ATILIM UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF BUSINESS ADMINISTRATION
MASTER OF BUSINESS ADMINISTRATION

"IMPACT OF TOTAL QUALITY MANAGEMENT IN SMALL AND MEDIUM ENTERPRISES (SME) IN BANGLADESH"

Master's Thesis

MOIN UDDIN RONY

Ankara, 2019

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Supervisor

Assoc. Prof. Turan Erman ERKAN

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ACCEPTION AND APPROVAL

This is to certify that this thesis titled "Impact of Total Quality Management in Small and Medium Enterprises (SME) in Bangladesh" and prepared by Moin Uddin Rony meets with the committee's approval by a majority vote as Master's Thesis in the field of School of Business following the successful defense of the thesis conducted in May 28, 2019.

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ETHICS DECLARATION

I hereby declare that;

- I prepared this thesis in accordance with Atilım University Graduate School of Social Sciences Thesis Writing Directive,

- I prepared this thesis within the framework of academic and ethics rules,

- I presented all information, documents, evaluations and findings in accordance with scientific ethical and moral principles,

- I cited all sources to which I made reference in my thesis,

- The work of art in this thesis is original,

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Moin Uddin Rony
28/06/2019

ÖZ

Moin Uddin Rony. Bangladeş'te Küçük ve Orta Ölçekli İşletmelerde Toplam Kalite Yönetiminin (KOBİ) Etkisi, Yüksek Lisans Tezi, Ankara, 2019.

Toplam Kalite Yönetimi, çalışanları ve paydaşları daha aktif hale getirerek organizasyonun etkililiğini ve verimliliğini artıran bir sistemdir ve aynı zamanda kurumun diğer organizasyonlara göre rekabet avantajı sağlayabilmesi için insanların beceri ve yeterliliklerini uygulamaya yardımcı olur. Ayrıca Toplam Kalite Yönetimi (TKY) ile sürdürülebilir rekabet avantajı elde edilebilir. Her ne kadar şaşırtıcı bir şekilde doğru olsa da, gelişmekte olan ülkelerde yapılmış ve yayınlanmış çok küçük bir araştırma var. Araştırmanın çoğu gelişmiş ülkelerden geldi. Gelişmekte olan ülkelerde, Küçük ve Orta ölçekli endüstriler istihdam sağlamada ve ülke ekonomisini geliştirmede çok önemli bir rol oynamaktadır. Bu çalışmanın amacı, TKY'ye dayalı endüstri ile Bangladeşli KOBİ'lerin TKY'ye dayalı olmayan endüstri arasındaki farkları ortaya çıkarmaktır. Çalışma ayrıca Bangladeşli KOBİ'lerin TKY müdürünü etkili bir şekilde takip edip etmediklerini de öğrenecek. Ayrıca, bu çalışma, Toplam kalite yönetiminin yapısını ve TKY müdürlerinin Bangladeş'teki küçük ve orta ölçekli işletmelerde (KOBI) genel kullanımının yapısını bulmak için bir anket çalışması kullanacaktır.

Anahtar Sözcükler

Toplam Kalite Yönetimi, Örgütsel etkinlik, rekabet avantajı, araştırma, gelişmekte olan ülkeler, gelişmiş ülkeler, Küçük ve Orta ölçekli sanayi, farklılıklar, Bangladeşli KOBI'ler, TKY müdürleri.

ABSTRACT

Moin Uddin Rony. Impact of Total Quality Management in Small and Medium Enterprises (SME) in Bangladesh, Master Thesis, Ankara, 2019.

TQM is a system of improving organizational effectiveness & efficiency by making employees and stakeholders more active and also helps to practice peoples skills and competencies so that organization can achieve competitive advantage over other organization. Also sustainable competitive advantage can be earned through TQM. It is a very astonishing fact that most of the TQM in SME based research had been conducted and published in developed country. But very limited amount of researches have conducted in developing country. SMEs are the major source of employment and economic development of those country. This study will find out the differences between TQM based industry and Non TQM based industry of Bangladeshi SMEs. The study will also find out either Bangladeshi SMEs are following TQM principal effectively or not. Moreover, through detail analysis this study will try to find the differences between TQM and Non-TQM companies in Bangladesh and the implementation of those TQM.

Keywords

Total Quality Management, Organizational effectiveness, competitive advantage, research, developing countries, developed countries, Small and Medium industries, differences, Bangladeshi SMEs, TQM principals.

ACKNOWLEDGMENT

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Finally I want to thanks all of friends who helped me a lot to collect a huge amount of information from the survey population and also maintain the quality of those information.

