
بسم الله الرحمن الرحيم

Relationship between total quality management (TQM) and continuous improvement of project management in Pakistan (CIPMP)

By

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Certificate

This is to certify that Mr. KAMRAN ARIF has incorporated all observations, suggestions and comments made by the external evaluators as well as the internal examiners and thesis supervisor. The title of his Thesis is: Relationship between total quality management (TQM) and continuous improvement of project management in Pakistan (CIPMP).

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Mr. Saad Ahmad
(Thesis Supervisor)

Dedication

This research work is dedicated to my teachers, friends, family and last but not the least my parents, who have always prayed for my success, guided me and provided me motivation to keep moving forward and exploring new paths.

DECLARATION

It is declared that this is an original piece of my own work, except where otherwise acknowledged in text and references. This work has not been submitted in any form for another degree or diploma at any university or other institution for tertiary education and shall not be submitted by me in future for obtaining any degree from this or any other University or Institution.

Kamran Arif -EM141010

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LIST OF ACRONORMS

TQM …….. Total quality management

CIPMP ……..……. Continuous improvement of project management

LE …… leadership

ER ……..... employee relations

CSR ……..… customer/ supplier relations

PPM…….. product/ process management

IA ……..information and analysis

IP ……..information product

IQ ……...information quality

KM……. knowledge management

CRM …….customer relationship management

CHAPTER 1: INTRODUCTION

1.1 Background

In organizations, vigorous changes are happening at the strategy level in the middle of fast changing globalization. Organizations are directing more towards enhancing their management practices around the world. Same type of management practices cannot select and implement in all organizations that are effective somewhere else. The ability to understand about change in dynamic environment and then proactively manage the problems with the help of continuous improvement practices is important for an organization for their success[1]. Now a days Quality is more focused by the organizations for their survival in competitive environment[2]. It is very popular practice to improve quality by adopting TQM philosophy in organizations to manage operations. Up to now, mixed results are found by the TQM implementations. The relationship between TQM elements positively related with operational performance and improvement of organizational performance is based on the application of the TQM practices [3]. Quality has become one of the important tool to achieve competitiveness.[4]. Customers are responding in their feedback for better quality so that's why companies recognize that they will have to deliver the better quality product and services to sustain in the market place. so, high quality products and services become the key for organization success [5]. During 1980s, quality gurus familiarized the main concepts of TQM and gives an integrated approach for the improvement of product or service quality to compete in market place[6]. Many of the researcher found that the importance of TQM elements in project based organization cannot be deprived of because it is a significant tool for achieving excellence in project quality. A number of firms in Japan and Europe have increased their competitiveness through TQM practices [7]. Firms like Harley-Davidson, Ford, and Xerox are some of them which were facing drop in their position in the market they regain their position but also have increased in market share and profits with implementation of TQM practices. A number of companies also implement the same set of practices and have better their profitability and competitiveness. However, those companies , which overlook the elements of TQM they are still surviving [3]. However, by implementing TQM practices the results in quality improvement are mixed. Furthermore, the continuous attention for implementing TQM practices were in the developed countries like Japan, USA, UK and other countries in European, hence, from the last few years the total quality management in

developing countries is the main studying topic by researchers [8]. In Pakistan organizations start quality improvement programs and some of them are implementing TQM as the quality improvement practices after knowing their effectiveness.

Project management is also increasingly adopted by the companies as a management practice to optimize their time, cost and quality standards. Organizations start and complete projects for achieving their strategic objectives. Project is a temporary task that initiate for a specific purpose and it its outcome is a product or service which is unique in nature, temporary means that the project has a limited time for its completion and unique means it is not a routine task and it is not completed in same functional environment in which other products or services completed. Definition of the "Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements". Requirements of the project are completed through project process and the project process is dividend in to five phases that are initiation, planning, executing, monitoring and controlling and closing[9]. The many of the emerging industries later world-war II are project based. It was very useful to introduce a new management practice, because the projects were extensively used in organizations approach that can resourcefully manage these temporary activities which are critical to achieve organizations strategic objectives. Project management provide the researchers and professionals of the field to develop an approach that can efficiently manage the projects[10]. At the beginning researcher emphasis completely on the implementation of a single project. Project research in general now extents a variety of level of analysis. Researcher change their Concept for improvement in projects management framework, as the management of projects to the management by projects. [9]. Now in less developed countries companies are paying their focus for adopting project management for managing the projects so, in developing countries the implementation of project management techniques and tools are not developed up till now. It is a comparatively modern approach that the efforts to achieve planned objectives within specific time and cost limits, through optimum use of resources and using an integrated planning and control system[11]. Project management has directed so many organizations to be effective and well-organized in delivery of their products and services, to have more correct planning, scheduling and improved productivity. The development and credit of project management is ongoing to growth as resources become rare in less developed countries [8].

Following TQM elements are

- Customer supplier relations
- Product process management
- Leadership
- Employee relations
- Information and analysis

have more significant and positive relationships with the continues improvement of international project management , when compared to TQM elements [12].

1.2 Problem Definition/Research Gap

Organizations are adopting Project management as a management practice in developing countries. To complete their projects the tools and techniques of project management are in their initial phases in developing countries. Several social, political and economic problems take towards poor management performance. Therefore, the strategy of continuous improvement for implementing project management must be focused. Recently, the economy of Pakistan is growing due to new atmosphere in the country. Many large projects are ongoing due to CPACK. However, the project management is newly introduced in Pakistan for managing the large projects. That's why for planning controlling and scheduling there is lack of modern tools, techniques and methods in the field of project management to achieve the strategic goals within time, cost and standards. As a result, the local contractors do not have appropriate resources and skills so they are incapable to complete large projects without foreign organization and they are also unable to appropriately perform their responsibilities regarding rules, specifications and deadlines of project gave to them. There are number of studies performed on the relationship between project success and project management element; there are also ranges of studies performed on the relationship between TQM elements and organization success in terms of performance. However, here are many organizations that have implemented both kinds of management practices. The goal of this research is to find out, how different TQM elements are related to the continuous improvement aspect of project management in Pakistan, collectively and individually.

1.3 Research Questions

These are following research questions:

1. What are the relationships among TQM elements and continuous improvement of project management in Pakistan (CIPMP)?
2. Which TQM element are directly related to continuous improvement of project management in Pakistan (CIPMP)?
3. Which TQM elements are indirectly related to continuous improvement of project management in Pakistan (CIPMP)?

1.4 Significance of the study

To better manage our projects, we need to find out the ways and understand how to improve through continuous of project management in Pakistan. Project Costs are becoming too high so it is important that Project managers should enhance their performance. At the end of the project or during closing stage of project lifecycle, some of the unnecessary or undesired disputes are arise due to insufficient or indifferent quality so that time payment by negotiation, adjudication, or even lawsuit imposes and limits profit potential and a serious drain on the financial resources of a company. This study helps to add in the literature and continuous improvement of project management in Pakistan through the analysis of a large field of TQM practices and project management. Issues are elevated about each of the five elements. Answering the Research questions will contribute for understanding the elements of TQM and the strategic importance of each element for the continuous improvement of project management. Due to limitations of resources this study will help the managers to allocate the resources in right direction that have the most significant effect on continuous improvement. This research is applicable to practitioners because the findings may disclose patterns in the implementation of TQM practices, which may give important information, by using that information managers can solve implementation challenges and maybe to improve quality of projects.

1.5 Research Objectives

Following are the research objectives of this study:

1. To find out the impact of leadership on continues improvement of projects management in Pakistan.
2. To find out the impact of customers/supplier’s relationship on continues improvement projects management in Pakistan.

3. To find out the impact of employee relations on continues improvement engineering projects management.
4. To find out the impact of product/process management on continues improvement engineering projects management in Pakistan.
5. To find out the impact of information and analysis on continues improvement engineering projects management in Pakistan.

1.6 Definitions of study variables

1.6.1 Leadership

The suitable leadership style lead to better results and effective leadership is an important tool to get strategic objectives. Many studies of studies results that the top management leadership is positively related with project success[13]. Some studies showed that the project manager leadership role is critically important for a project to achieve a high level of performance[14].

1.6.2 Employee relationship

Employee relations, including decision making these decisions contribute to improvement only when they are based on accurate quality data [15].Organizations are giving more importance to finding the ways to improve competitiveness and profitability. Fundamental for achieving these objectives is the effectiveness and efficiency of employees. A business looking for improving in performance will use to improve its employee relations in processes. [16].

1.6.3 Customers/suppliers relationship

Customers are the key drivers of the quality and they are critical for firm success. The framework of customer relationship management focuses on customer's expectations that are exceeding day by day and how to meet them. There is different dissemination of customer-related information through the organization like customer complaint resolution and so on. They all enable an organization to make an effective relationship management. Customers are the end users so that's why their feedback is very important for the completion of the projects. Suppliers are also responsible to provide the quality material. Both customer and supplier involvement and their suggestions are very important for continuous improvement. Customer/supplier relationship is positively associated with the continuous improvements efforts [17].

1.6.4 Product/Process management

From the TQM viewpoint, product management and process management go parallel in terms of both elements being a ‘hard aspect of TQM. Therefore, they are combined here as one construct. Improvement made in product design improves process [18].Improvement made in process design improves. Product/process management are positively associated with the continuous improvement.

1.6.5 Analysis and information

TQM emphasize that the decision making should be based on facts, which comprises information to analysis customer expectations, design problems, and the success of improvement activities [19].The scientific and statistical methods allows to provide accurate data and feedback system for continuous improvement efforts in organizations[20].The availability of correct and appropriate quality data is useful for the product design and process design[12].

CHAPTER 2: LITRATURE REVIEW

2.1 Total quality management

TQM can be well-defined as the approved company extensive and plant extensive operational work structure, integrated technical and managerial procedures, documented in effective, for directorial the co-ordinate actions of the people, the machines, and the information of the company and plant in the best and most practical ways to assure customer quality satisfaction and economical costs of quality. Therefore, it can be determined that TQM provide the preferred culture of an organization dedicated to customer satisfaction through continuous improvement. A number of organizations understood that TQM philosophy is the best way for remaining in today's competitive environment. With the help of this approach an organization become a successful "total quality organization". Likewise, it is found many times in the literature that there is significant relationship between organizational competitiveness and TQM practices. Subsequently Total Quality Management noises for continuous improvement, it will be unavoidable that new concepts for keeping innovation and quality will arise to lead organizations to the next century and beyond. Mostly the quality tools related with TQM do not usually produce improvement, but certain implicit behavioral features such as open employee empowerment, culture, and executive commitment can provide better results [21].

In the quality revolution of japan the role of Edwards Deming was prominent. A special program was started in 1980 with the title of "If Japan Can then, Why Can't We?" That program helps to explain people how Deming's contribute in the development of Japanese quality. This program become very famous all over the world its viewers increased exponentially and then the US government documented that quality is serious issue for the country's economic health, the business and industry initiated to focus on quality, [7]. At the start of 1987, the Malcolm Baldrige National Quality Award MBNQA was recognized as a declaration of national committed to deliver quality leadership. Similar quality awards and structures were introduced in other developed countries [1]. In the early days of 1979 the Crosby and Juran significantly worked and provide the conceptual and practical approaches of quality management our work is related to impact of TQM elements for continuous improvements of project management. A

number of researchers studied about TQM elements and project management they have been directed to a debate about the efficiency of TQM elements for continuous improvement.

Joo Y. Jung and Yong Jian Wang investigated the usefulness of the TQM elements for continuous improvements. They were used the survey questioners to an arbitrarily selected sample of 3000 people around the world. A reply rate of 30.9% was realized within the time period of two months. The study results show that the employee relations have the most significant role for continuous improvements. The target population was the managerial level employs of the firms that were involved with international projects conducted between the US and three countries China ,Korea and Japan [12]. The finding of the Black and Porter 1996 they develop a questionnaire with the help of quality management experts and formulate a list of ten factors that are defined as critical to TQM. That methodology was comprehensive and actually comparable to ours. Black and Porter rationally use Eigen values and 'variance explained' criteria to defend their selection of 10 elements, however we have select the four elements of TQM practices associated with continuous improvement[22]. A study conducted by Seraph et al. results shown that they focus on the eight factors, some of them are similar to those of Joo Y. Jung and Yong Jian Wang. However, there is certainly not a clear agreement as to what the 'real' factors of TQM are, and there will have always the differences as to how to define the TQM into elements. we select to use a recognized factor set that contribute in continues improvements[23].

2.2 Leadership

About 80 percent of previous research studies are considered that leadership is an important element in the TQM framework. Top management leadership is responsible for implementing total quality management philosophy in the organizations for continuous improvements [10]. To provide direction for structure and moving toward an improved system leadership is considered as an important tool of TQM for continuous improvement. Leadership is liable for the setting of goals that leads the organization towards increased performance[22]. According to Deming and juran, in the organizations quality issues are not the due to workers, top management leadership is responsible for implementation of quality process. Leadership provides support to deal with problems and for workers to accomplish targets and goals. Moreover, the main objective of leadership is to give support and improve their motivation level to deal with the problematic situations from the front end [13]. The whole project process leadership is a significant factor and with the increasing quantities of global projects the importance of leadership is growing. For

success, leadership and appropriate group environment are required because the people across the globe work collaboratively on meeting project goals [24]. CEO of General Electric used three word letters that are “Don’t manage! Lead!” to emphasis in the project management field on leadership the special skill sets that leaders possesses as opposed to management is in recognition of the need for and bring change. Leaders can see long-term objectives and advancement through innovation. While numerous supervisors are excessively worried with keeping up the norm, the individuals who rise as leader is more worried with making on critical designs, even if they are not famous. From all the project management skills, in the present leadership is one of the significant and is expected to be more critical soon[25]. In order to implement TQM practices for improvement and changing the organizational culture top management commitment role is very important [8].

For successful implementation of TQM through policies and leadership strategy top management element is the first step in quality planning; management by fact; and managing innovation[4]. Management leadership should be conscious about the forthcoming competitiveness that can affect the domestic market appeased through improving both organizational performance and operational performance. it only based on the successful execution of TQM concepts[20]. Top management leadership and involvement is one of the mostly cited critical success factor for project success in the literature. furthermore the previous studies results that top management contribution take part as a vital role for providing the desired conditions that are necessary to enhance project performance[24]. It is believed that the top management involvement improve the project performance by improving the project understanding between their users [14].Why and how the top management influences enhance the project performance? the previous results shows that there are two major factors exist that explain this situation, the role of top management is critical in shaping the environment that is directed towards continuous improvement and provide the circumstances that are helpful to support project success[26].Usually , during the planning phase the role of top management is significant they take part in both the project characterization and project team building.

For project completion resource and funds allocation is the responsibility top management so that’s why the ability to provide conditions that are useful for project success is also the responsibility of top management [27]. However, to improve the motivation level of top managers, it is important that the top management should involve in decisions making and they

should be able to take the critical decisions that essential for key stakeholders and supportive for problem solving. problems occur among the project team or between organizational department[28]. When members of project team recognize that the top management participation, then turn out to be more excited regarding the project and can easily encounter required changes. It can be considered that the Project champions/leaders that enhance the motivation level of project team to perform more than they thought possible[24]. Sometime during project lifecycle, when the high level of risk and complexity involved in the environment then, in order to improve project success, top management involvement could shape the institutional environment. Specifically, when the environment is turbulent and uncertain, at the same time the projects become more difficult to manage and important for firm identity in the competitive environment. In turbulent environments, project managers need to go further than common risks managing roles leaning in the direction of learning and flexibility that are traditionally implemented by top management [9]. When the environment is unstable to manage, the complexity requires top management leadership in different organizational activities that have an impact on one or more than one specific project. The growth of dissimilar approaches for addressing aspects of project associated with uncertainty positioned away from the scope of individual projects[29].

The environment in which the project team works that should be supporting towards continuous improvement so that's why it is the top management responsibility to shape institutional context that leads towards project success. The attitude of CEO is another factor that positively affect the employee perception about the organization support[30]. We cannot adopt the same leadership style everywhere different leadership styles are used that depends upon different cultural dimensions. Moreover, there is no any recommendation in TQM philosophy regarding the use of specific leadership style everywhere. However, there exist so many different leadership philosophies and area of changing leadership style so that's why it cannot be encompass with in appropriate framework of this study [31].

Hypothesis H_1: there is significant and positive relationship between leadership (LE) and continuous improvement of project management in Pakistan (CIPMP)

2.3 Employee relations

Today employees are highly qualified and educated due to fast communication and technological advancement if we compare them with the past so that's why their demand for challenging task are increased due to work place independence, more interesting work and greater participation in the process of decision-making [32]. The organizational performance can be enhanced by employee relations that include promotion of team work, involving them in decision making, proper credit and reward structure between the employees. Management should emphasize on training programs for improvement of worker's skills to achieve proper skilled employees. For continuous improvement, it is necessary to empower and involve employees under these circumstances; if employee takes part in process of change and the work hard. Better quality products are the result of quality management performance and this can only possible if employees are trained in total quality techniques. When employees are involved and confident, then quality based reward structure and approach of open communication can improve the process [12]. At the workplace level, rising practice of negotiating employment agreements means that the employees will be more directly busy in the process of changing or developing new agreements. With the employer, this might occur if they are necessary to discuss individual employment conditions directly. If not, they can use their freedom of expression through vote for the acceptance of new contract on the behalf all employees in the organization. In some circumstances, employers are willing to achieve specified objectives or they want to put efforts for better productivity. In return, want some improved wages or other incentives, so to achieve these objectives process may involve employees taking to adapt existing work performs [33]. The meaning of Employee involvement is that every employee should not considered as a part of machine, they are viewed as unique human beings and employee should take part to meet organization objectives. Management should ask and valued the opinion of each employee. It should have observed by management and employees every individual employee is involved in toward achieving specific business objectives. Employee involvement is basically involving employees for better productivity and other organization objectives while on the other hand the meaning of employee empowerment is identification of problems and complications of process and providing their solutions by management and employees for completing goals of an organization. To continuously improve performance employee empowerment that management should identify the ability of employees and provide them appropriate required authority and tools to solve the problems. The management positions its opportunities about employees identifying

and resolving problems, and authorizes them to do so. The people are most important for every organization. Manager cannot improve productivity and performance without their support to get competitive advantage organization must emphasize on trainings and managing the people to improve skills and abilities that helps for continues improvement [26].

