quality by only 0.5%. Adjusted r square of 3.9% is the amount of variation in continuous improvement that can be explained by commitment to quality and customer satisfaction.

Table 8: Collinearity Assessment and Coefficient of Determination

Variables	Full Collinearity	R2	R2 Adjusted
Commitment to Quality	1.000		
Customer Satisfaction	1.005	0.005	-0.005
Continuous Improvement	1.005	0.059	0.0309

RESULTS AND DISCUSSIONS

The partial least squares–structural equation modeling (PLS-SEM) method was employed with SmartPLS software to estimate the parameters. The PLS-SEM method is very appealing to many researchers as it enables them to estimate complex models with many constructs, indicator variables, and structural paths without imposing distributional assumptions on the data. More importantly, however, PLS-SEM is a causal-predictive approach to SEM that emphasizes prediction in estimating statistical models, whose structures are designed to provide causal explanations (Wold, 1982; Sarstedt *et al.*, 2017a).

Demographic profile of respondents

Demographic characteristics were analyzed via nominal scale frequency distributions to identify the percentage of responses that fell into specific categories. The categories included the following: age, gender, age, department, job classification, and length of employment status. Table 1 presented the demographic profile of the respondents, the majority of whom were males (62%). More than ½ of the respondents were the rank-and-file rater groups with the age 50 years old and below; while the supervisory and managerial groups were more than 46 years old. Moreover, the respondents from the sales and marketing department (31%) were more represented than any of the department counterparts. The majority of the rank-and-file rater groups have been with their company for 5 to 7 years; while the supervisory and managerial groups have been with the company for 11 to 25 years. As a whole, the supervisory and managerial groups are more mature (in terms of age) and tenured (longer service years with

the company) than the rank-and-file rater groups.

The objective of the research is to identify significant relationships on the total quality management system 3 pillars of commitment to quality, customer satisfaction, and continuous improvement as the key areas to successfully implement TQM. Figure 4 presents the mediation model and its parameters.

Commitment to quality is not significantly affecting customer satisfaction as reflected in the path coefficient (beta=-0.073 t=0.554, p=0.294). The results are different from the study conducted by Anggraini (2014) which affirms the impact of quality commitment on customer engagement through customer satisfaction, stating that the higher the service quality, the more satisfied and loyal the consumers are and by Herrmann *et al.* (2000) in which commitment to quality is an important factor affecting customer satisfaction.

Customer satisfaction is significantly affecting continuous improvement. The result of this research showed that customer satisfaction is significantly affecting continuous improvement as reflected in the path coefficient (beta=0.199 t=1.855, p=0.032). The result is the same as the study conducted by Fryer *et al.*, (2007) where he concluded that continuous improvement under TQM is a significant predictor of customer satisfaction and companies that have higher intensive continuous improvement will also gain higher customer satisfaction than their less intensive counterparts.

Commitment to quality is not significantly affecting continuous improvement through customer satisfaction as reflected in the path coefficient (beta=-0.125 t=0.954, p=0.170). The study conducted by Debbie Garvey and

Table 9: Demographic profile of respondents

Age	Project Based	Rank & File	Supervisory	Managerial	Frequency	Total %
25 and below	4				4	4%
26 to 30	1	14			15	15%
31 to 35		13			13	13%
36 to 40		10			10	10%
41 to 45		21			21	21%
46 to 50		10	8		18	18%
51 to 55			12		12	12%
56 to 59				7	7	7%
Total	5	68	20	7	100	100%
Gender	Project Based	Rank & File	Supervisory	Managerial	Frequency	Total %
Female		29	9		38	38%
Male	5	39	11	7	62	62%
Total	5	68	20	7	100	100%
Department	Project Based	Rank & File	Supervisory	Managerial	Frequency	Total %
Audit		7	4	1	12	12%
Finance		15	2	1	18	18%
Human Resource		6	2	1	9	9%
IT		2	2	1	5	5%
Production		9	4	1	14	14%
Sales and Marketing	5	21	4	1	31	31%
Warehouse		8	2	1	11	11%
Total	5	68	20	7	100	100%
Length of stay in the company	Project Based	Rank & File	Supervisory	Managerial	Frequency	Total %
11-15			14	2	16	16%
16-20				4	4	4%
21-25				1	1	1%
2-4		16			16	16%
5-7		26			26	26%
8-10		19	6		25	25%
Less than 2 years	5	7			12	12%
Total	5	68	20	7	100	100%

Andrea Lancaster (2010) stated the high importance of commitment to quality. Commitment if associated with the organization then becomes a continuous process

improvement through the expression of the care of the members of the organization towards the success and the welfare of their organization.