CONTENTS

APPENDIX J: LIST OF ABBREVIATIONS

SME	:	Small and Medium Organization
TQM	:	Total Quality Management
ISO	:	International Organization for Standardization
HR	:	Human Resource
GDP	:	Gross Domestic product
QCCs	:	Quality Control Circles
PDCA	:	Plan, Do, Check and Act
SBA	:	Small Business Administration

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CHAPTER ONE

INTRODUCTION

1.1.Introduction:

Though TQM is a new concept for Bangladesh but due to its booming economy, many companies have successfully implemented it in their sector. Due to the impact of globalization todays companies are getting more progressive. Successful companies are always working hard to keep their customer be satisfied. Because customers are the key of success for every organization. And customer satisfaction can only be achieved through increasing customer satisfaction, reducing manufacturing cost without sacrificing quality and so on. This is already proven that if company want to be survived and grow in the future than it is so important that they should keep their customer satisfied through high quality product.

In real market, companies actually fight with each other by concertinaing in 3 issues; *Quality, Price and Delivery*. Price and quality is the heart of every product. If a company can provide high quality product in good price and ensure its delivery in timely manners than the low-cost provider wins. That is why companies are using competitive marketing strategy along with ensuring its quality also reduction of its manufacturing cost. This is the main reason of introducing of TQM in small and Medium Company. The concept of TQM is management philosophy which is three decade old and highly accepted term many companies around the globe.

TQM is a very important factor for many global companies because its help to reduce manufacturing cost ensure high quality and ensuring market share in current market. According to Ross & Ghobahdian (1994), not all companies are able to implement TQM successfully. Different implementation approach is necessary to varying the necessity of the industries in order for effective implementation. According to Yusof (1999), SMEs are slowly adopting TQM compare to large companies. But their primary focus is achieving ISO certification.

Therefore, it is very important to understand critical success factors and problems faced by SMEs should be understood. The primary focus will be reaching local TQM based SMEs and Non TQM SMEs in Bangladesh, how their practices have significant

impacts, how TQM have greater customer's satisfaction and operational performance compare to Non TQM companies.

1.2.Background of TQM in Bangladesh

From the establishment of SME, it is facing tremendous challenges on its applicability and utility. But, unlike any other larger organizations, SMEs challenges are very unique and which affect its growth and profitability and also hamper its continuous development process. Moreover, it can say that small and medium organization enjoy many benefits compare than larger organization. Also, if SMEs got proper guidance and sufficient fund, it can improve its product quality and also increase its performance.

Almost every country's private sector has limited access on finance, which is considered as the biggest barriers of SMEs. Same constrains and problems are facing with Bangladeshi company, as they are facing major financial crisis due to lack of bank support, lack of governmental fund support, higher interest rate. According to Chowdhury (2008), SMEs have a largest economical contribution in the national Economy, providing employment for average 4 industrial workers out of 5. In Bangladesh, a large number of industrial enterprises are SME size-class. There are some benefits of having large number of SMEs in a particular country. First of all, SMEs are capital and labor incentive. Not only SMEs can establish by lower investment but also SMEs can maintain through less labor cost which would be impossible for larger organization.

In Bangladesh, small and medium enterprises involvement became tumbled due to limited number of quality program and due to lack of professional people. Many industries are struggling for their operations, management and improvement their business so that they can supply their product within perfect time. Therefore, ensuring total quality became one of the most difficult challenges for those company. However, it can easily understand that the awareness and principle of implementing TQM in SME sector in developing country is still very low and not much can be done to change the situation overnight. According to Goh K. J. & Ridgeway (1984), small and medium organizations are slowly adopting total quality management techniques.

Very small number of SMEs in Bangladesh have reached in this level where they can apply quality Management methods in their technical level autonomously. Most of the company implemented it because their buyers have this kind of requirement. Especially readymade garment's sector, pharmaceutical industry and seafood industries buyers have this kind of requirement. Also they rarely undertake any step beyond buyer requirements. But it should keep in the mind that TQM standard help companies to improve awareness to earn certified standard in near future. Standard like ISO 9000 is currently very popular in Bangladesh and lots of Bangladeshi company slowly adopting it. In this thesis research, we have found that TQM companies are more progressive and competitive in following TQM principles compare to Non TQM companies. Though, the practice of TQM is a very new concept for Bangladeshi companies, this thesis try to find out those quality awareness and differences in TQM and Non TQM companies in Bangladesh.

1.3. Research Objectives

The main objectives of the research are following:

➢ How Total quality management principals have significant difference between TQM based SMEs and Non TQM based SMEs in Bangladesh.

➢ How Small and medium enterprises adopting TQM approach which have significance difference in employee involvement, recognition and reward, and education & training compare to non-TQM based SMEs in Bangladesh.

➢ How Small and medium enterprises who are adopting TQM have greater operational performance compare to non TQM based SMEs in Bangladesh.