Organizations find it difficult to stay competitive in recent global economy. Importance of employee development program is growing for the organizations those pursuing to achieve an advantage among competitors. Employees are valuable resource of the organization and success or failure of the organization relay on the performance of employees. Therefore, organizations are financing large amount on employee training and development programs. It is supportive for companies to emphasis on knowledge, expertise and ability of employees. There is considerable discussion among professionals and researchers on the affect that development program has on both employee and organization[34]. In large organizations relationship between top management and employees is not as much suitable and due poor employee- management relationship job satisfaction level is also lower. Moreover, results show that organizations are trying to recompense for their size through usual negotiations of endorsement promise, training requirements and issues related to pay. For managers, these results have significant policy implications in the employee- management relations. By improving the employee- management relationship not only improves employee job satisfaction level but it also reduces turnover and increase productivity. [32]. High motivation level is considered as a driven force for achieving preferred goals and objectives. To understand how employees can become motivated and what things motivate them, it is necessary to measure their motivation level. In addition, that managers should understand that what are the roles and responsibilities that motivated their employees to make employees productive and effective in their performance. Now a days, The primary focus of manager in human relation approach management is motivation of employees [33]. There is so many research studies conducted that shows that, to gain better profitability and competitive advantage human resources is the central element for organizational success[10]. To attract, hold, mature, and motivate the aptitude of employees the organizations should adopt human resource management (HRM) at strategic level. The experienced works are the assets of an organization so human resource management focus improving their job satisfaction level by attracting and motivate them through different incentives and retain the knowledge workers [16]. Every firm wants to maximize their performance through skilled employees. To get experienced

and skilled employees firms offer the better financial correspondences to pull the staff from their competitors [35].

Today, numerous analysts concur that the human resource function is one of the most significant components in an organization's success. HRM is evidently being changed in organizations and regularly confirming its strategic part. According to project management body of knowledge(PMBOK) HRM is the one of the fundamental element of project management [10].

Hypothesis H_2: there is significant and positive relationship between employee relations (ER) and continuous improvement of project management in Pakistan (CIPMP)

2.4 Customers/suppliers relationship

The firms in which main focus is customers they are basically different from traditional organization. In a traditional association, all the decisions are based on cost and productivity improvement and these are the main objectives and firm drivers. Customer satisfaction is the main objective in customer based organizations and all the action are completely based on customer expectations. Customer's expectation is the key to improve customer satisfaction to get competitive advantage by providing customized products. Before taking any decision about designing of new products or services, organizations must include customer expectations that are listed as a result customer feedback system [15]. The employee relations examined in this review incorporate an variety of organizational development techniques to simplify changes such as employee contribution in decisions team work and the use of effective communications to create an awareness of organizational goals .These organizational development techniques, by and large considered the most relevant human resource practices in organizations that make successful utilization of TQM [12]. Customer focus is the core principle and idea of TQM because quality effort comes of customer's needs and ends with customer's acceptance[36]. Customer Relationship Management (CRM) is a phrase that describes how your business interacts with your customers. Most people think of CRM as a system to capture information about your customers. However, that is only part of the picture. CRM involves using technology to gather the intelligence you need to provide improved support and services to your customers. In other words, CRM is also about what you do with that information to better meet the needs of your existing customers and identify new customers, resulting in higher profits for firms[37]. Mostly authors find out that the Customer satisfaction was the most important considering it as a

core factor responsible for TQM implementation and success. It refers to the ability and success of an organization to understand the expectations/needs of its customers and exceeding these expectations the first time and every time[38].

The core of TQM is the customer-supplier involvement in both externally and internally, and at each interface there are number of processes involved. This core must be surrounded by Commitment to quality, communication of the quality message, and recognition of the need to change the culture of the organization to create total quality. These are the foundations of TQM, and they are supported by the key management functions of people , Processes and systems in the organization[39]. An organization must ensure quality at all stages of manufacturing. As such, an effective supplier quality management approach should form the basis for procuring quality parts. The suppliers' role is critical in many ways. First, the quality of incoming parts from suppliers determines the level of inspection efforts of a buyer organization. Second, the quality of the supplied material, to an extent, determines the final product quality. Third, supplier's capability to react to a buyer needs, in turn, can determine the buyer's flexibility in responding to the customers' needs[40]. TQM drew the attention of management to the importance of the quality of incoming materials, parts and services, and made supplier relationships a major component in attaining competitive advantage[40]. Furthermore, vendors knowledge and experience have been found valuable during the design of new products and in achieving higher quality and faster responses to market needs[12].

Hypothesis H_3: There is significant and positive relationship between customer/ supplier relations (CSR) and continuous improvement of project management in Pakistan (CIPMP).

2.5 Product/Process management

Both process management and product management are the organizational efforts that contribute to the quality of processes and product. While both are different in their objectives of continuous improvement, techniques and visibility but they relatively considered same for successful implementation of TQM. Improvement in processes and techniques of manufacturing are attempts in the process management and design management efforts gives the improvements in product design. Process management is usually more visible hitherto planned and design management efforts involve long-term background work. Finally, they involve different technical and managerial tools [18]. The process quality management is the focus of modern

quality view but the traditional quality view focused was the products not the process. In the TQM framework, process management and product management are considered same because they are more technical and related to hard aspect TQM so they are combined in the same construct in this study. Advancement made in product design improves process design. Enhancement made in process design enhances product design. The use of quality data and reporting system enables organizational improvement based on scientific statistical methods. For product design and process design the existence of timely and accurate quality data is a required [12]. At every stage of supply chain, there exist a number of processes in parallel such as, production, selling, procurement, logistics, service, inventory and so on. Each of the process has its own objective and independent program. High quality in the processes provide a vital role in reduction of waste, small variation and more increment through the total quality control and continuous improvement in all of the supply chain system nodes[21]. Many authors of TQM framework suggest that through Process management firms achieve total quality excellence. It includes the procedures and systems for founding quality in the many shop floor activities involved in manufacturing. Management pay lot of attention on process management because it uses a number of tools and techniques like statistical process control, Taguchi techniques, Total Productive Maintenance and resources management. Another important practice is the design of a production process that affect the competitive capabilities and internal quality performance[36]. The quality can be improved and controlled during the process. The Process management deals with the delivery requirements and integrates production that includes relationship management with the suppliers. Reengineering and redesigning through the process help many firms to enhance their performance and make continues improvement in quality.

Hypothesis H_4: There is significant and positive relationship between product/ process management (PPM) and continuous improvement of project management in Pakistan (CIPMP) .

2.6 Information and data Analysis

The field of information quality and data analysis provides important outcomes just a few years ago, Despite just solving the problems related to information quality, practitioners and researchers focus on problems related to improvement of methods, tools, processes, measurements and analysis [41]. During processes inputs are transformed into outputs. So, at the input end, information about customer's expectations, raw materials and resources required for product or service are needed. TQM, KM are process of transforming set of inputs like raw

materials and plant equipment, methods and procedures, knowledge and information, employees and their skills. To meet the customers' expectations and needs the transformed outputs are services, products and lesson learned. To achieve quality improvement and improved productivity the concepts of Knowledge management and total quality management are efficiently included into quality management processes. By integrating KM concepts into the TQM process organizations can achieve competitiveness. quality information availability ,Information management, information analysis, communication and quality information usage are the concepts of KM that are positively related with continuous improvements of process[42]. Organizations have to consider information as a product that passes through different stages of information manufacturing system. Information product exhibits a unique nature to understand much like a physical product. The consumers of information product are the most likely to find the problems from the information that they use, mainly contextual information quality. It is not the responsibility of consumers to identify and resolve information product problems. The quality of information product must be improved proactively by product team. when information quality policy is the main commitment of top management than through information product firms gain competitive advantage and attain strategic goals that must control the full potential of their data [43]. Information, management and data analysis provide solutions for numerous managerial responsibilities, mainly in the investment decision making. This specific field help out significantly in working out the set of systemic recommendations for the solution of different complex and critical managerial functions[44]. Effective communication system supports to simplify and disseminate all compulsory project information and status to all external and internal project stakeholders[45].

Hypothesis H_5: There is significant and positive relationship between information and analysis (IA) and continuous improvement of project management in Pakistan (CIPMP).

2.7 Continuous improvement of project Management in Pakistan (CIPMP)

Continuous improvement can be defined as the continuous incremental innovation and wide process focused of a company. Continuous improvement is the thinking of improvement initiatives for minimizing the failure and maximizing success rates. For effectively managing internal processes and improving the product quality without losing view of external elements

such as needs relentless, competition effort in continuous improvement. Continuous improvement is based on assessment of existing quality management practices and processes. The size of quality issues and in which area improvements/attentions are required is identified through a proper way of evaluation and understanding of processes. For evaluating the performance of processes and quality management practices, firms required to gather diverse information related to quality of differing cost of quality and internal operations. The process is capable to meet the meet the production requirements are ensured with quality-related information. Accurate documentation of a variety of process and procedures is compulsory for reducing likelihood of operator error. Quality control (QC) tools, sampling and inspection methods, Plan-do-check-action (PDCA) cycle and statistical process control are used for continuous improvement [46]. In today's dynamic environment of market to achieve competitive advantage it is essential to provide customized products of better quality. Project Costs are becoming too high so it is important that Project managers should enhance their performance. At the end of the project or during closing stage of project lifecycle, some of the unnecessary or undesired disputes are arise due to insufficient or indifferent quality so that time payment by negotiation, adjudication, or even lawsuit imposes and limits profit potential and a serious drain on the financial resources of a company. Now is the time to replace the traditional management approach to managing projects. Produce better quality work by developing more direct relationships with stakeholders and promotion of team work at the job site. Such goals required continuous improvement of project management to recognize within the company in order to provide desired quality in projects. Recently all the concepts of continuous improvements are stated as Total Quality Management (TQM). TQM concept must be understood and applied to an organization to meet stakeholder's requirement that is the primary objective. The project management provides service to its owners/customers that are demanding higher quality and better value addition with lower costs. Organizations adopt the philosophy of Deming's wheel – Plan-do-check-act (PDCA cycle) for continuous improvement of the quality of their product and service for the reduction of cost and increasing the customer satisfaction. The effective implementation of TQM practices will increase the overall performance of an organization, which comprises a total organizational approach for meeting customer needs and expectations that involves all managers and employees in using quantitative methods to improve continuously the organization's processes, products and services [2]. Organizational Performance is related with continuous improvement (CI). The best way to improve the organizational performance and

output is the TQM philosophy [47]. By adopting the concepts of TQM for continuous improvement of project activates desired quality of projects can be achieved. The integral part of TQM and continuous improvement is the customer satisfaction. Basically, the values that confirm commitment to customer satisfaction, it is argued that those values are the main drivers of continuous improvement. The concept of continuous improvement is discussed in number of frameworks that considered for success [48].

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter includes research model, research design, population and sampling techniques, research instruments and data analysis & tool.

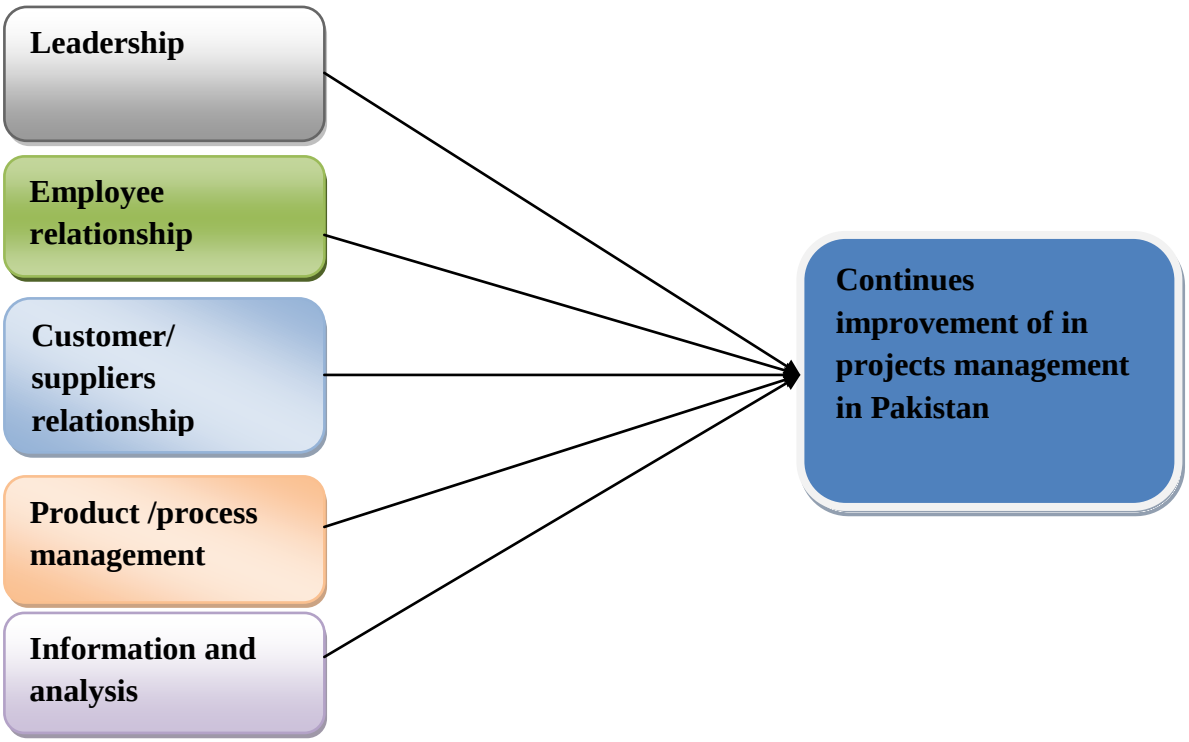
3.2 Research model

3.2.1 Independent variables (IVs)

There are five total quality elements (TQM) elements that are used as IVs that are leadership, information analysis, employee relations, customer supplier relations and product/ process management.

3.2.2 Dependent variable (DV)

Only one independent variable is used that is continuous improvement of project management is Pakistan (CIPMP).



$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + e$$

This equation is our model equation that shows y is the independent variable CIPM. Dependent variables are $x_1$is leadership, x_2 is employee relationship x_3 is customer/ supplier relationship, x_4 is product/ process management and x_5 are information and analysis. Similarly, b_1, b_2, b_3, b_4 and b_5 are the coefficients respectively and e is the error term.

3.3 Research Design

3.3.1 Type of Study

This is a causal study where the total quality management factors like leadership, customer/supplier relationship, product/process design, employee relations and information analysis are used as DVs (dependent variables) to find out the impact on one IV (dependent variable) that is continues improvement of project management.

3.3.2 Study Setting

In the current study participant's, are from the organization's that have currently ongoing projects in construction industry, telecommunication and NGO'S projects and all the participants that were selected they are involved in the project up to some extent. They have working background in different projects.

3.4 Population and sampling techniques

To estimate the characteristics of the entire population through sampling researcher take a subset of population. That subset is the representative of the entire statistical population. The main objective of sampling is to reduce cost and time while estimating the characteristic of the entire population. The convenient sampling was adopted and appropriate numbers of questionnaires based on the population size were distributed among the managerial level employs of different companies who are working experience in different projects. Most of the researcher follows self-administered questionnaires as survey technique because it is self-explanatory and cost effective way to collect relevant information. Furthermore, because this technique is cost effective it has advantage of less interference of researcher, therefore reduces the possible bias from the participant. This technique helps the respondents to respond in the questionnaires at ease and allows them to take their time for justified and well thought response. The population of the current study comprises of the all the employees working in project management offices and they have background working experience in projects based organizations. They are also currently

working on different projects in construction industry, telecommunication and NGO'S projects in Faisalabad, Lahore, Islamabad and Rawalpindi. Mostly, project managers, program managers, engineers, executives, consultants and assistant managers are involved in this study as sampling members.

3.5 Research Instrumentation

The methodology that is used to conduct this study is based upon on-site surveys and questionnaires are used to collect information, thus a mix of self-administered and personal approach was used to perform this research. It was thus required to personally visit PMO of each company that is involved in different projects. In a single visit it was requested to fill this questioner and provide them hard copies. At start of questioner a brief note was given to develop the trust and inform that these questions require answers based on your experiences in your current job. Your answers will be kept strictly confidential and will be used only for research purpose. Your identity will be not disclosed on this document so kindly give an honest opinion to make this research unbiased. At any point in time you can quit and are not bounded to answer. But still it will be honor for me that your opinion takes part in my research work.

After that required information was divided into seven sections of different type of questions.

1. First Section consist of demographic information of the respondents like gender, age, working experience, educational level and present position in an organization in which they are working.
2. Section 2 questions are related to leadership, organizational culture, and top management commitment.
3. Questions that are asked in third section are related employee relations that are basically to find out the level of employee responsibility for error-free output, quality awareness among employees, employee involvement programs, effectiveness of those programs and feedback system.
4. All the questions about customer/supplier relations are covered in third section. This section emphasizes the level of importance of customer requirements and their satisfaction. Employee certifications based on quality also analyzed.
5. Main focus in section five was the improvement of process and product design.

6. The entire questions asked in this section are related to information and analysis. These questions are about to investigate use of lesson learned from previous projects, availability of information, information system and to communicate information through effective communication system.
7. Section seven contains questions related to continuous improvement of project management.

All Questions that were used to collect information from respondent were taken from the scales developed by D. Samson& M. Terziovski, J. Carlos Bou-Llusar, Hale Kaynak, Kristy O. Cua & Kathleen E. McKone and Joo Y. Jung [15][1][23][6][20].

The response rate was 82.5%. Data was collected by using the questioner of 5 points Likert scale in which 1to 5 represent from strongly disagree to strongly agree. There is no or minimal research interference and this research is based on field study. The questioner consists seven sections, first sections include five demographic questions and other 33 items are divided in six sections. Total 300 questioners were distributed from which 235 return back. Total 213 questioners were completely responded and 22 were incomplete. Information that was provided by respondents encoded to analyze through SPSS software and multiple regression and correlation analysis were performed.

3.6 Data analysis procedure and tools

All the data that is received from respondents through questioner is analyzed by using SPSS (Statistical package for social sciences) software. This software is used to process, manipulate and analyze complex data related to social sciences, engineering and medical sciences. To analyze data following tests are performed:

- Reliability analysis
- Descriptive statistics
- Correlation Analysis
- Regression Analysis

3.6.1 Reliability analysis

Mostly internal consistency ("reliability") of scale is measured by Cronbach's alpha when multiple Likert questions are used in a questionnaire and to determine the scale is reliable or not. The study computed separate and combined reliability estimate, which are similar normally used alpha statistics. The value of alpha should be greater the 0.7 for acceptance. If the alpha value is greater than 0.8 that is good and if this value is above 0.9 it is excellent.

3.6.2 Descriptive statistics

To describe the basic features of data in the study descriptive statistics was used through SPSS. For the description of central tendency commonly used method is mean calculation. In descriptive statistics, standard deviation is also calculated which is more detailed and accurate estimate of desperation.

3.6.3 Regression analysis

In simple linear regression, there exist a relationship between one independent variable and one dependent variable. But when two or more independent variables are used to predict a dependent variable then, multiple regression analysis is used. Through Multiple regressions it is possible to determine the relative contribution of each of the independent variable to the total variance explained and overall fit (variance explained) of the model. So, that's why in this study multiple regression analysis is used to find out the contribution of IVs towards DV is significant or not.

3.6.4 Correlation Analysis

There are so many variables are used in a scale but to find out the relationship between two variables correlation analysis is used. This relationship can be positively correlate, negatively correlated or no correlation between variables. The result output values of correlation analysis are between -1 to 0 and 0 to 1. If the value is between 0 to 1 then both variables are positively correlated and between 0 to -1 represent that they have negative relationship.