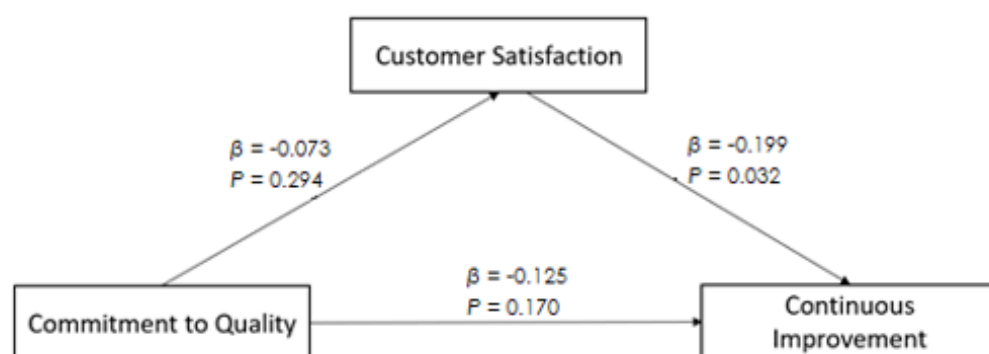


Figure 4: Mediation model with parameter values

CONCLUSIONS AND RECOMMENDATIONS

The constructs on customer satisfaction and continuous improvement have a significant relationship. However, commitment to quality is not significantly affecting customer satisfaction and the mediating effect of commitment to quality is not significantly affecting continuous improvement through customer satisfaction. The survey instrument addresses selected factors and

segments that have yet to be explored and be considered in future studies. As the organization adopts and maintains TQM, doing the surveys regularly will provide a strong indication of staff enthusiasm and commitment levels. The researchers recommend that the company should do this study yearly.

On the quality of the products and services to meet customer requirements, this necessitates a shift in the

company's culture and attitude, as well as management and employee behavior. The company's main focus should be on the customer and their needs. The company's goal is to accomplish these objectives at the lowest possible cost to ensure client satisfaction. Everyone in the firm, from the CEO to the newest employee, must be dedicated to this quality and customer-focused goal.

Management's direction may play a significant role in why certain components are not prioritized or satisfied. They should be the ones to convey the direction that the employees must follow and carry out. TQM focuses on the processes that businesses use to generate their goods, and it requires organizations to define those processes, continually monitor and measure their performance, and utilize that performance data to drive changes. Furthermore, it encourages all employees and organizational divisions to participate in this process.

Limitations and Directions for Future Research

The research is restricted to 100 respondents from a specific manufacturing company in Quezon City, Philippines. Additionally, further research is needed to allow future researchers to add other various components of TQM which may impact the outcomes of its deployment and success. When these restrictions are addressed in future investigations, the outcomes may be different.

The adopted questionnaires covered the following segments and factors under each construct to wit; Commitment to Quality answers the respondent's perception of management leadership, quality policy, communication, documentation, product design and development, and data control while Customer Satisfaction is techniques for assessing customer expectations, customer commitment, complaint resolution, and customer relationship and finally, continuous improvement handled questions on programs and seminars, performance trends, areas for improvement, and quality system audits. The instrument is limited on factors above and segments that have yet to be explored and be considered in future studies. Consideration on incorporating moderating factors such as enterprise resource planning, ISO certification, and so on. The motivations for and obstacles to TQM procedures, as well as the reasons for obtaining ISO certification, may vary in various countries and industries, requiring comparison research to evaluate these characteristics.

An insignificant association between commitment to quality and customer satisfaction may imply the presence of an indirect relationship or any other nonlinear relationship. The lack of a substantial association between certain TQM variables and performance may reflect a mediational relationship between TQM techniques. There might be some mediational links between different performance measurements. It is possible to explore mediating or indirect correlations between TQM techniques and numerous performance measurements.

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