CHAPTER TWO

LITERATURE REVIEW & THEORIES ABOUT THE TOPIC

2.1.Introduction

In this section, we have discussed the theories and contribution of different quality gurus in quality field through a proper literature review. A literature review has prepared to understand the nature of total quality management by analyzing concepts of different quality gurus. It is also true that, there are very limited literatures have been carried out in Bangladesh regarding the implementation of TQM in SMEs in Bangladesh. This literature will help to examine different types of TQM principles and how they can be adopted in SME sector in Bangladesh.

According to Raihan (2001), in Bangladesh 50.53 % of SMEs does not have proper access to finance. Unrestricted Bank credit only gets by 35.79 % small & medium enterprises. Among them 13.68 % SMEs gets restricted access. Also, less than 20 % entrepreneurs can able to get bank credits and other financial helps. Most of the entrepreneurs collect funds and capitals through personal sources like family and friends.

2.2.Existing Literature Review

Hesan A Quazi & Samuel R Padibjo (1998), have published a journal named "A journey toward total quality management through ISO 9000 certification-a study on small-and medium-sized enterprises in Singapore". In this thesis they have described that if company want to survive in the long run than it is very important to improve quality of the product and current business practice.

However, they found out several barriers on the way of implementing TQM such as the limitations of financial resources, less business capability, lack of qualified HR professionals etc. Small and medium enterprises in Singapore responsible for large share of its economy, but they have written very little regarding how TQM has been applied among companies in Singapore. The findings of this paper compared to an earlier paper in Singapore. Moreover, this report examines some discussions with some local small and medium enterprises regarding many opportunities and obstacles

of ISO 9000. So, according to the findings of this paper we can say that, only full commitment of the management is not enough for TQM but also it requires quality culture which should be created by the government.

In a case study of "The development of total quality management in Thai manufacturing SMEs: According to this case study of James Tannock, Ladawan, & Somchai (2002), many developed countries have been widely applied TQM concepts as a pioneer of the larger business brilliance. But still TQM is a new and challenging concepts. This case study said that TQM companies are rare but there are few exceptions available which can be found in some multinational company. They have brought an example where four Thai SMEs implemented TQM as SME business model for over 2 years. The struggles, difficulties, obstacles and growth of the companies have been investigated briefly. Finally, they concluded that success of those company very closely related with management and access of information.

According to Mehmet Demirbag, Ekrem Tatoglu, Mehmet Tekinkus, & Selim Zaim (2006) in their journal "An analysis of the relationship between TQM implementation and organizational performance: evidence from Turkish SMEs", they have used exploratory and confirmatory analysis and also identified seven dimensions of TQM. By using structural equation modelling techniques they analyzed the relationship between organizational performance and TQM practices.

Another report has been published in the TQM magazine by Zelealem T Temtime & Getachew H Solomon (2002), which Examines SMEs sector in Ethiopia regarding the correlation between TQM performance, perception and firm dimensions. Overall, they have examined 57 SMES through questionnaire and have collected primary data. What they found as outcomes are not different from the previous studies. They found out that, total quality management perceptions vary time to time with firm proportions and management behavior.

In the journal of Asian journal on Quality, Singh (2011) have identified and developed the operational affiliation among different aspects of TQM. In this research, they have successfully identified 11 factors for prosperous execution of TQM. They have found out that workforces training and empowerment, top management assurance, supplier coordination and development are found to be the main driving factors. On the other

hand, they have found process administration, manufactured goods design, customer satisfaction and quality are observed as dependent variables in TQM process.

2.3. Literature Review of SME in Bangladesh

According to Rahman & Mahmood (2007), SMEs are the backbone of developing countries like Bangladesh. But, the current situation is not satisfactory due to some common constraints like lack of investment capital, limited access to essential business information, weak technological infrastructure, difficult in procuring raw materials, complex bureaucratic procedures and regulations that slowing down the whole business sector.

According to Chen (2011), in developing country SMEs growth happens through various contribution and decentralized employment creation. Chowdhury (2008) said In Bangladesh SMEs play incredible role for the creation of new job opportunities, manufacturing opportunities earning of huge amount of foreign currency by increasing export.

According to Chowdhury (2008), in Bangladesh there are 6.0 million active SMEs and their contribution is average 25% in countries total GDP, also there are 31 million people are actively working in this sector and they generates 75 % total household income.