CHAPTER 4: RESULTS AND ANALYSIS

4.1 Introduction

This chapter consists of results and analysis of data. To analyze data that was collected from all the respondents was coded and input in to SPSS (Statistical package for the social sciences) software. The main purpose for using this software as a tool to analysis data was to perform essential primary analysis and additional analysis for example descriptive, correlation, linear regression and multiple regression analysis. The main objective of this study is to find out the impact of TQM constructs on CIPMP.

4.2 Normality tests of Data.

Before running statistical analysis methods, it is assumed that the dependent variables are approximately normally distributed for independent variable. According to this assumption, each variable and the combination of all variables are normally distributed. For this purpose, following numerical and visual outputs are investigated:

- Histogram
- P-P plot
- Q-Q plots
- Box plots

- Skewness & kurtosis

Data Histogram is showing that it has approximately Symmetrically bell shaped curve on regression standardized residual and as per normal probability plot a reasonably straight line shows normal distribution. Skewness and kurtosis values for each variable are in between the span of -1.96 to 1.96 that is desired range for normality. Normal Q-Q plots of all the valuables are showing that all the responses are approximately distributed along the line. Box plots are also symmetrical. (All box plots, histogram, Q-Q plots, P-P plots and Skewness & kurtosis are listed in the appendix B)

4.3 Demographics

All the information about respondents is covered in this section, although this data is not fundamental to the study. This part of research work contains the Information about respondent's gender, age, level of education, years of experience in particular field, designation and type of an organization in which they are working.

4.3.1 Respondent's Gender

Out of 213 numbers of responses there are 180(84.5%) males and 33(15.5%) are the female's respondents that were asked about their gender.

4.3.2 Respondent's Age

The respondents were asked about their age in numbers and after that through SPSS software that numbers were converted into ranges. The ages ranges from less than 30 to above 50, with the majority being less than 30 (123, 60.1%), 63(29.6%) belong to 30 to 40 years age range, 18 (8.5%) belong to age range of 41 to 50 years, whereas, 4 (1.9%) are more than 50 years of age. All the information is given in the table 4.1.

4.3.3 Respondent's Experience

The respondents were asked about their year of experience in that particular field in numbers. After that through SPSS these numbers are categorized in to ranges with the step size of 4 years. Out of 213 respondents, 56 (26.3%) were from first category that have 1 to three years of experience, 99 (46.5%) were from second category that have 4 to 6 years of experience, 36 (16.9%) were from third category, 13 (6.1%) were from fourth category and 9(4.2%) were from

the last category. It was observed that majority were from 4 to 6 years of experience. (As shown in the table 4.1)

4.3.4 Respondent's Educational Level

The respondents were asked about their educational level. Out of 213 respondents, only one was a doctor (PhD's), 45 (21.1%) were holding MS/M.Phil. degree, 148 (69.5%) were having master's degree and 19 (8.9%) were holding bachelor's degree. This was observed that majority of the respondents were holding their master's degree (as indicated in table 4.1).

Table 4.1 Demographics

		Frequencies	Percentage
Gender	**Male**	180	84.5%
	Female	33	15.5%
Age(years)	**20-30**	128	60.1%
	31-40	63	29.6%
	41-50	18	8.50%
	Above 50	4	1.90%
Qualification	**Graduation**	19	8.90%
	Masters	148	69.5%
	MS/M.Phil.	45	22.1%
	PHD	1	0.50%
experience (years)	1-3	56	26.3%

	4-6	99	46.5%
	7-9	36	16.9%
	10-12	13	6.10%
	13 **or Above**	9	4.20%

4.3.5 Respondent's Job Level

The respondents were asked about their job level as well. Majority of them were engineers (77, 36.2), 46 (21.6%) were project managers, 31(14.6%) of them were assistant managers, 22(13%) were executives, 7(3.3%) were program managers, whereas, 14(6.6%) of them didn't mentioned their job level (as indicated in table 4.2).

Table 4.2 Respondent's Job Level

Job level	**Frequency**	**Percentage**
Assistant manager	31	13.4%
Engineer	77	36.2%
Project manager	46	21.6%
Program manager	7	3.3%
Executive	22	10.3%
Consultant	16	7.5%
Don't mention their job level	14	6.6%
Total	213	100%

4.3.6 Respondent's Organization type

The respondents were asked about the type of an organization in which they are currently working. The results in table show that the information is gathered from construction industry, telecommunication and NGOs. The participants that were involved in the research process are 90(42.3%) from construction industry, 94(44.1%) are from telecommunication and 29(13.6%) are from NGOs. Most extreme respondents were observed from telecommunication industry. (As shown in the table 4.3)

Table 4.3 Organization type

Organization type	Frequency	Percentage
construction industry	90	42.3
telecommunication	94	44.1
NGOs	29	13.6
Total	213	100

4.3.7 Summary of descriptive

This part covered the respondent gender, age, experience, educational level, their job level and the name of organization they are working in. Most of the respondents were females (105, 52.5%), majority of respondents were less than 30 years (89, 44.5%), most of them have experience of 6 to 10 years (77, 38.5%), majority were holding master's degree (106, 53%), 77(36.2%) were engineers whereas, most extreme respondents were observed to be from telecommunication.

4.4 Reliability Analysis

In reliability analysis, Chronbach's Alpha is most accurate measure of reliability scale or analysis. The value of alpha for all items of questionnaire along with the five variables is shown in the following table. We can see that from the results that the value of Chronbach's Alpha is greater than 0.7, which is referred as an acceptable range.

Table 4.4 Reliability Statistics – All Items

Cronbach's Alpha	N of Items
.923	33

Table 4.5 Statistics – Single Construct

	Variable	Construct	Factor loading	Internal consistency reliability (Cronbach's Alpha)
1	LE_1	Leadership	0.634	0.711
2	LE_2		0.630	
3	LE_3		0.692	
4	LE_4		0.713	
5	LE_5		0.636	
6	ER_1	Employees relations	0.701	0.717
7	ER_2		0.716	
8	ER_3		0.689	
9	ER_4		0.674	
10	ER_5		0.678	
11	ER_6		0.673	
12	ER_7		0.670	
13	ER_8		0.703	
14	CSR_1	Customer/ supplier relations	0.705	0.752
15	CSR_2		0.715	
16	CSR_3		0.702	
17	CSR_4		0.697	
18	CSR_5		0.717	
19	PPM_1	Product/ process	0.674	0.742

20	PPM_2	management	0.693	
21	PPM_3		0.700	
22	PPM_4		0.680	
23	PPM_5		0.734	
24	IA_1	Information & analysis	0.668	0.765
25	IA_2		0.697	
26	IA_3		0.733	
27	IA_4		0.731	
28	CI_1	Continuous improvement	0.704	0.759
29	CI_2		0.697	
30	CI_3		0.745	
31	CI_4		0.735	
32	CI_5		0.735	
33	CI_6		0.729	

Table 4.5 shows factor loading of each variable in every construct and the alpha value of overall construct is 0.923 which is greater than the required level. Apart from overall construct reliability, Single construct wise reliability was also checked and for the clarity the reliability was 0.711, Leadership, employee relations, customer supplier relations, process/ product management, information & analysis and continuous improvement shows reliability of 0.717, 0.752, 0.742, 0.765 and 0.759 respectively.

4.5 Descriptive Analysis

In descriptive analysis, we can observe the value of mean & standard deviation between them. The mean value shows consensus among population that, information & analysis having higher impact on CIPMP with the mean value of 3.62. However, customer/supplier relations, leadership, employee relations and process/ product management shows positive impact on

CIPMP and their mean values are 3.56, 3.47,3.55, 3.44, and 3.84 respectively. Standard deviation shows the average degree or level to which data deviate from its mean value. The larger value of standard deviation means that the observations are more spread out, as in the case of information & analysis value of 0.84 which shows that data is more spread out whereas employee relations has the least spread out observation with the value of 0.60 The findings among respondents that CIPMP is highly affected by these five independent variables. All the independent and dependent variables with their respective mean and std. deviations are shown in the table 4.6.

Table 4.6 Descriptive Analysis

Construct	N	Minimum	Maximum	Mean	Std. Deviation
Leadership	213	1	4.80	3.47	0.72
Employee relations	213	1	4.75	3.55	0.60
Customer / supplier relations	213	1	5	3.56	0.75
Process / product management	213	1.6	5	3.44	0.77
Information & analysis	213	1.5	5	3.62	0.84
Continuous improvement	213	1	4.83	3.84	0.68

4.6 Correlations Analysis

Correlation is a measurable strategy in which data is examined via a formula which helps to describe the relationship between selected variables and also determines the nature of the relationship between them. Following are the results of correlation are given in table 4.7.

Table 4.7 Correlations

	Leadership (LE)	Employee Relations (ER)	Customer / Supplier relations (CSR)	Product/ process management (PPM)	Information & analysis (IA)	Continues improvement of project management (CIPMP)

Leadership (LE)	1					
Employee Relations (ER)	.535**	1				
Customer/ supplier relations (CSR)	.585**	.484**	1			
Product/ process management (PPM	.549**	.492**	0.655**	1		
Information & analysis (IA)	.504**	.444**	0.628**	0.692**	1	
Continuous improvement of project management	.581**	.452**	0.598**	0.629**	0.696**	1

Table: Pearson Correlation among Variables

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Analysis:

The results show that Leadership was positively correlated with CIPMP with a value of .581, Employee Relations is also positively correlated with CIPMP with .452and Customer/ Supplier relations, process/product management and information & analysis are also positively correlated with CIIPMP with a value of 0.598, 0.629, and 0.696 respectively. All vales are significant at the level of 0.01 (2 tailed)

Regression Analysis:

Regression analysis measures that how much independent variable is positively and significantly linked with dependent variable. In regressions when we know how all the four variables used in this research are linked with the dependent variable, after that we can easily get the information about independent variables.

As this research, we have explored the impact of TQM elements on CIPMP. The regression method was used for hypothesis testing. A linear regression analysis is used in this research to analyze the hypothesis.

4.7 Multiple Regressions Analysis:

The most common type of linear regression is multiple regressions. This analysis helps to explain the relationship between dependent variable from two or more independent variables. Also, we can accept or reject or hypothesis on findings of multiple regression analysis. For linearity, main hypothesis was tested. $\mathbf{H_1}$, $\mathbf{H_2}$, $\mathbf{H_3}$, $\mathbf{H_4}$ and $\mathbf{H_5}$ are tested by applying multiple regression analysis. The data is presented in the following table showing that all the five-main hypothesis are supported.

Table 4.8 Regression Results for Main Hypothesis

a. Dependent Variable: CI

b. Predictors: (Constant), LE, ER, CSR, PPM and IA.

Analysis of variance

	Sum of squares	df	Mean Squares	F	Significance
Regression	2042.010	5	408.402	56.503	.000
Residual	1496.196	207	7.228		
Total	3538.207	212			
Standardized confident of independent variable	Unstandardized coefficients B	Beta	Significance	Co-linearity statistics tolerance	VIF
(Constant) LE, ER, CSR, PPM, IA.	1.032				
LE	0.206	0.218	0.000	0.549	1.821
ER	0.038	0.034	0.552	0.643	1.556
CSR	0.096	0.105	0.117	0.456	2.191
PPM	0.126	0.143	0.043	0.416	2.406
IA	0.327	0.406	0.000	0.461	2.171
Coefficient of determination					
Dependent variable	Multiple R	R^2	Adjusted R^2	Standard Error	N
CIPMP	0.760	0.577	0.567	2.68849	213

- **H_1** : Leadership is positively related to CIPMP

$$y = a_1 + b_1 x_1$$

Eq. (4.1)

$$CIPMP = \mathbf{1.032} + (0.206)LE$$

Eq. (4.2)

It means that leadership is explaining 20.6% of positive variance in CIPMP. The value of F change is 30.764 which shows that model is fit

- **H_2** : Employee relations are positively related to CIPM

$$y= a_2+b_2x_2$$

Eq. (4.3)

$$\text{CIPMP}= \mathbf{1.032}+(0.038)\text{ER}$$

Eq. (4.4)

It means that Employee relations is explaining 3.8% of positive variance in CIPMP. The value of F change is 30.764 which shows that model is fit.

- **H_3** : customer/ supplier relations are positively related to CIPMP

$$y= a_3+b_3x_3$$

Eq. (4.5)

$$\text{CIPMP}= \mathbf{1.032}+(0.096)\text{CSR}$$

Eq. (4.6)

It means that goal clarity is explaining 9.6% of positive variance in CIPMP. The value of F change is 30.764 which shows that model is fit

- **H_4**: Product/ process management is positively related to CIPMP.

$$y= a_4+b_4x_4$$

Eq. (4.7)

$$\text{CIPMP}= \mathbf{1.032}+(0.126)\text{PPM}$$

Eq. (4.8)

It means that product/ process management is explaining 12.6% of positive variance in CIPMP. The value of F change is 104.056 which shows that model is fit

- **H_5**: Information & analysis is positively related to CIPMP.

$$y= a_5+b_5x_5$$

Eq. (4.9)

$$CIPMP= \mathbf{1.032}+(0.327)IA$$

Eq.(4.10)

It means that information & analysis is explaining 32.7% of positive variance in CIPMP. The value of F change is 56.5 which shows that model is fit

4.8 Multiple Regression Equation:

$$y= b_0+b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + e$$

Eq. (4.10)

$$CIPMP= \mathbf{1.032}+0.206\ (LE)0.038\ (ER) + 0.096\ (CSR)+ + 0.126\ (PPM) + 0.0327\ (IA) + e$$

Eq. (4.11)

=1.032+ 0.794 (independent variables)

In the second stage of the analysis, multiple regressions were applied using SPSS software after linear regression in order to analyze the cumulative effect of all variables in CIPMP. The above table shows the correlation value of all independent variables (employee relations, leadership, customer/ supplier relations, information & analysis and product / process management) and dependent variable (CIPMP). The tables show a positive correlation between the variables with

0.76 and it can be said that the total variability or total contribution of the independent variables is 0.577 or 57.7% with error value 0.45. In case of elimination of error the adjusted R square is shown as 0.567 or 56.7% which is significant.

4.9 Comparison of linear and multiple regressions:

It is important to note that the analysis was done in stages, in stage one individual linear regression was applied on each independent variable and in second stage multiple regressions was used. The results of both analysis are different because of the contribution of the independent variables towards the project success. The linear regression results show a correlation value of .581 (LE) .452 (ER), .598 (CSR), .629 (PPM), (IA) 0.696 and R square values of 0.337, 0.204, 0.357, 0.396 and 0.484 respectively. While applying the multiple regressions, the results show significant improvement which is 0.760 (correlation) and R square of .577 and Adjusted R square of 0.567. The multiple regression result show a huge improvement in the equation and it can be said that the combination of all independent variables is positively affecting the CIPMP.

CHAPTER 5 Discussion, Recommendations and Conclusion

5.1 Introduction

All the results that are listed in previous chapter they will be discussed in this chapter. This chapter contains study overview, discussion and findings, limitations and recommendations of the study. Future directions are also discussed in this study.

5.2 Brief over Review of the Study

The study is conducted to find out the impact of TQM elements on continuous improvement of project management in Pakistan. To make the theoretical grounds for the study literature review was done. There are 39 items in the questioner from which 6 were related to demographic information. In the previous research, all the dependent's variables (LE, ER, CSR, PPM and IA) have strong impact on organizational performance and continuous improvement. Different project based organizations from telecommunication, construction industry and NGO'S were selected for study population. Response rate was 82.5%. To draw conclusions data was analyzed using SPSS 21 version. To find out the impact of TQM elements (LE, CSR, ER, PPM, and IA) on continuous improvement of project management in Pakistan was the main purpose of this research study. Moreover, this study directed towards understanding that these elements are valid and reliable for continuous improvement of project management in Pakistan. The research results of study confirm that TQM elements have a significant impact of continuous improvement of project management in Pakistan. Furthermore, correlation analysis results show that all the

independent variables are positively related with dependent variable but some of them are not significant because p>0.05 (see Table 4.7).

The first hypothesis (H_1) states that there is significant and positive relationship between leadership and CIPMP. H_1 shows that there is significant relationship between both variables according to Pearson's correlation. The second hypothesis (H_2) states that there is significant and positive relationship between employee relations and CIPMP. H_2 and H_3 are not supported significantly. The third hypothesis (H_3) states that there is significant and positive relationship between CSR and CIPMP. The hypothesis (H_4) states that there is significant and positive relation between PPM and CIPMP. This hypothesis is supported. The fifth hypothesis states that there is significant and positive relationship between information & analysis (IA) and CIPMP. H_6 is supported by Pearson's correlation test.

5.3 Discussion and Findings

The main purpose for conducting research study was to find out the impact of LE, ER, CSR, PPM & IA on CIPMP. Through five research hypotheses this research question was described. The main research question of this study was concerned with the relationship between TQM elements and continuous improvement. Results shows that all five TQM elements have a positive relationship with continuous imprudent. But two of the elements are not significant

5.3.1 Hypothesis (H_1)

Hypothesis H_1 states that there is significant and positive relationship between leadership (LE) and continuous improvement of project management in Pakistan (CIPMP). The correlation analysis shows that value of $R=0.518^{**}$ that suggest that both of the variables are positively related with each other. Likewise, according to regression analysis results indicated that leadership is the significant predictor of continuous improvement (CIPMP) because that P=0.00 and coefficient B is 0.206. Hence, hypothesis 1 is supported. So, to the question: is there positive and significant relation between leadership and continuous improvement of project management in Pakistan? The answer is yes, leadership has a positive and significant relation with CIMPM. The top management leadership has a largest impact in continuous improvement of project management in Pakistan The strategic factors of TQM practices like top management leadership, top management commitment are related largely and have a strong impact on

organizational performances[20]. Top Management leadership promise to quality through strategy and vision, quality culture, and quality performance objectives, will help continuous improvement international project management [12].

5.3.2 Hypothesis (H_2)

Hypothesis H_2 states that there is significant and positive relationship between employee relations (ER) and continuous improvement of project management in Pakistan (CIPMP). The correlation analysis shows that value of $R=0.452^{**}$ that suggest that both of the variables are positively related with each other. Likewise, according to regression analysis results indicated that employee relations (ER) is the significant not predictor of continuous improvement (CIPMP) because that P=0.552 that greater than the threshold value ($p< 0.05$) and coefficient B is 0.038. Hence, hypothesis 2 is partially supported. So, to the question: is there positive and significant relation between employee relations and continuous improvement of project management in Pakistan? The answer is employee relations have a positive relation with CIPMP but that relation is not significant. Higher the degree of employees training, employee involvement and employees empowerment have greater their impacts on operational performance[20]. Investment made in employee satisfaction, employee development and training programs, providing work environment safety and flexibility to the employees, can make important influence to continuous improvement of international project management [12].