2.4. Quality Gurus: Their philosophies, Principle and Methods

Before going into the deep, we should need to discuss the contribution and works of famous quality gurus. A thesis will not be completed without the review of TQM philosopher. This review will also explain valuable insights of TQM understanding and principles. There is a common difference between the concepts of the American and the Japanese quality Gurus. According to Dale and Plunkett (1990), this difference cannot be considered as problematic: "It sometimes seems unfortunate that there are so many different interpretations of quality. But by being amenable to wide and differing interpretations it remains appropriate in widely differing situations and circumstances. Thus it has a unifying effect in that all genuine aspirations to improve quality are known to be moving in the same direction. The total quality image is the

sum of a set of attributes, each of which has its own quality criteria. The following will highlight the contributions of five quality gurus:

2.4.1. W. Edwards Deming (1986)

The most widely known quality gurus which name come at first is Deming. After Second World War Deming becomes popular among Japanese company by improving their feature in production process. He was awarded japans highest imperial in 1960. Deming had a major philosophy which was to reduce unpredictability and bring improvement through arithmetical control. According to him "statistical control could not imply the absence of defective items. It is a state of random variation in which the limits of variation are predictable". Deming thought that companies were wasting their money and time by searching quality problems without proper implementation of quality problems and he highlighted more on the use of numbers to understand the performance. Deming introduced a logical approach which called PDCA cycle which consist 4 elements like plan, do, check, and carry out action.

2.4.2. J. M. Juran (1988)

Juran was another famous quality guru who became so popular due to his fitness for use themes. By working together with Deming, they have introduced a proper bulk quality initiative for Japan. But the main difference in Juran work with Deming work was to putting more emphasizes on middle and top management. Juran said that if any problem occurs with bulk quality than management should be responsible for this. Juran also developed a theory which called trilogy which was consist of qualıty control, planning and improvement.

2.4.3. Philip B. Crosby (1979)

Crosby gained popularity by introducing Zero Defects concept. His main theme was based on defect prevention and always he had followed this statement to do the "right job right the first time". Many people had condemned him for some of his speech like "Quality is free" but they never acknowledged the second part of his speech like "Quality is free. But it is not a gift"**.** TQM beliefs of Crosby was consists of 4 criteria: First, the quality requirements of conformance, secondly, the prevention and thirdly

following the standard of Zero Defects and fourthly price. According to Crosby (1990) wrong supervision is the causes of 80% quality difficulties and that can be solved through proper management leadership.

2.4.4. Armand V. Feigenbaum (1991)

According to Feigenbaum quality is the way of dealing business and quality enhancement can only be done by everybody's contribution. There must be a good understanding between workforce and management. Workforce must have idea regarding management wants and needs. Short term motivational program which does not have any long lasting improvement must be abandon by managers. According to Feigenbaum, effective management and installation of quality program ensure best return without sacrificing quality.

2.4.5. Kaoru Ishikawa (1985)

Another famous quality philosopher was Ishikawa who was also contributor of Japanese quality improvement process. His had introduced statistical methods for the first time and also introduced Quality Control Circles (QCCs) in Japan. The QCC is consist of some small group of volunteers or could be a single person from workers or supervisors. First they examine the problems, gather information to detect or categorize the problem, and find out a solution and thereby its help them to improve quality. Meeting has been taking place regularly regarding the progress of this circle. Also they have discussed how effectively and efficiently different issues can be solved. Ishikawa becomes so popular by introducing cause and Effect Diagram, or called "Fishbone Diagram". The fishbone diagram was used to find out causes of a known effect and also documented the potential causes of problems. According to Ishikawa (1985), TQM philosophy will only work until organization implement it and use it practically in the firm.

2.5.Total Quality Management

Total Quality Management is an approach which ensures continuous improvement through long-term goals and also ensures customer satisfaction, TQM work for on

behalf of employers and employees so that they can actively participate in quality development process of their products, services and the.

To understand TQM, first we have to separate the words. Total means everything which directly or indirectly related with continuous improvement, quality means a standard which satisfy customers and management means managing all the personals so that they can achieve goals. TQM history is much enriched and the application of TQM actually came from teaching of different quality gurus such as Joseph M. Juran, W. Edwards Deming, Genichi Taguchi, Philip B. Crosby, and Armand V. Feigenbaum. TQM was first developed by Walter A. Shewhart as a statistical form. Western Electric Company first implemented this in their company which was initially managed by Joseph Juran. However, Japanese people were demonstrated TQM on a large scale through the intervention of W. Edwards Deming. Later than, Deming becomes popular as father of quality control.

According to Deming (1986), quality symbolizes "a predictable degree of uniformity and dependability at low cost and suited to the market". Deming thought that quality should be standardized according to the customer needs and to achieve highest level of performance, organization should need to bring changes on their behavior. He had pointed out 14 condition of TQM. Also he suggested redesigning the system to Plan, Do, Check and Act or (PDCA).

There are also other Definitions from other gurus include, Juran (1988) said that "fitness for use". Other researchers Taguchi & Bryne (1986) said that "'the loss imparted to society from the time the product is shipped and this related the loss to society as a whole". The main purpose of TQM is to advance the quality of goods through a systemic comprehensive and structured way. Also, continuous feedback from suppliers, consumers and involving parties are very important in TQM. Without valuable feedback no company can achieve TQM standard. The main purpose of total quality is to "Do the right things, right the first time, every time".

2.6. Small & Medium Enterprises (SMEs) around the World

Different countries have different definition for small and medium enterprises. According to Ekpeyong, D. B. E & Nyong, M. O (1992) there are no unique and universally accepted definition for SMEs in worldwide. Actually the definition of

SMEs depends on many factors such as amount of investment in the business, number of workers or personals, total production capacity, size of the operation etc.

According to the European Commission (2003), small and medium enterprises are those which has 250 employees and has less than 50 million Euros annual turnover. Also according to the union, small enterprises will be consist of maximum 50 employees and has maximum 10 million Euros yearly turnover.

By the definition of World Bank (2006) medium enterprises are those which has less than 300 employees and an annual investment maximum 15 million US dollars. On the other hand, small enterprises are those who have fewer than 50 staff members and maximum 3 million US dollars investment.

In the UK, According to Henry (2006) sections 382 and 465, those companies have up to £5.6 million annual turnover, and has maximum 50 employees are most likely can consider as small company. On the other hand, a medium-sized company has less than £22.8 million annual turnover and has employees which is maximum 250 will be known as medium enterprises.

According to USA Alen, NAICS (2012), there is a separate department set by government which is known as SBA or small Business Administration. This department is responsible for defining the nature of business either it is small or medium enterprise. They introduce some popular terms like "size standards" to define the nature of the business. Sometime SBA declares a large business as a small business so that it can enjoy large business funding.

2.7.SME in Bangladesh

In Bangladesh small and medium enterprises are playing very significant role and contributing continuously in the economy. According to government small and medium enterprises are two types –

➢ Manufacturing enterprise
➢ Non-Manufacturing enterprise

In Bangladesh SMEs are 2 types- Source: Policy Strategies for Development of SME, Ministry of Industries, Government of People's Republic of Bangladesh (2005)

- **Small enterprise:** A business entity will consider as small enterprise if it has market share, investment, machinery, investment in the plant in total round up cost less than. 15 million Bangladeshi Taka;
- **Medium enterprise:** A business entity will consider as small enterprise if it has market share, investment, machinery, investment in the plant in total round up cost maximum. 100 million Bangladeshi Taka;

According to different enterprises are defined as;

Table 1. 1 Number of Employees in different Organizations

Types of Business	No. of employees
Micro	0-9
Small	10-49
Medium	50-99
Large Above	99

Source: Policy Strategies for Development of SME, Ministry of Industries, Government of People's Republic of Bangladesh (2005)

2.8. Conceptual Framework

Figure 1.1 specifies like a bit of recipe or a blueprint of this thesis. It also provides an outline of conducting the research of my thesis. Total quality itself is a standard, it does not change much. Therefore, TQM can be considers as an Independent variables. Moreover, the SMEs or small or medium enterprises in Bangladesh were enriched with so many problems. As a developing country, SMEs of Bangladesh are fighting against these problems and also trying to adopt with the changes. Therefore, SMEs can be considered as dependent variables. Quantitative method or approach has been followed in this research. A questionnaire is being prepared which is suitable for the survey. The purpose of questionnaires was to determine the differences between TQM based SMEs and non TQM SMEs in Bangladeshi market.

The sample questionnaire has been sent to three renowned quality expert. Based on their feedback necessary changes have been brought into questionnaire. After revising all suggestion, finally questionnaire has been distributed to 110 company. The whole survey took more than one month. In this mean time, a computer software SPSS 25.0 has been prepared for analyzing the survey results. Finally, the ultimate aim of this

thesis is to distinguish between TQM based non TQM based company based on six most popular TQM principal. Based on this a model has been introduced.