5.3.3 Hypothesis (H_3)

Hypothesis H_3 states that there is significant and positive relationship between customer/supplier relations (CSR) and continuous improvement of project management in Pakistan (CIPMP). The correlation analysis shows that value of $R=0.598^{**}$ that suggest that both of the variables are positively related with each other. Likewise, according to regression analysis results indicated that employee relations(ER) is the significant not predictor of continuous improvement (CIPMP) because that P=0.117 that greater than the threshold value ($p< 0.05$) and coefficient B is 0.096. Hence, hypothesis 3 is partially supported. So, to the question: is there positive and significant relation between employee relations and continuous improvement of project management in Pakistan? The answer is employee relations have a positive relation with CIPMP but that relation is not significant. To confirm the quality of material and involve suppliers in quality improvement programs organizations directly work with their suppliers [36]. The key element of the quality management is the meeting the customer's requirement for their satisfaction because

customers are main drivers of the quality improvements. Customers satisfaction plays a vital role in improvement of firms performance[2].

5.3.4 Hypothesis (H_4)

Hypothesis H_4 states that there is significant and positive relationship between product or process management (PPM) and continuous improvement of project management in Pakistan (CIPMP). The correlation analysis shows that value of $R=0.629^{**}$ that suggest that both of the variables are positively related with each other. Likewise, according to regression analysis results indicated that product or process management is the significant predictor of continuous improvement (CIPMP) because that P=0.043 that is less threshold value ($p< 0.05$) and unstandardized coefficient B is 0.126. Hence, hypothesis 4 is supported. So, to the question: is there positive and significant relation between product or process management and continuous improvement of project management in Pakistan? The answer is yes, product or process management have a positive and significant relation with CIPMP. product/process management helps to continuously improve international project management it is considered one as the 'hard TQM' element to make contribution towards achieving CIIPM [12].

5.3.5 Hypothesis (H_5)

Hypothesis H_5 states that there is significant and positive relationship between information & analysis (IA) and continuous improvement of project management in Pakistan (CIPMP). The correlation analysis shows that value of $R=0.696^{**}$ that suggest that both of the variables are positively related with each other. Likewise, according to regression analysis results indicated that information & analysis (IA) is the significant predictor of continuous improvement(CIPMP) because that P=0.00 that is less threshold value ($p< 0.05$) and un-standardized coefficient B is 0.327. Hence, hypothesis 5 is supported. So, to the question: is there positive and significant relation between information & analysis (IA) and continuous improvement of project management in Pakistan? The answer is yes, information & analysis (IA) have a positive and significant relation with CIMPM. Data analysis is the vital support in the continuous improvement of quality[22]. in order to attain strategic goals and competitive advantages organizations in the 21st century requirement harness the full potential of their data gain competitive advantage and attain strategic goals [41].

Chapter 6

5.4 Limitations of the Study

There exist some limitations in the current study which are as follow.

- The perceptional data provided by managerial level employees working in project management office is used which may not provide the clear measure of continuous improvement of project management. Therefore, to overcome this problem multiple research methods should used for data collection in future if further research is done on this topic.
- In the current study data was collected from a few companies that are running their projects and generalized to the all projects in Pakistan.
- To conclude the research the cross-sectional data does not provide complete inferences to the researcher.
- Due to privacy policy and busy schedule some employees were reluctant to respond. It increases the difficulty level for researchers to complete unbiased results.
- About 84.5% was male while 15.5% were female so, heterogeneity among the gender is also a limitation.
- No personal interview was conducted for this purpose data was collected by using questionnaire.

5.5 Recommendations

There is a need of future research due to these limitations that are indication in previous paragraph. some of the recommendations are listed for better results:

- The reliability and validity of our CIPMP and TQM constructs is high but still need for improvements so in Future research can be done by including more TQM elements and categorizing them into strategic and tactical factors and then find out the impact on CIPMP. That may give a more detailed and clear understanding about which element contribute more in continuously improving project management.
- For better results, further study can be done in only project based organizations.
- Multiple data collection methods (detailed interview) should be used in future for better results that provide more clear understanding.
- For future study, data should be collected on different time intervals of project life cycle.
- If only project managers and program managers are include in the study as respondents that are certified as PMP or other project management certifications that enhance and enrich the understanding of relation between variables to give better results in Pakistan.

5.6 Conclusion

The relationship between the TQM elements and the continuous improvement characteristic of project management in Pakistan is explored in this research study. The main conclusion of this study is that 'hard' and 'soft' TQM elements both have positive relationships with the CIPMP some of the TQM elements are not significant and have less explanatory power for continuous improvement. The study proposes that information & analysis elements are the most impact elements towards achieving CIIPM. Investment made in information management systems and their development can make a significant contribution to CIIPM. Leadership is the second largest contributing element in CIPMP. Top Management leadership for quality promise to quality through organization-wide quality culture, vision and strategy and quality performance objectives, will help CIPMP. However, the comparison of the 'hard' TQM elements suggest that 'information and analysis(IA)' and 'product/process management(PPM)' are the more contributing elements then customer/supplier relations(CSR) in Pakistan. CSR also have direct contribution but less than the other hard TQM elements. From the 'soft' TQM elements leadership and employee relations both of the elements have direct contribution towards CIPMP. but top management leadership is contributing more than employee relations. In Pakistan organizations are adopting project management to achieve their strategic objectives and they are paying more attention to optimize their resource therefore they should have to adopt the total

quality management philosophy and not just focusing on hard TQM elements while on the other hand soft TQM elements are also important for continuous improvements to get best management practice.

5.7 Managerial implications.

Firms need to enhance their quality through decision makers and managers. This study has shown that the leadership, product /process management and information sharing & data analysis are the main factors that have greatest impact on continuous improvement of project management in Pakistan. On the other hand, the impact of employee relations and customer supplier relations are positively related but not significant relation with independent variable. These finding will help managers to optimize firm's resources by allocating them in the right directions. From applied viewpoint of study, it provides manager to have a clear understanding about which soft and hard TQM element have more contribution for continuous improvement project quality element and critical for project success in Pakistan. In this study results show that not just only soft issues have more importance hard issues have equal importance for continuous improvement. Therefore, for successful implementation of hard quality management managers should also consider that development in soft quality management issues would support. Top management leadership and employee relations relation are the soft quality management issues that gives the base for successful implementation of product/ process management, information quality system and customer/ supplier relationship. Both hard and soft practices should work in every section's day-to-day work and implanted into everyone's attention for effective application of quality management.

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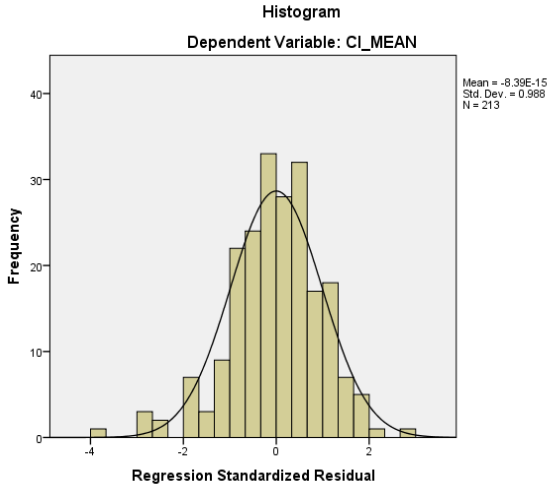
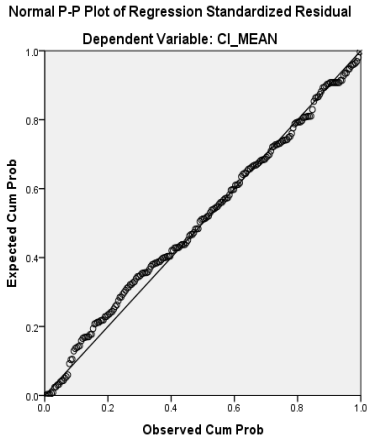
Appendix A

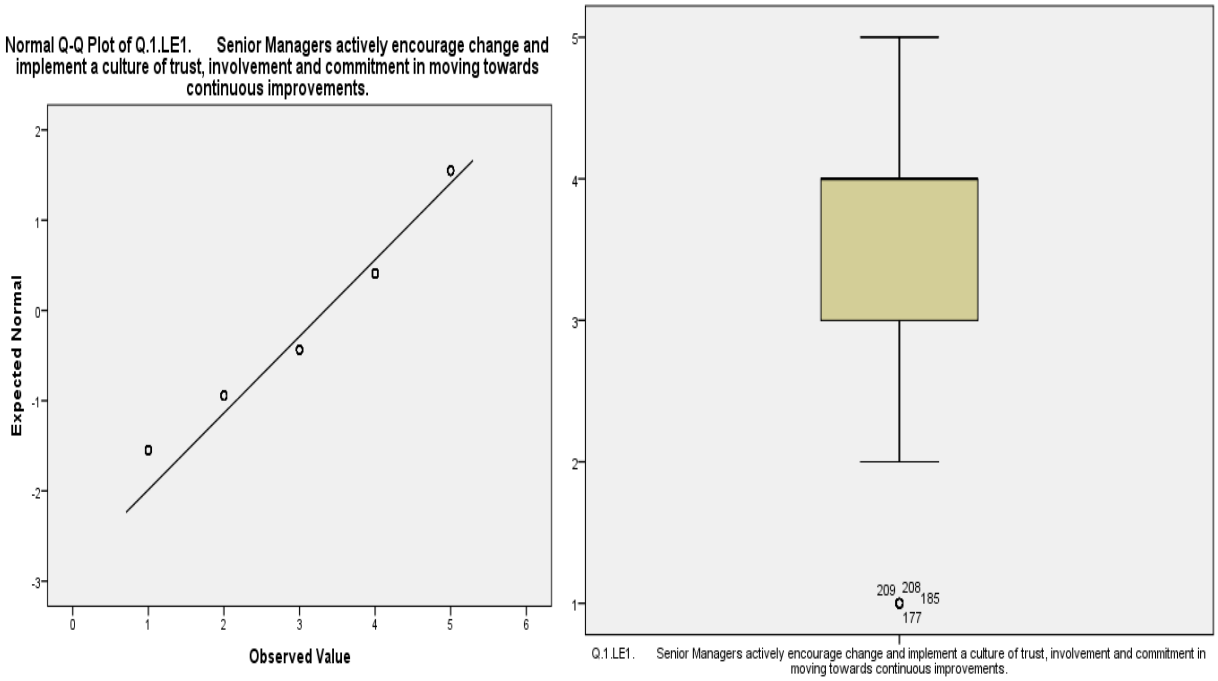




Variable	Skewness	Std. Error of Skewness	Kurtosis	Std. Error Kurtosis
LE_1	-0.684	0.167	-0.437	0.332
LE_2	-0.452	0.167	-0.263	0.332
LE_3	-0.499	0.167	-0.053	0.332
LE_4	-0.598	0.167	-0.91	0.332
LE_5	-0.838	0.167	0.189	0.332
ER_1	-0.287	0.167	-0.578	0.332
ER_2	-0.799	0.167	0.094	0.332
ER_3	-0.687	0.167	0.001	0.332
ER_4	-0.982	0.167	0.737	0.332
ER_5	-0.531	0.167	-0.206	0.332
ER_6	-0.507	0.167	-0.293	0.332
ER_7	-0.609	0.167	0.025	0.332

ER_8	-0.834	0.167	0.594	0.332
CSR_1	-0.757	0.167	-0.192	0.332
CSR_2	-0.290	0.167	-0.423	0.332
CSR_3	-0.533	0.167	-0.415	0.332
CSR_4	-0.646	0.167	-0.378	0.332
CSR_5	-0.686	0.167	0.239	0.332
PPM_1	-0.545	0.167	-0.69	0.332
PPM_2	-0.219	0.167	-0.643	0.332
PPM_3	-0.276	0.167	-0.641	0.332
PPM_4	-0.637	0.167	-0.458	0.332
PPM_5	-0.786	0.167	-0.110	0.332
IA_1	-0.679	0.167	-0.278	0.332
IA_2	-0.761	0.167	-0.203	0.332
IA_3	-0.505	0.167	-0.392	0.332
IA_4	-0.644	0.167	-0.304	0.332
CI_1	-1.125	0.167	1.166	0.332
CI_2	-1.145	0.167	1.855	0.332
CI_3	-0.876	0.167	0.617	0.332
CI_4	-0.789	0.167	0.364	0.332
CI_5	-0.885	0.167	0.644	0.332
CI_6	-0.745	0.167	0.152	0.332

Question #01 Q-Q plot and Box plot



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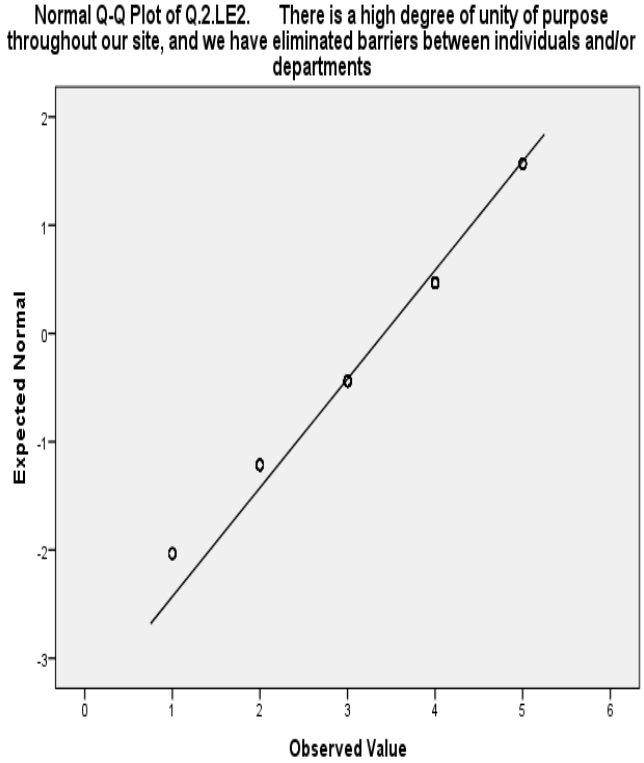

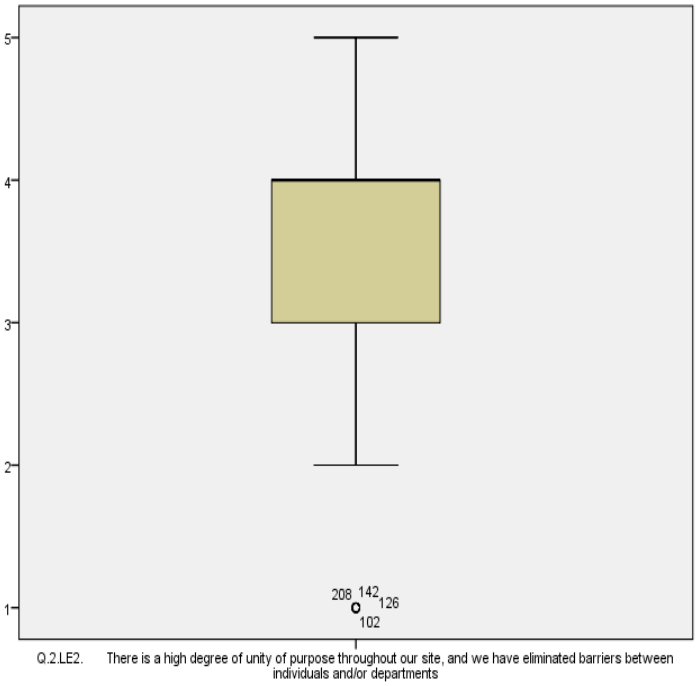

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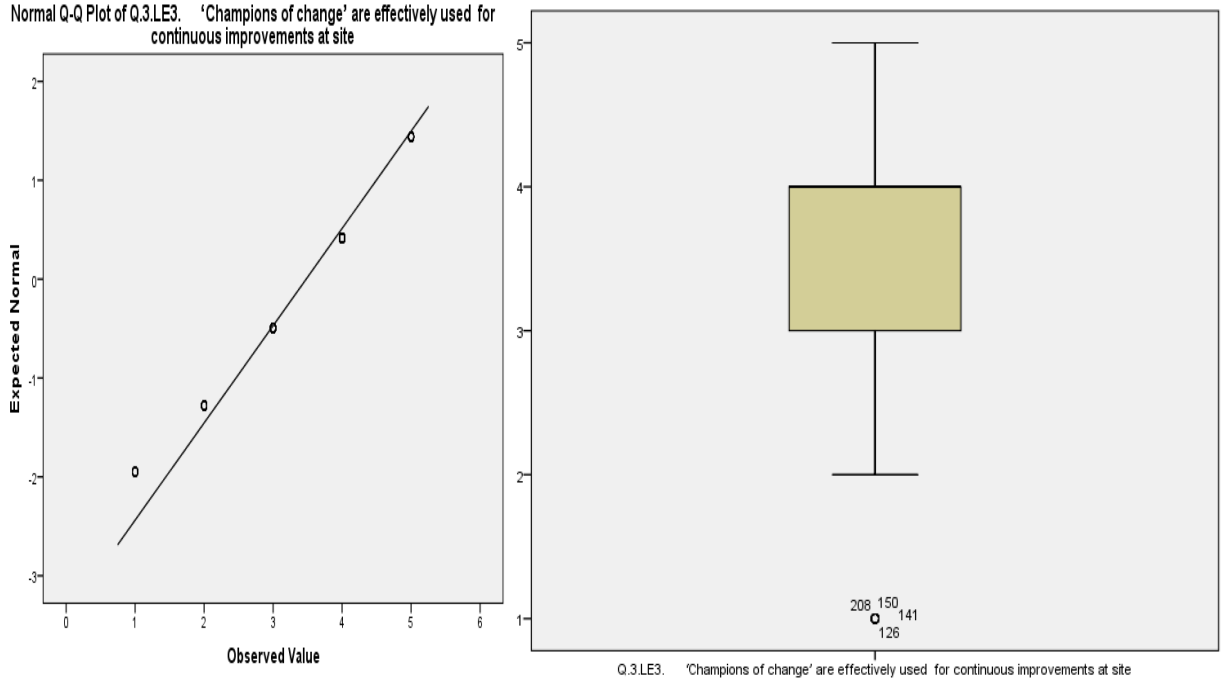

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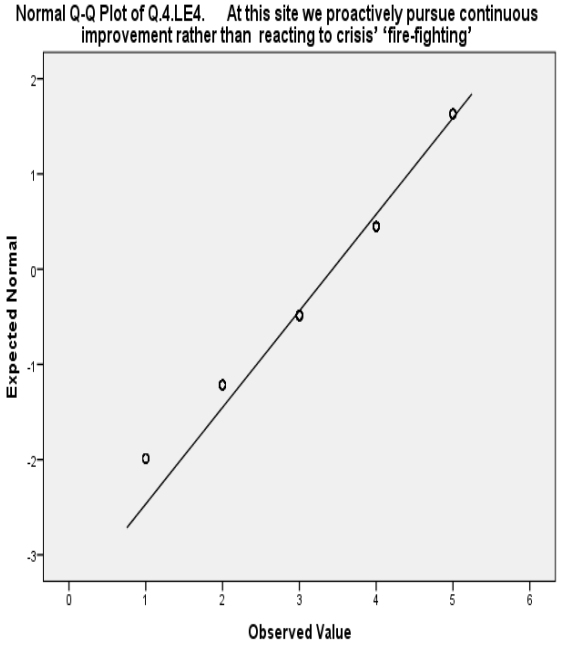

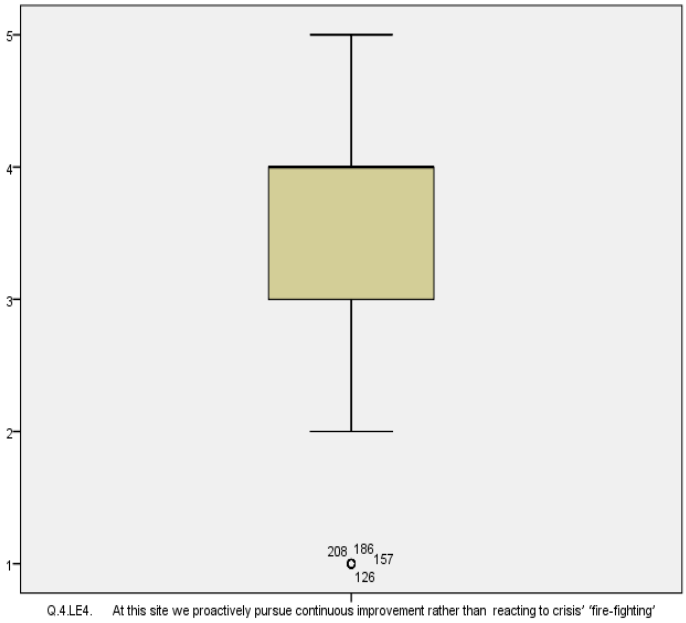

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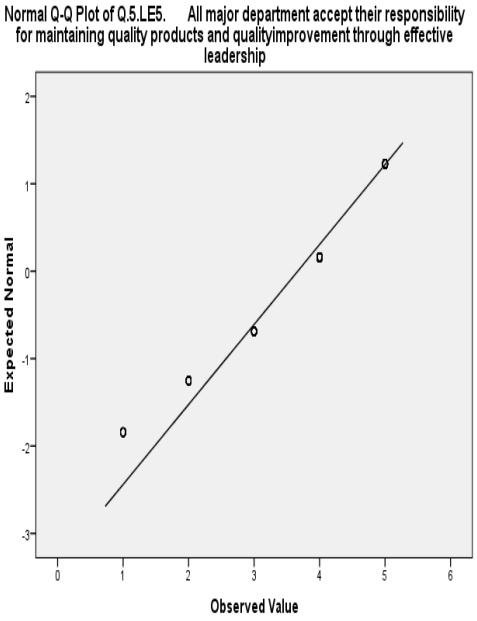

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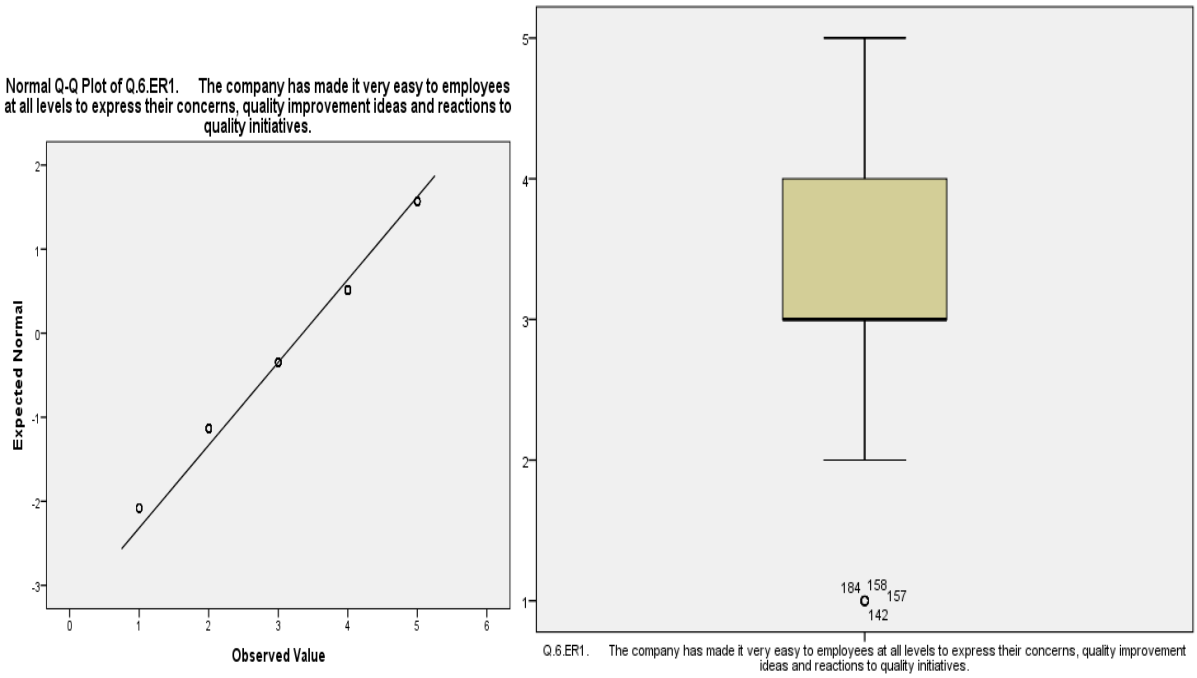

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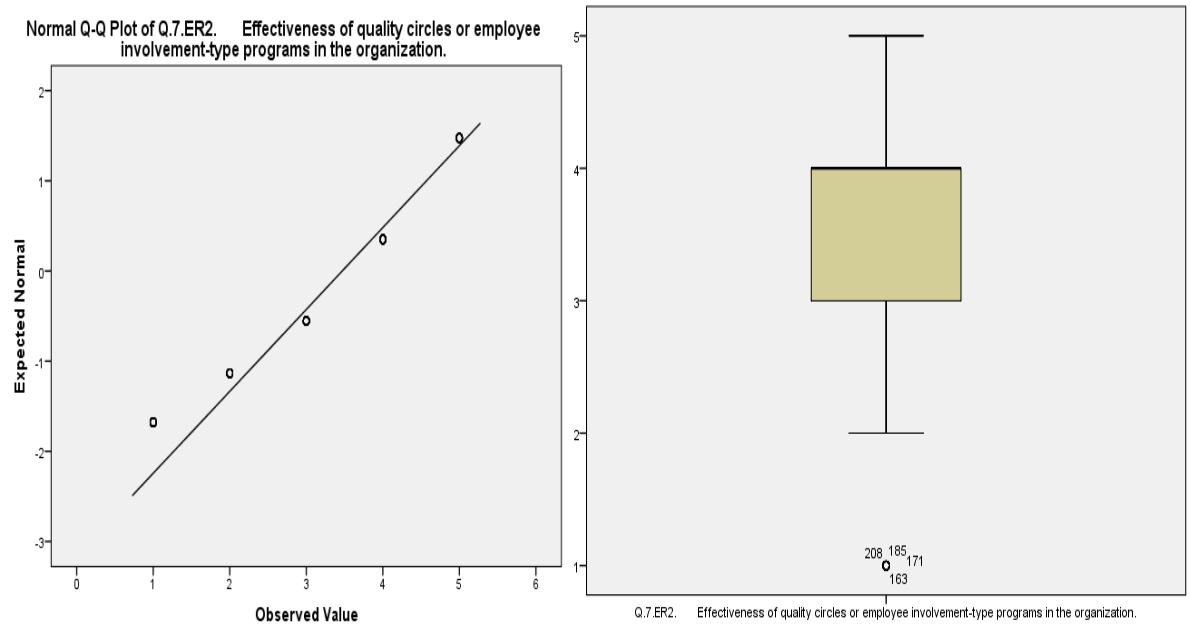

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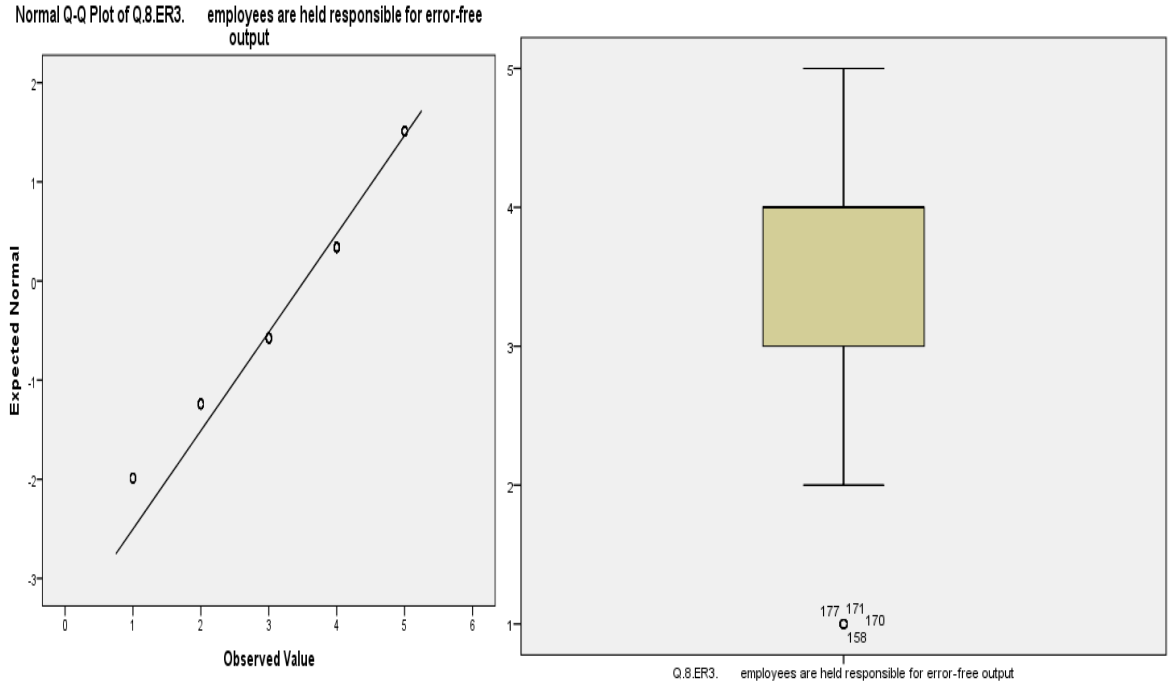

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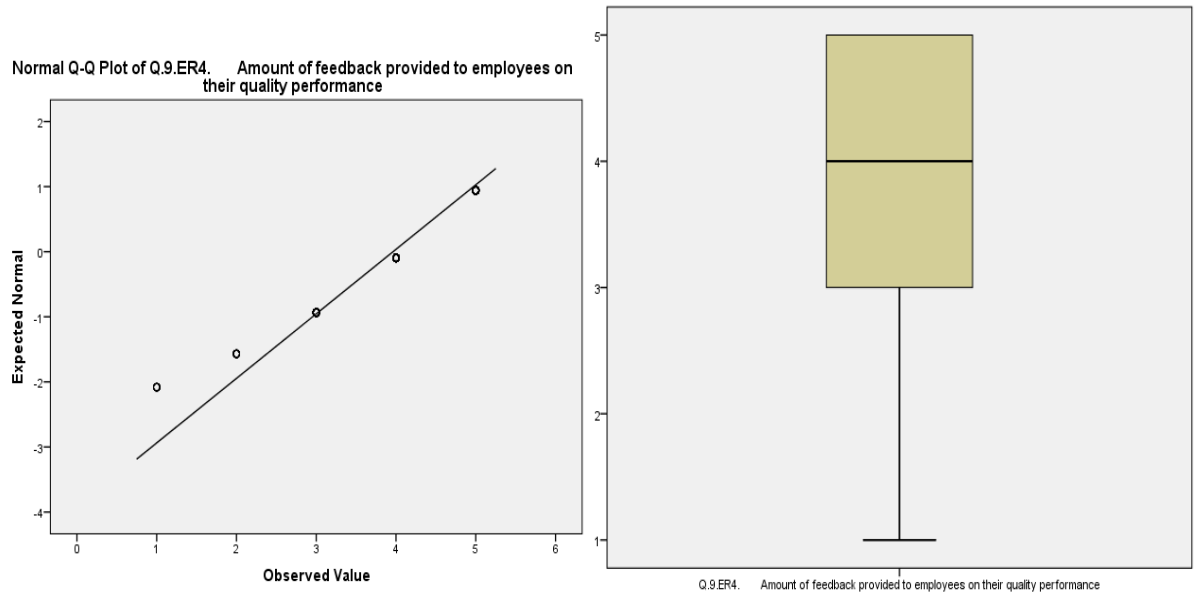

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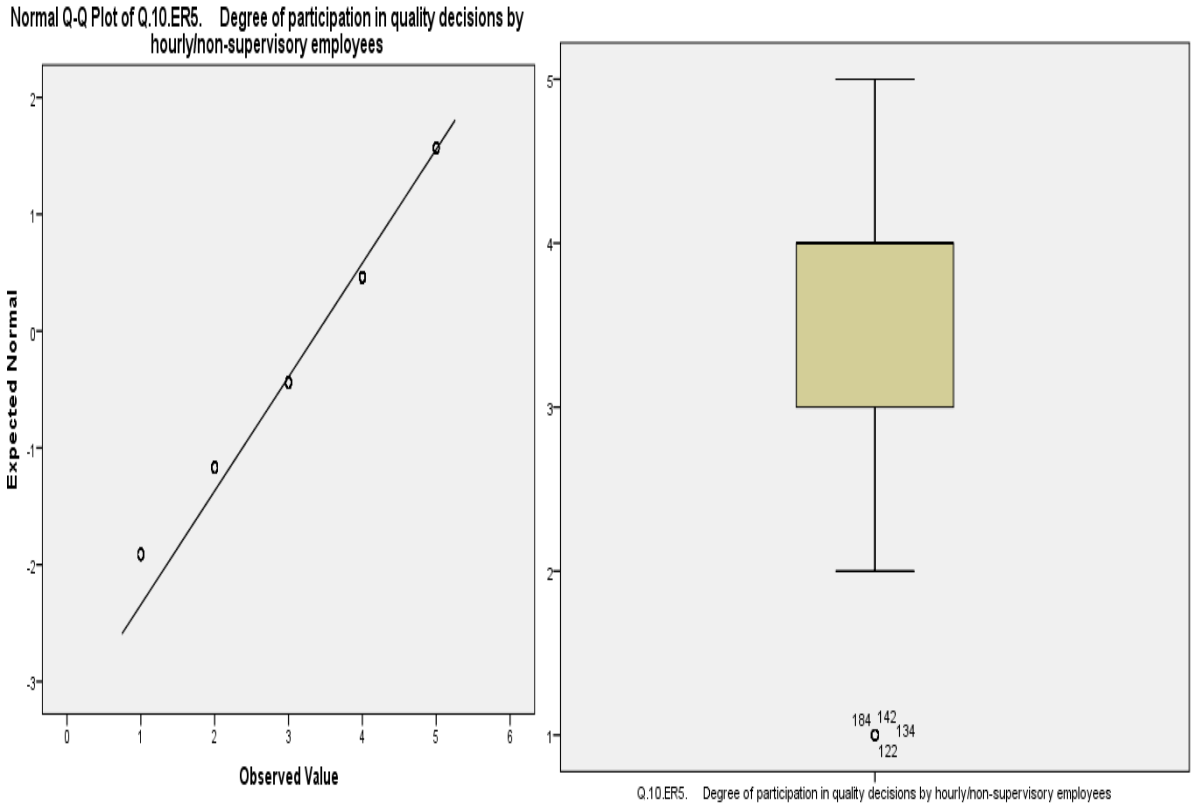

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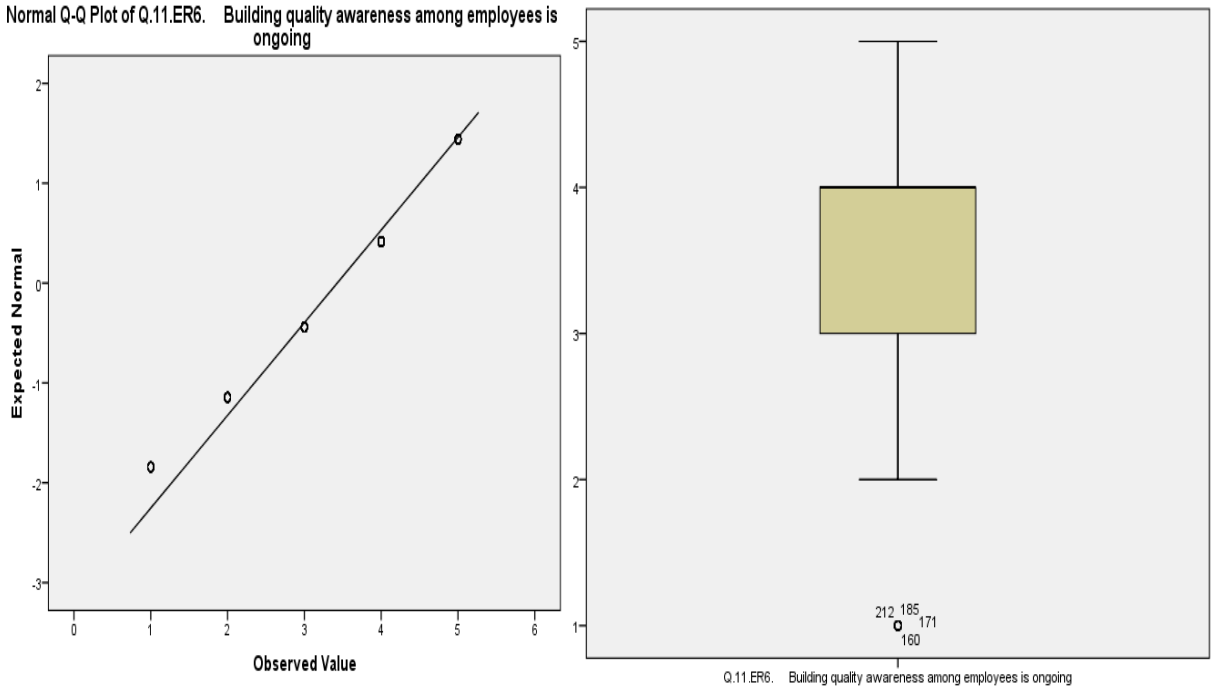