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│  Literature Review  │
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│ Assemble all TQM Concepts│
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│ Design Questionnaire│
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│  Test & Debugging   │
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│ Revise Questionnaire│
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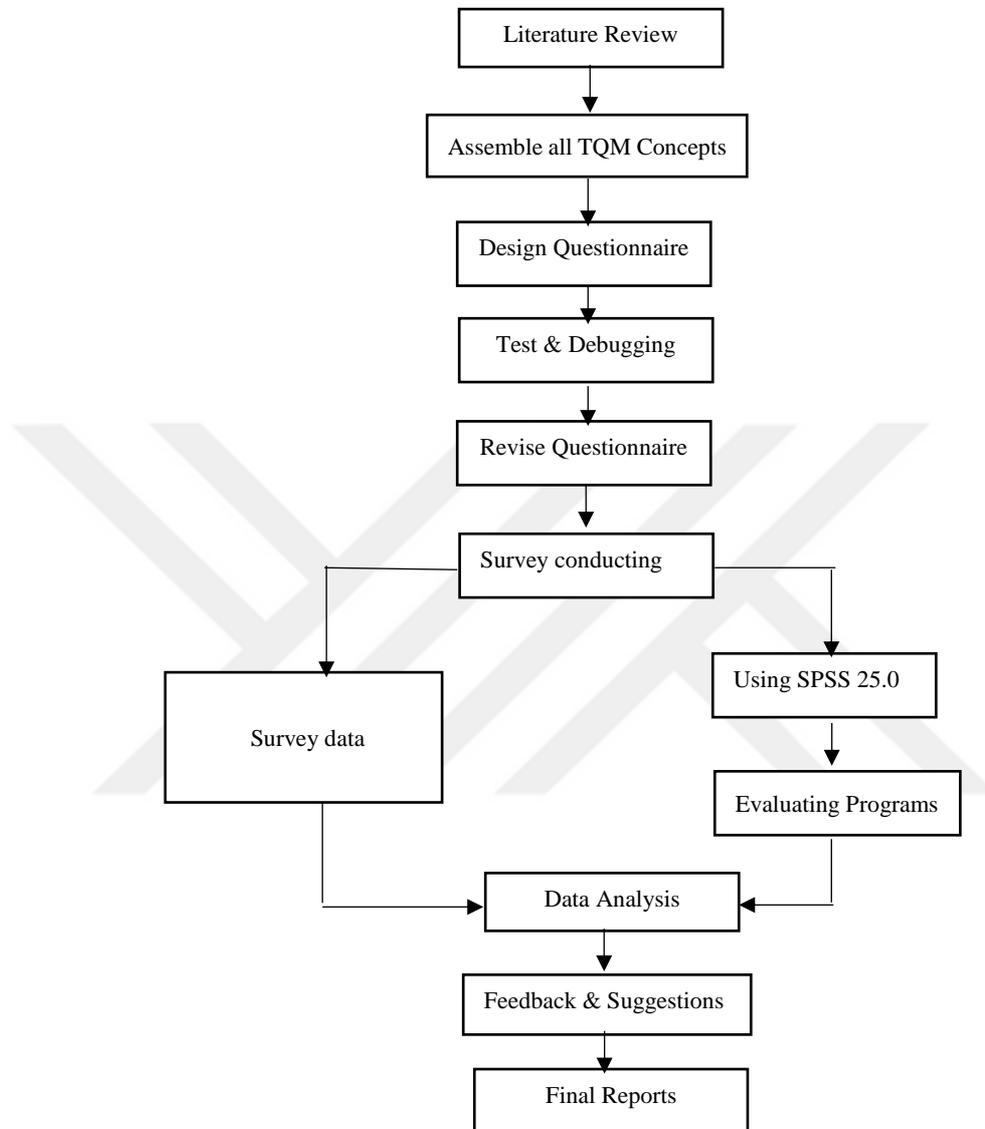
Figure 1. 1 Flow Chart of Conceptual Framework

2.9.Theoretical Framework

After briefly discussing reviews on previous literatures, a theoretical model is developed to show the correlation between Total quality principles and organizational performance. It has been shown in Fig. 2.2 This framework is also linked to the performance of the organization. The proposed critical success factors for SMEs in Bangladesh consist of six elements.

2.10. Basic Principals of TQM

They are also known as the popular and basic principles of TQM. Some principals are so crucial which can be used to increase profit as well produce product at cheaper cost along with securing greater market share. The implementation of each item will bring large amount of beneficial impact on the performance of SMEs.
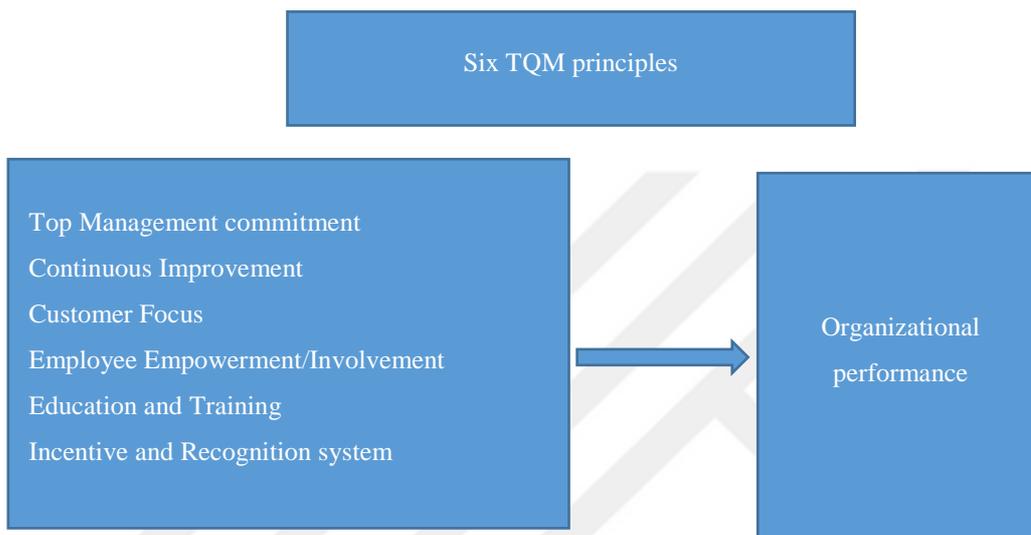
Figure 2. 1 Six TQM Principals (Source (Westcott, 2005))