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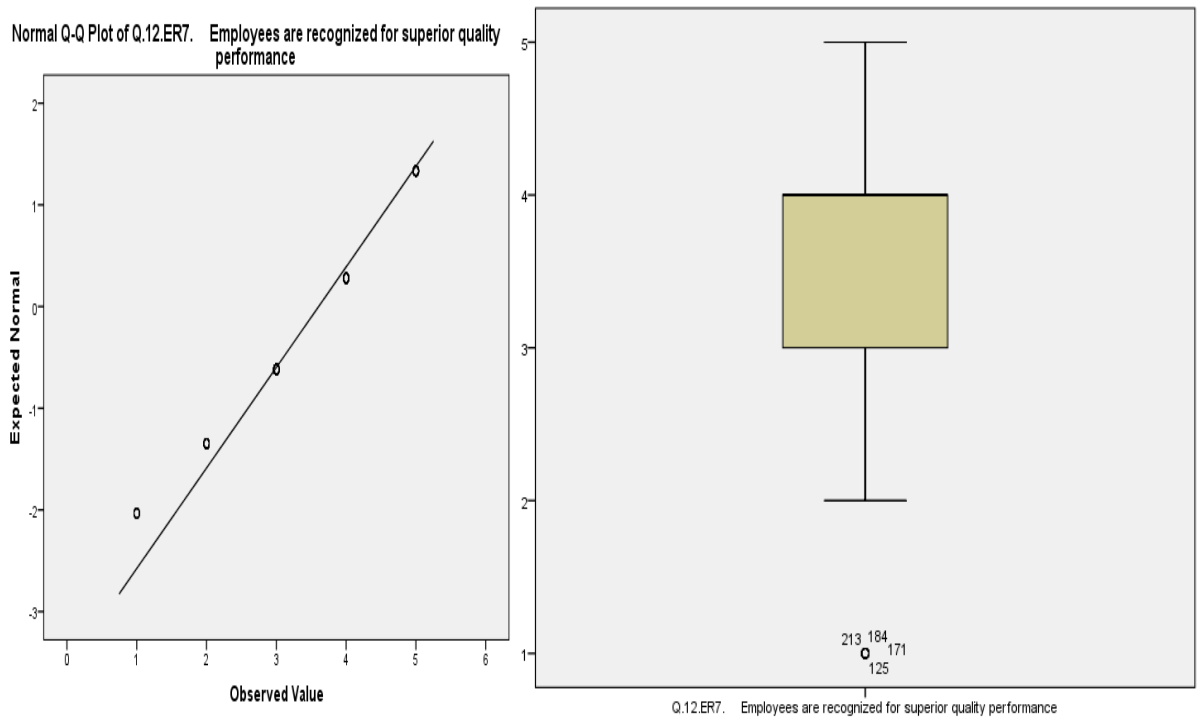

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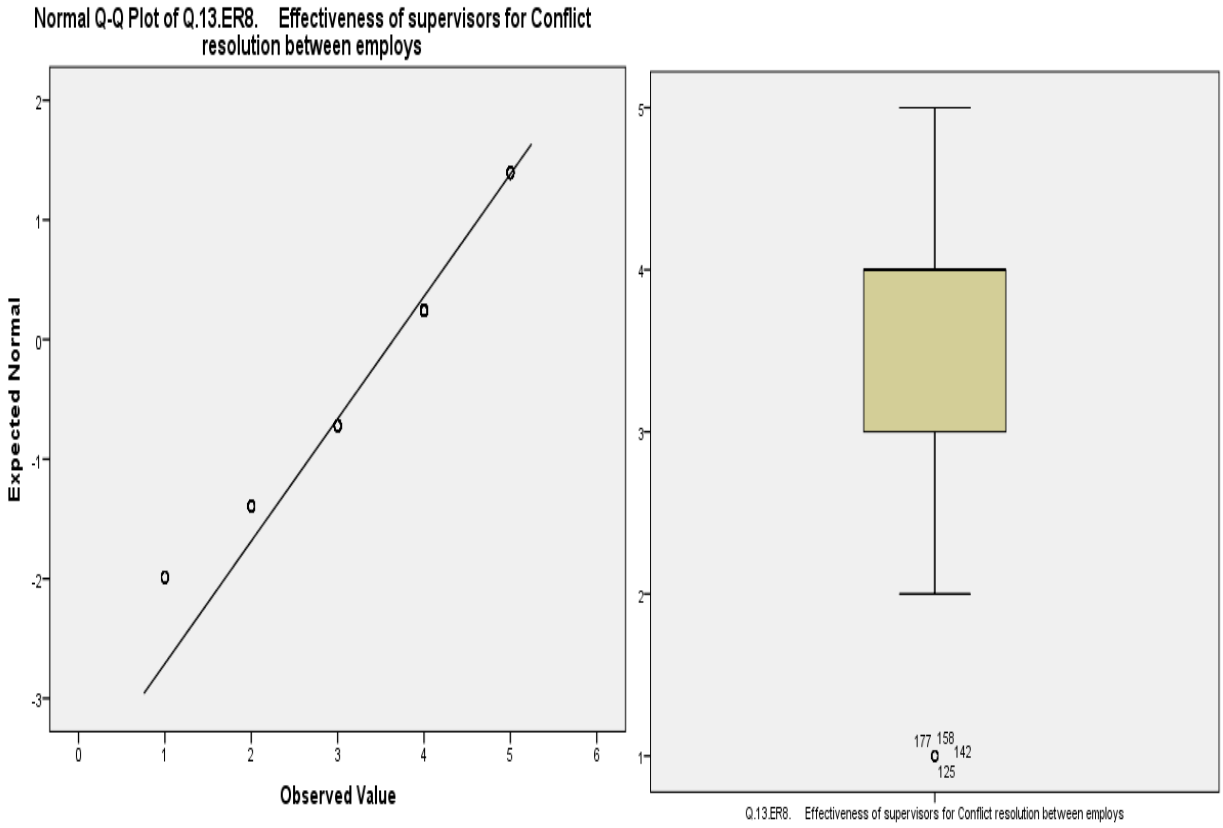
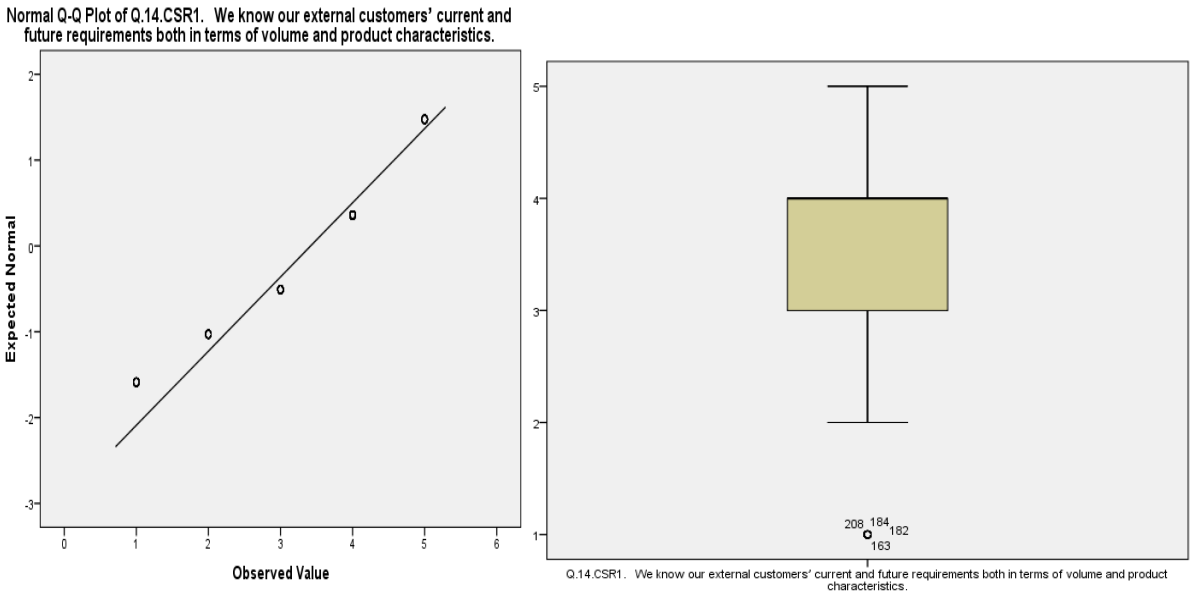
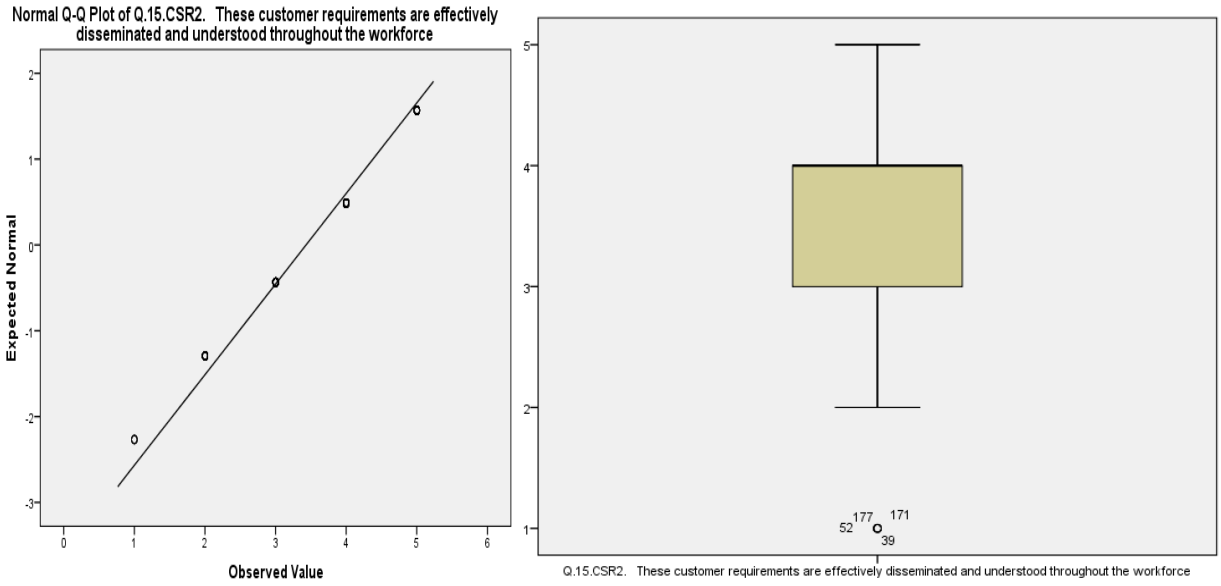