2.10.1. Top Management Commitment

The implementation of TQM could vary among firms and industries but the importance of management Leadership is unanimous in all organizations when implementing TQM. Leadership commitment is considered as the major force of TQM. Without proper management quality transformation will never take place. When organization sets quality goal, it shows to all employees that what they have to achieve concerning quality. Employees get guideline from quality policies when it has been described in details. On the other hand, the task of management is to ensure and assure that quality can be defined as management commitment. Thus, performing yearly quality check assistance administration to get intuition into problems and redesigning quality plan in more efficient way.

2.10.2. Continuous Improvement

According to Wheeler & Chambers (1995), it is only when management supports, in both word and deed, the goal of continuous improvement that it will begin to see increases in both quality and productivity.
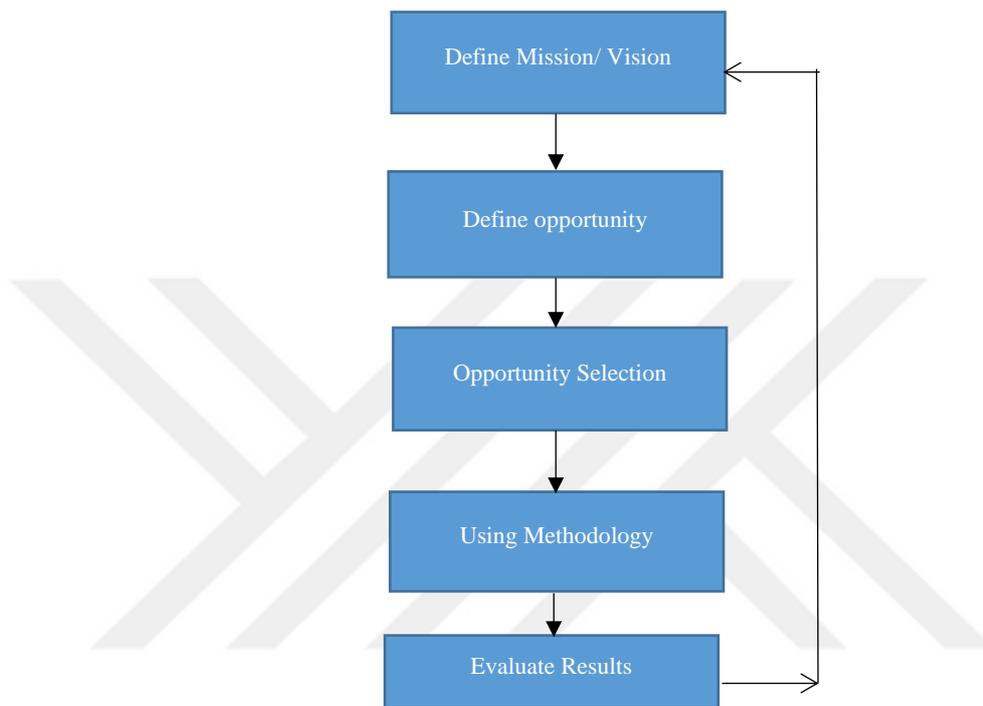
Figure 2. 2 Continuous improvement cycle

Only continuous development of the organization will not be enough it should be combination of consistency and stability. Upper management defines the goal with the cooperation of governing body and management head of the organization. Then management assign specific mission to each of everyone. This helps them to accomplish overall vision within specific time period. Along with this, priorities and focus are understood, established and determined. The next stage is to defining their vision by listening all improvement opportunities. Also, customers' needs and expectation are understood in this stage and supplier's requirements are properly judged. If any potential problems occur than necessary changes have been brought.

2.10.3. Total Customer Focus

The main of aim of TQM is to keep consumers delighted. Product with reasonable price, high quality, timely delivery and after sales service are the most important factors in total customer Focus. Also, some basic approaches of TQM are like listening customers opinions, giving feedback in timely manner, giving priority on their expectations and perceptions and also responding quickly are consider as important task. This activity also helps organization to stay close with customers, gathering valuable information on customer trend or they can benchmark their performance with different competitors. This is also consider as winning strategy for new customer also make them as a loyal customer. Total customer satisfaction also means giving careful attention to the internal customer. Its need to remember that employees are asset and its takes time to build a company with experienced employees. That's why work condition is very essential for them so that they can produce product with quality. Proper training, tools, information and empowerments are very important aspect to make employees more intellectual and experience.