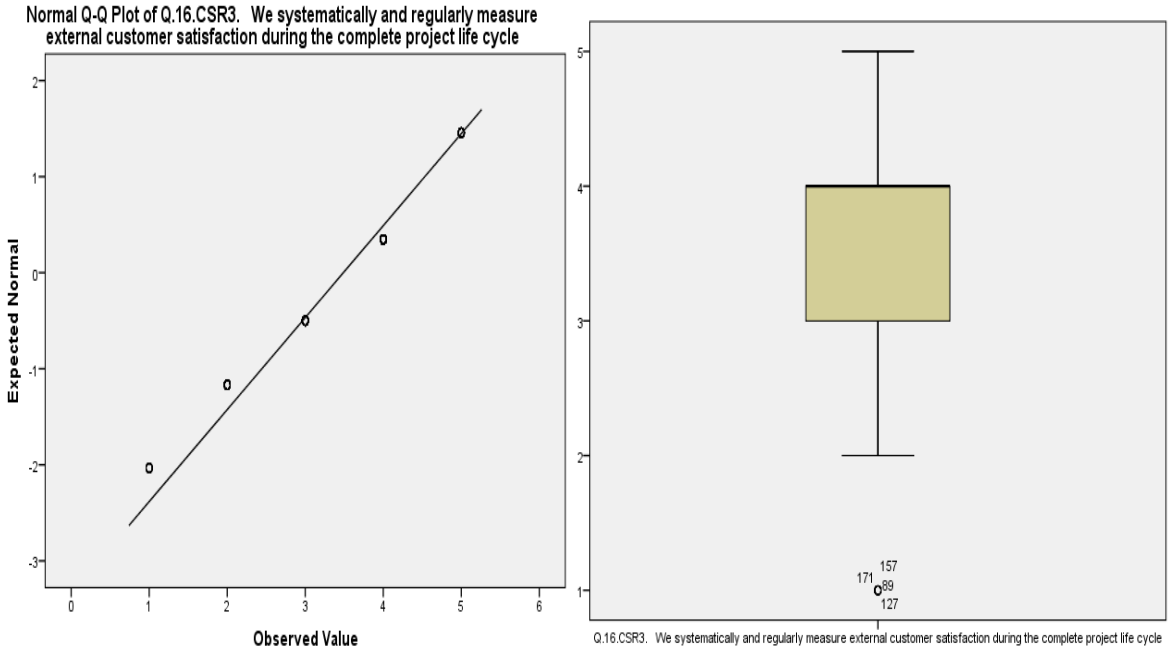
Question #14 Q-Q plot and Box plot



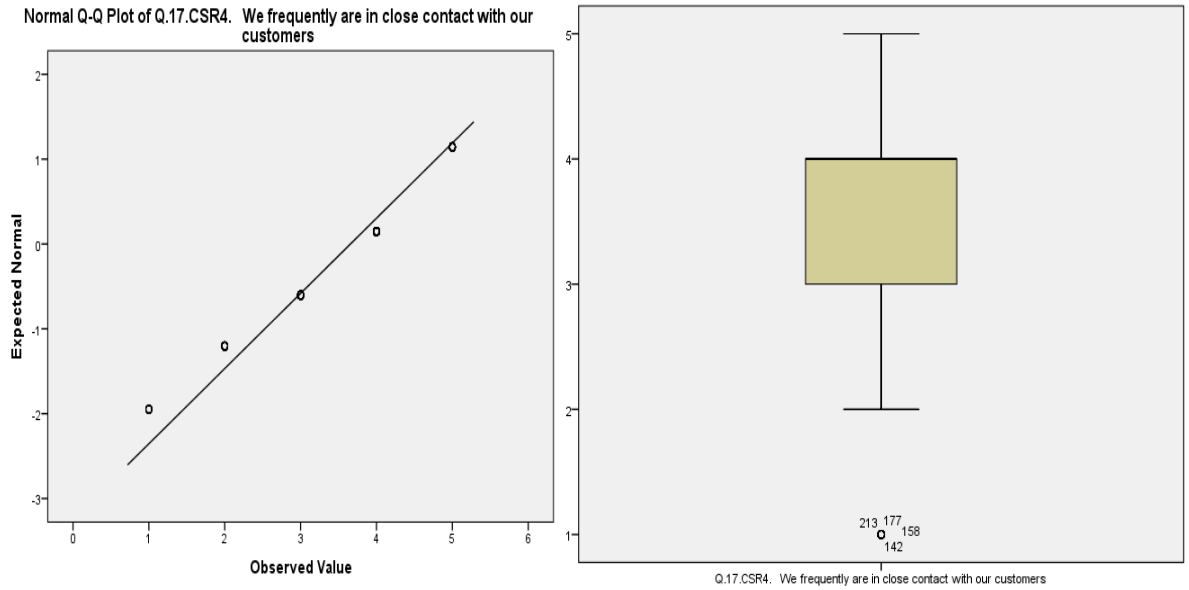
Question #15 Q-Q plot and Box plot



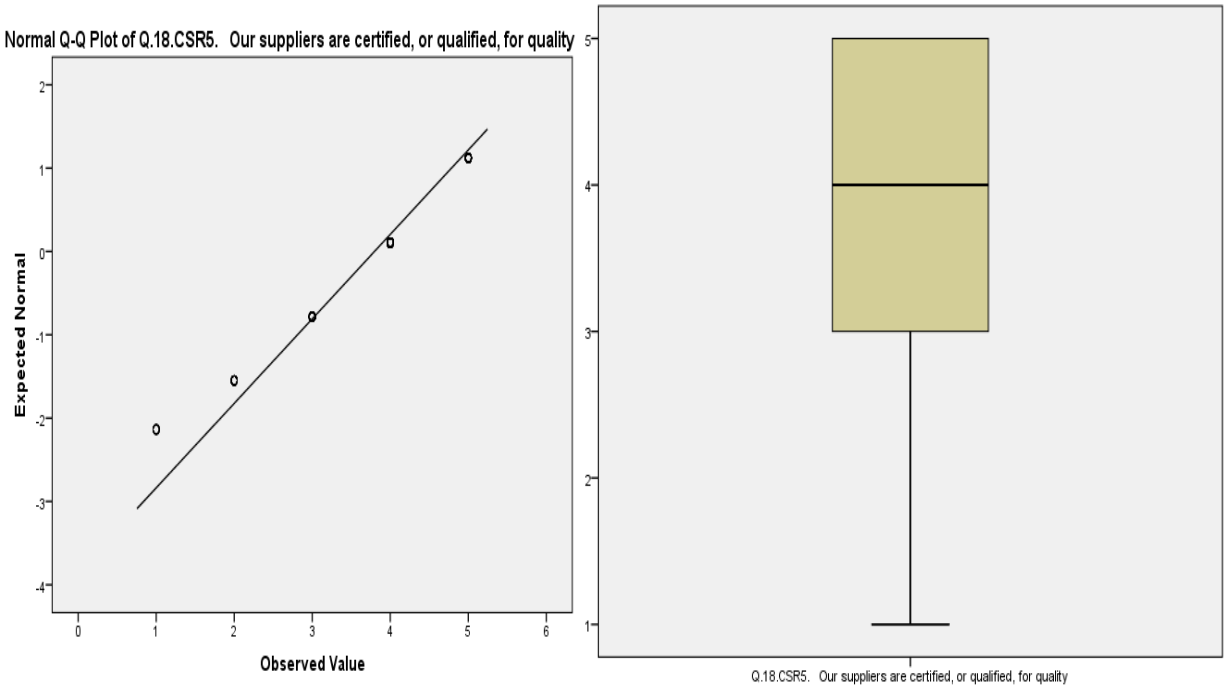
Question #16 Q-Q plot and Box plot



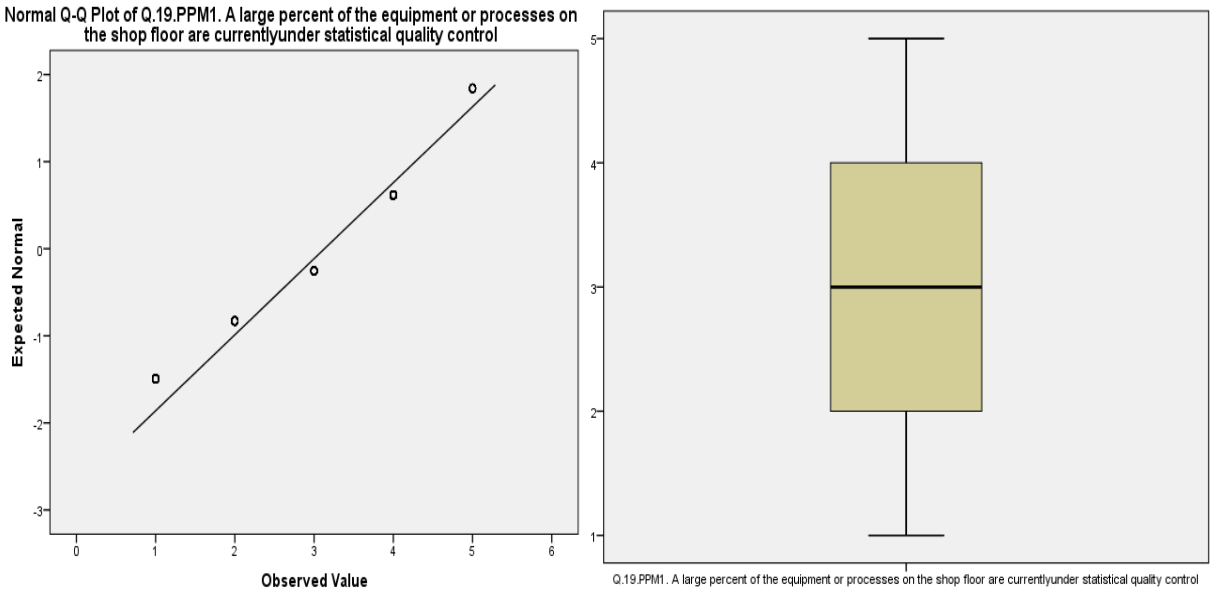
Question #17 Q-Q plot and Box plot



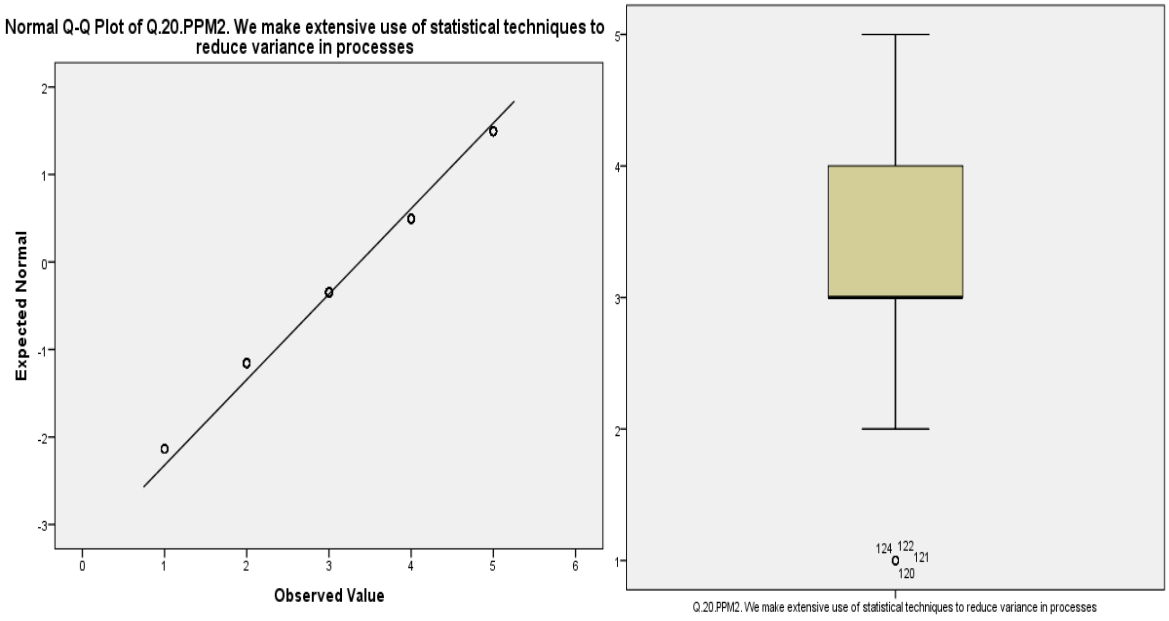
Question #18 Q-Q plot and Box plot



Question #19 Q-Q plot and Box plot



Question #20 Q-Q plot and Box plot



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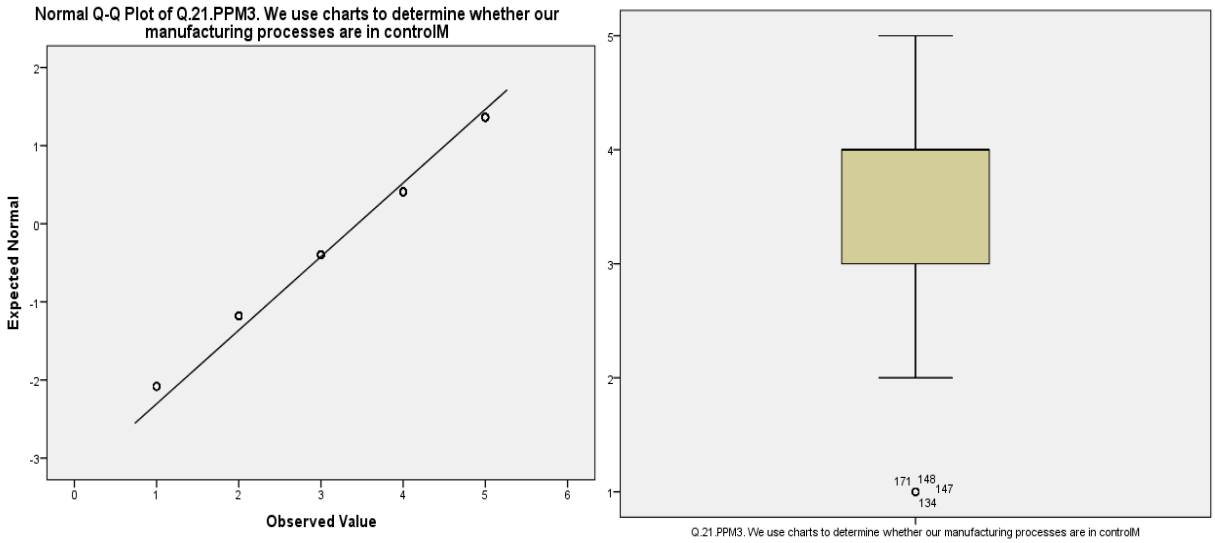
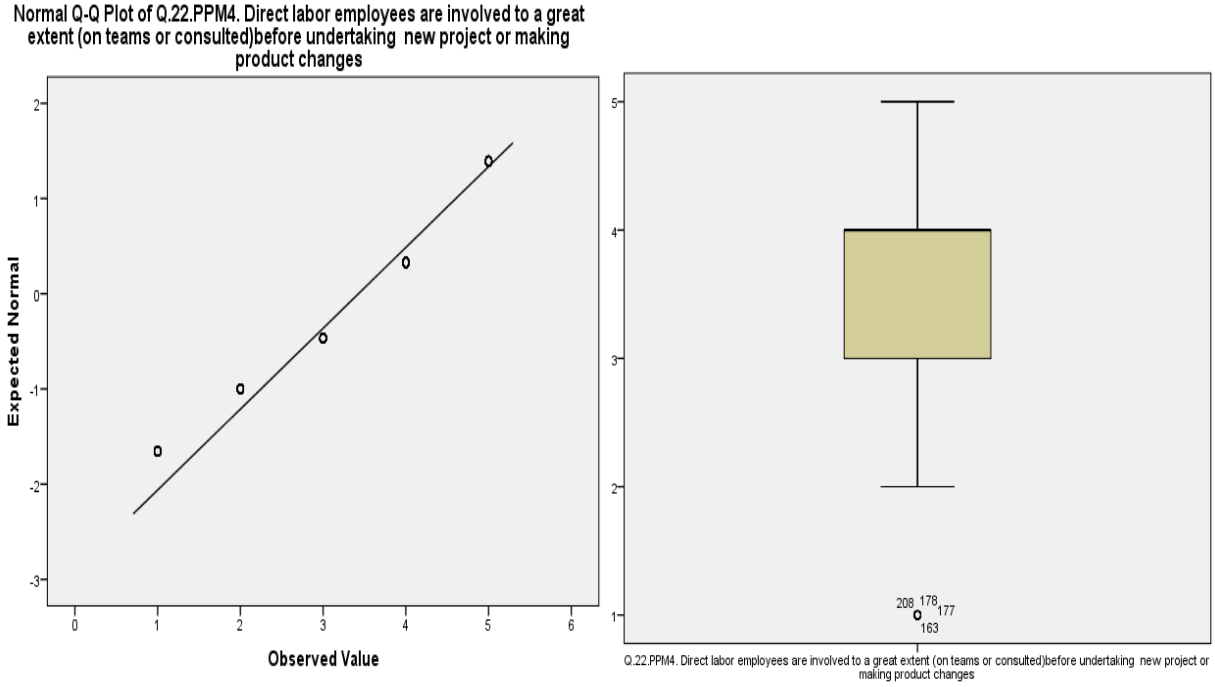
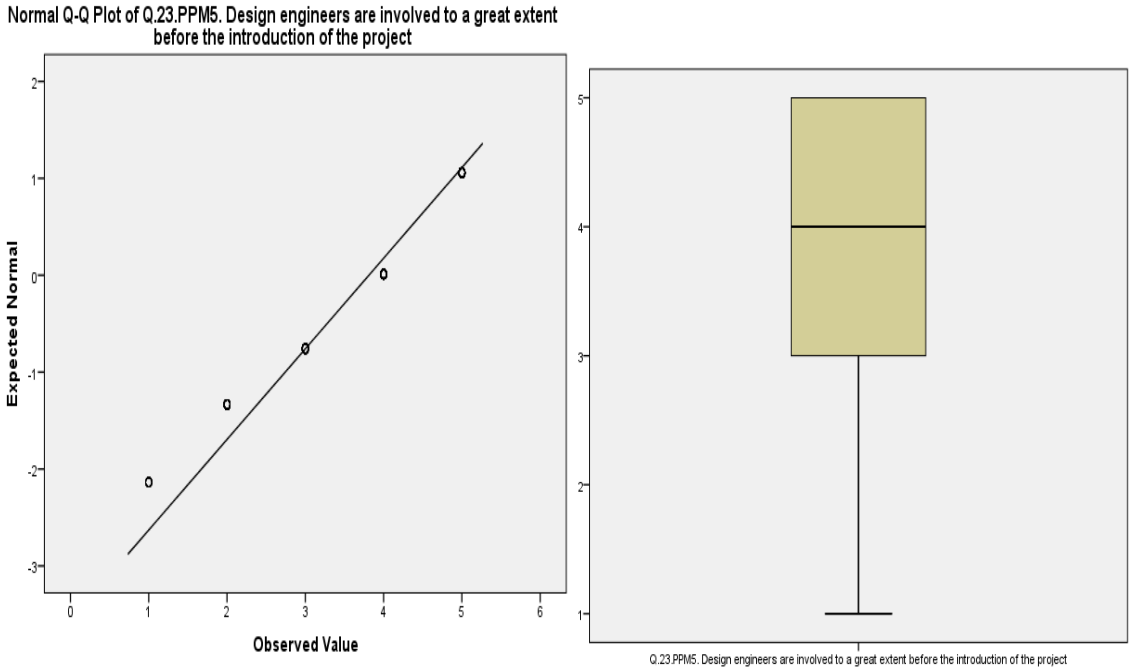


Question #22 Q-Q plot and Box plot



Question #23 Q-Q plot and Box plot



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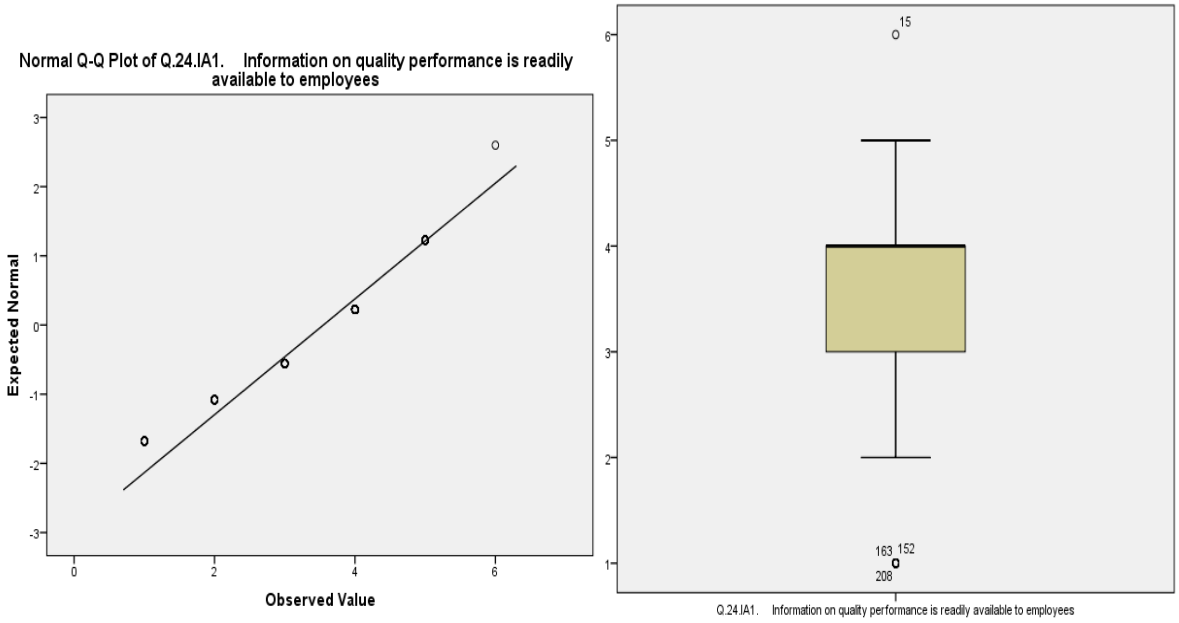

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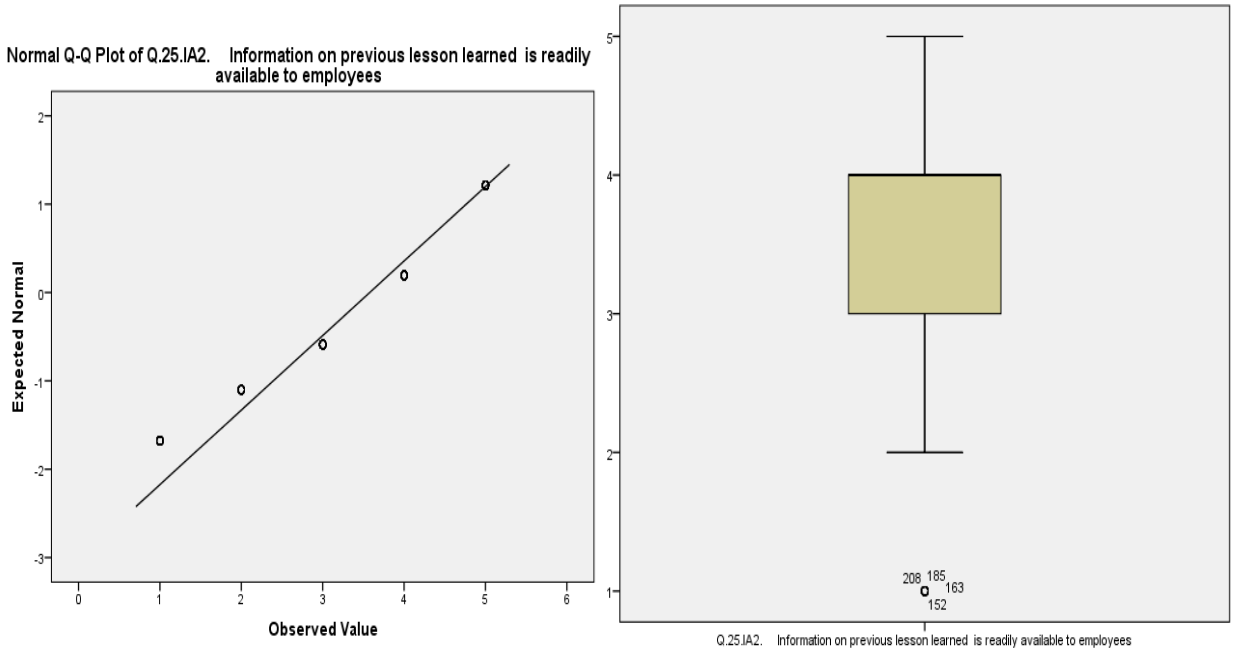

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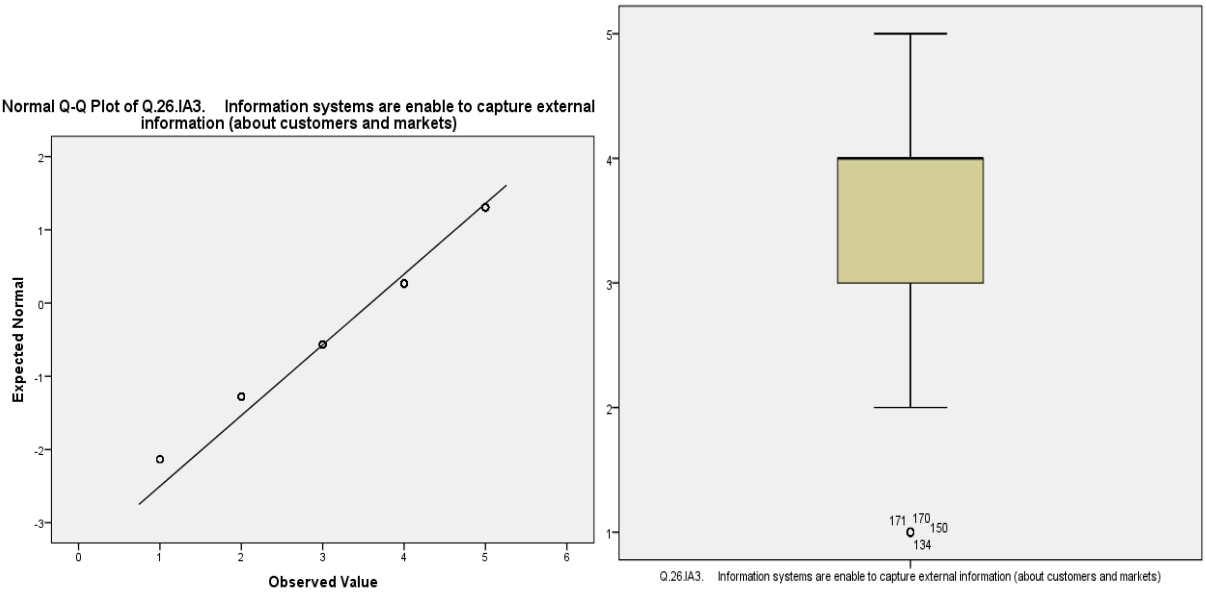

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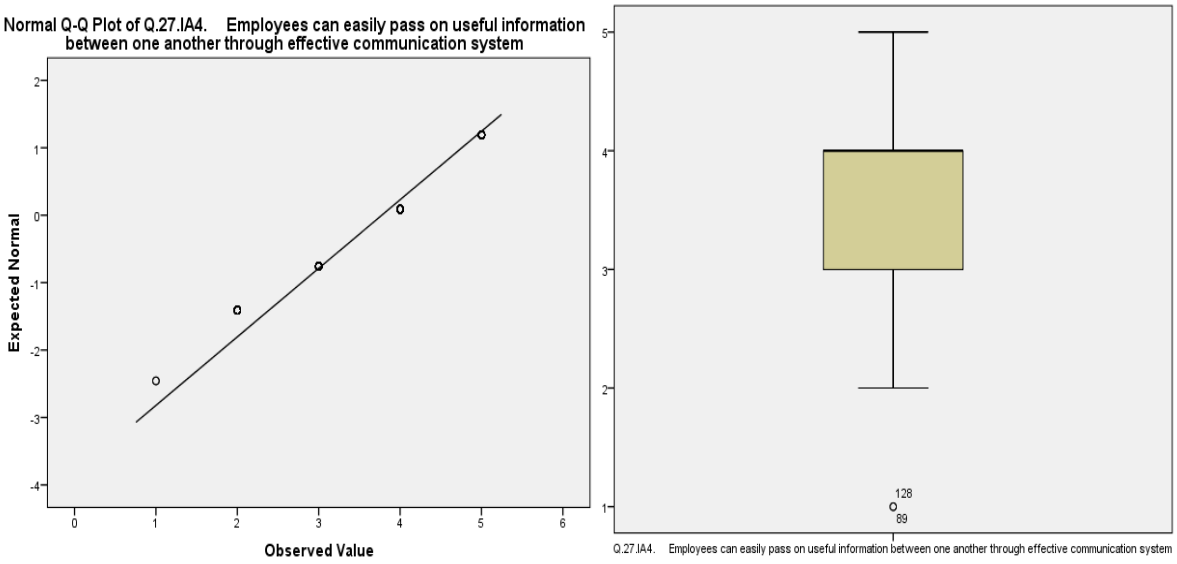

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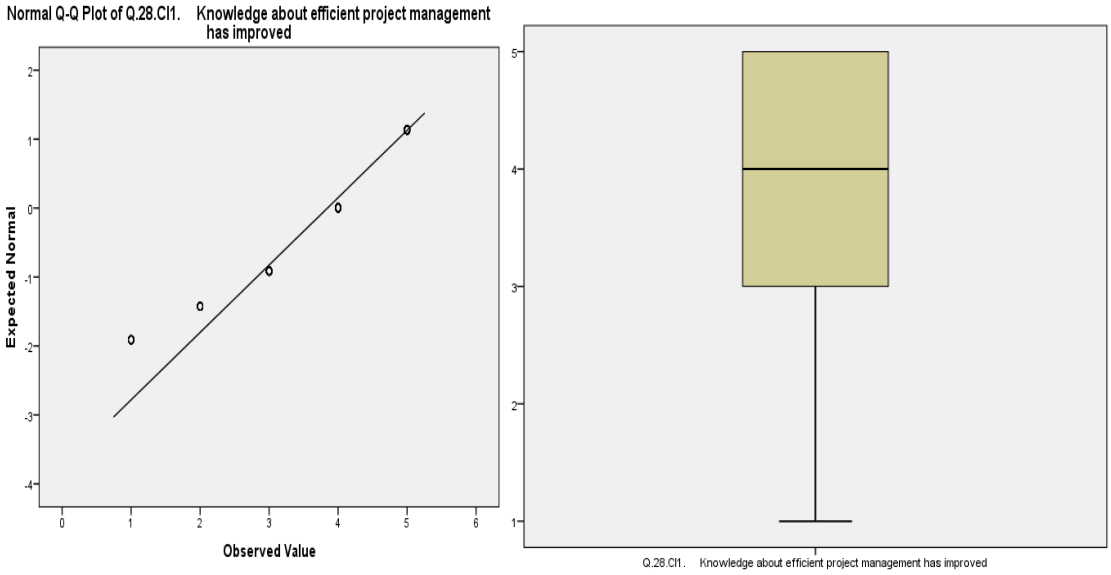
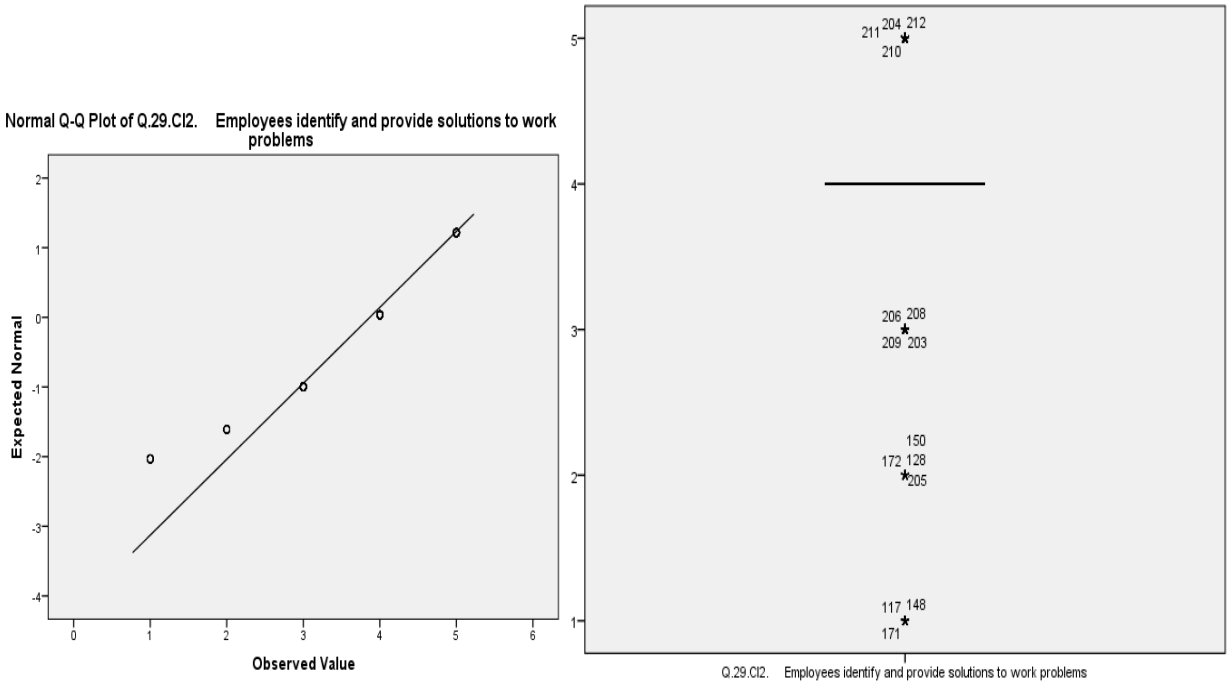
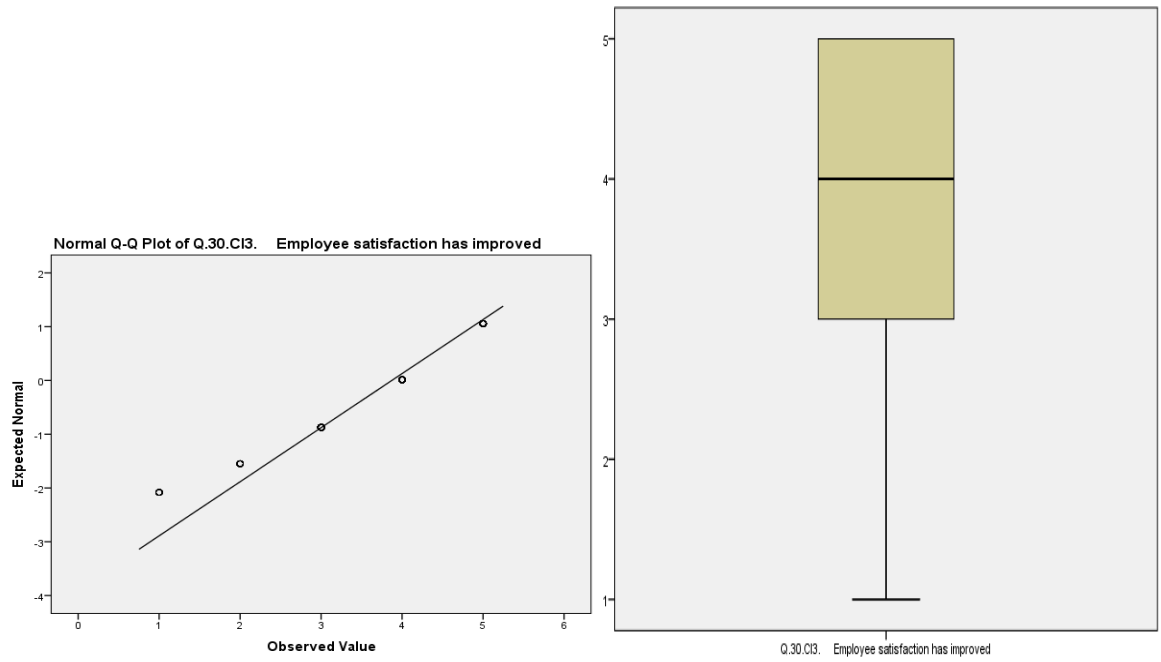


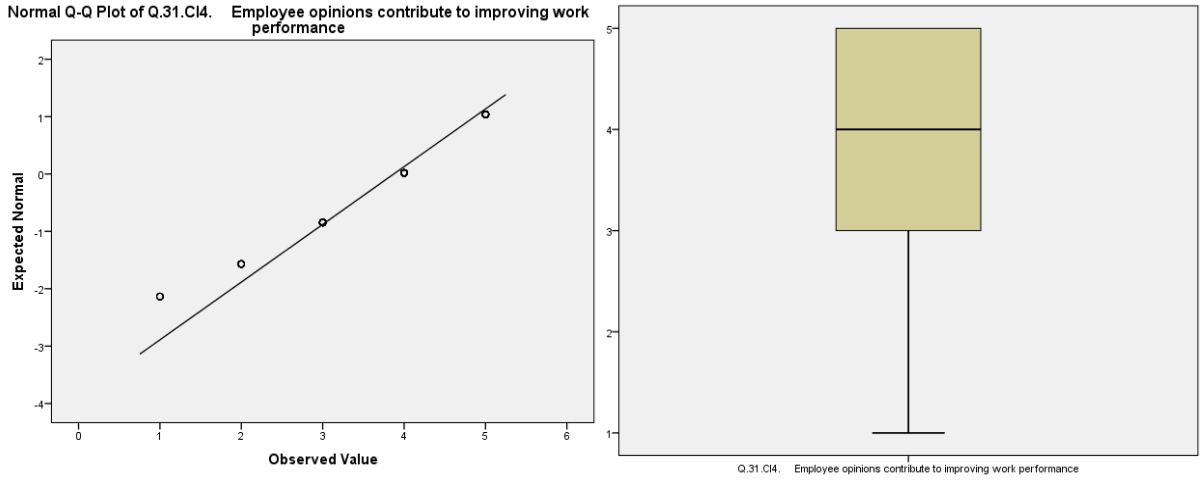
Question #29 Q-Q plot and Box plot



Question #30 Q-Q plot and Box plot



Question #31 Q-Q plot and Box plot



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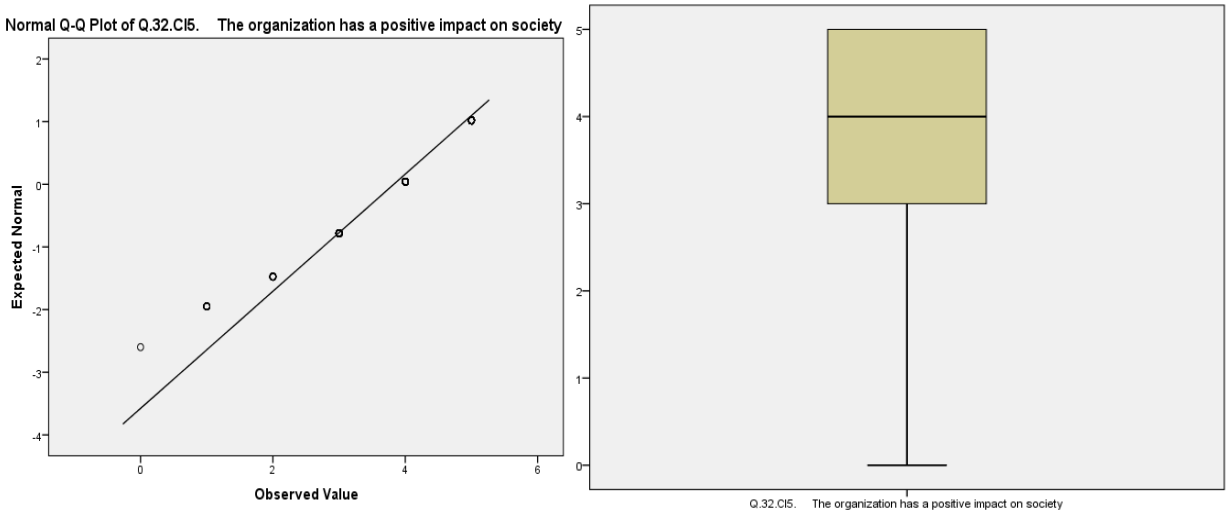

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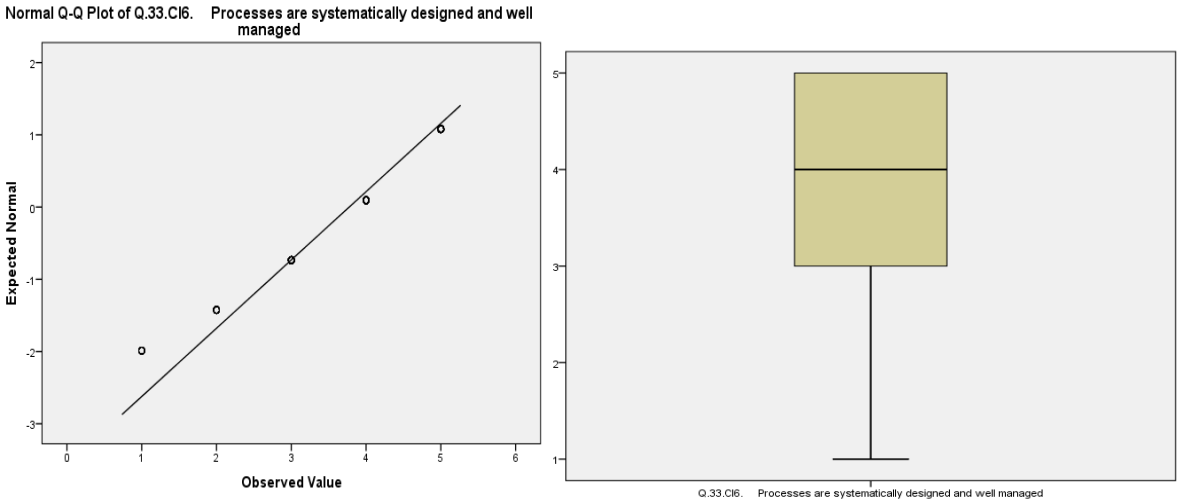

Appendix B

Dear Respondent!

I am a student of Capital University of science and technology (CUST) Islamabad and doing this survey as I am working on my thesis entitled

" Relationship between total quality management (TQM) and continuous improvement of project management in Pakistan (CIPPM)".

These questions require answers based on your experiences in your current job. Your answers will be kept strictly confidential and will be used only for research purpose. Your identity will be not disclosed on this document so kindly give an honest opinion to make this research unbiased. You are requested to take 15 minutes out of your busy schedule to fill this questionnaire. Although you are not bound to answer these questions and at any point in time, you can quit answering but still I will be privileged by your opinion in this research work. If you need findings of this research, please order a copy at engineerkamranarif@gmail.com

Once again thanks for your precious time and cooperation

Regards,

Kamran Arif

Research Scholar

Section 1

Demographics

Gender: **□Male** **□Female**

Highest Qualification: **□ Bachelors** **□Masters** **□M.Phil/MS** **□Phd.**

Designation: _____

Organization type :_____

Age:_____ **Total Experience in this**

organization(years)_____

Section 2

Leadership

Keeping in view your employer, please indicate the extent of your agreement and disagreement by entering the appropriate option.

Strongly disagree – 1 , Disagree = 2 , Not disagree/neither agreed = 3 , Agreed = 4 , Strongly agreed = 5

		1	2	3	4	5
1	Senior Managers actively encourage change and implement a culture of trust, involvement and commitment in moving towards continuous improvements.					
2	There is a high degree of unity of purpose throughout our site, and we have eliminated barriers between individuals and/or departments					
3	'Champions. of change' are effectively used for continuous improvements at site					
4	At this site we proactively pursue continuous improvement rather than reacting to crisis' 'fire-fighting'					
5	All major department accept their responsibility for maintaining quality products and quality improvement through effective leadership					

Section 3

Employee Relations

Keeping in view yourself, please indicate the extent of your agreement and disagreement by ticking the appropriate option.

Strongly disagree =1 , Disagree = 2 , Not disagree/neither agreed = 3 , Agreed = 4 , Strongly agreed = 5

		1	2	3	4	5
6	The company has made it very easy to employees at all levels to express their concerns, quality improvement ideas and reactions to quality initiatives.					
7	Effectiveness of quality circles or employee involvement-type programs in the organization.					
8	Employees are held responsible for error-free output					
9	Amount of feedback provided to employees on their quality performance					
10	Degree of participation in quality decisions by hourly/non-supervisory employees					
11	building quality awareness among employees is ongoing					
12	employees are recognized for superior quality performance					
13	Effectiveness of supervisors for Conflict resolution between employs					

Section 4

Customer / supplier relations

Keeping in view leadership, please indicate the extent of your agreement and disagreement by ticking the appropriate option.

Strongly disagree – 1 , Disagree = 2 , Not disagree/neither agreed = 3 , Agreed = 4 , Strongly agreed = 5

		1	2	3	4	5
14	We know our external customers' current and future requirements both in terms of volume and product characteristics.					
15	These customer requirements are effectively disseminated and understood throughout the workforce					
16	We systematically and regularly measure external customer satisfaction during the complete project life cycle					
17	We frequently are in close contact with our customers					
18	Our suppliers are certified, or qualified, for quality					

Section 5

Product / process design

Keeping in view yourself , please indicate the extent of your agreement and disagreement by ticking the appropriate option.

Strongly disagree – 1 , Disagree = 2 , Not disagree/neither agreed = 3 , Agreed = 4 , Strongly agreed = 5

		1	2	3	4	5
19	A large percent of the equipment or processes on the shop floor are currently under statistical quality control					
20	We make extensive use of statistical techniques to reduce variance in processes					
21	We use charts to determine whether our manufacturing processes are in control					
22	Direct labor employees are involved to a great extent (on teams or consulted)before undertaking new project or making product changes					
23	Design engineers are involved to a great extent before the introduction of new project					

Section 6

Information and analysis (Knowledge Management)

Keeping in view yourself, please indicate the extent of your agreement and disagreement by ticking the appropriate option.

Strongly disagree – 1,Disagree = 2, Not disagree/neither agreed = 3 , Agree=4 Strongly agreed = 5

		1	2	3	4	5
24	Information on quality performance is readily available to employees					
25	Information on previous lesson learned is readily available to employees					
26	Information systems are enable to capture external information (about customers and markets)					
27	Employees can easily pass on useful information between one another through effective communication system					