2.10.4. Employee Empowerment/Involvement

Employee involvement is another basic principal of TQM. Inside an organization employee involvement can happen in many ways. For Example, top management can involve their employees in their decision making process, problem solving, understanding market more deeply, analysis demands and supply of the market and many more. Employee are the key of success of any organization. An organization cannot grow if management does not involve their employees in decision making process. That's why keeping them happy is one of the important challenge for the management. Top management can make employees happy in many different ways for example they can provide extra reward, seasonal benefits, bonus and so on. The success of organization depends on either organization is considering employees as the part of the organization or not.

2.10.5. Education and Training

Education and training is another important aspect of total quality management principal. In all organization company train their employees from time to time by

various seminars, classes, fair, educational institution and so on. Without proper education and training no employees can fully utilize in any situations. This process can be considered as a long term investment. Because, employees are asset for any company. They believe that essential education and training of workforce plays very important role in terms of motivate and earning the satisfaction of top management. In total quality management process, it's very important to train employees of the organization so that it will improve their additional capabilities. Training in TQM is a never ending process. Personal and team efforts should continuously introduce. This training should be given to this people who think they can use it for continuous improvement process.

2.10.6. Incentive and Recognition system

When someone gives their best effort they should deserve rewards which is given in exchange of their hard work. Incentive and Recognitions are two different but closely related motivational factors. Incentives is a known reward and employees knows when they will get it. On the other hand, Recognition is a subjective behavior which remain unknown in the most of the time. In many cases incentives are given as seasonal bonus but Recognition does not have any specific time period, employees does not have any idea when top management will give them recognition and the reason is also unknown. Rewards come in various from such as recognition, praise, coaching, concerns all are vitals forms of reward. Reward and recognition is considered as one of the most important motivational factor. When recognition will successfully implement employees will highly encourage to improve quality.

2.11. Hypothesis

To fulfill the objectives of the research we have constructed following hypothesis.

Research Hypothesis 1

- NULL HYPOTHESIS (Ho): TQM principals do not have any significant differences between TQM based SMEs compare to enterprises which do not follow TQM.
- ALTERNATIVE HYPOTHESIS (H1): TQM principals have significant differences between TQM based SMEs compare to enterprises which do not follow TQM.

Research Hypothesis 2

- NULL HYPOTHESIS (Ho): SMEs adopting TQM approach have no significant differences based on employee participation, recognition and reward, and education and training compare to non-TQM based SMEs.
- ALTERNATIVE HYPOTHESIS (H1) SMEs adopting TQM approach have significance in employee participation, recognition and reward, and education and training compare to TQM based non-TQM based SMEs.

Research Hypothesis 3

- NULL HYPOTHESIS (Ho): SMEs adopting TQM approach have no significant differences in operational performance than non-TQM based SMEs.
- ALTERNATIVE HYPOTHESIS (H1): SMEs adopting TQM approach have significance differences in operational performance than non-TQM based SMEs.

CHAPTER THREE

METHODOLOGY & SURVEY

3.1.Introduction

Methodology is a combination of methods, techniques and procedures of investing a research in a proper way. Methodology can be two types quantitative and qualitative. If information's are brought by words, it is called qualitative but if information's are analysis by figures, facts or numbers than it is consider as quantitative research method. Also in quantitative method information's are analyzed through statistical methods. But in qualitative methods words are analyzed through descriptive interpretation. So the main difference between two methods is that qualitative research methods analyzed texts and try to reach in a decision by using logical interpretation while quantitative methods analyzed and transform information's into numbers, fact and figures.

Therefore, we have followed quantitative method in this research. It was the main objectives of the thesis to find out the differences between TQM and non TQM in Bangladesh SME sector. We have collected huge amount of data by using questionnaires just like any other researcher. Also we have find out the problems they were facing as well as the factor that helped them to be successful in implementing of TQM system.

This part is also most important part of this thesis. All the respondent companies who participated in this survey from Small and medium Enterprises (SMEs) in Bangladesh are listed here. It also consists of the response rate, types of industry, percentage of responses and the status of quality certification. This survey also tries to find out the level of quality implementation in Bangladeshi SMEs. We have divided and analysis 6 major principles of quality so that we can find out each differences based on each major principals. After discussing major principles of TQM and its level of adoption, we have discussed three hypotheses, tested it and come up with the difference between TQM based SMEs and non TQM based SMEs.

3.2.Research Design

In this research we have used deductive approach. First, we have developed the theory than we narrow it down to hypothesis so that we can test it. Than we narrow it evens more so that we can collect observation to address the hypothesis.

3.3.Method of data Collection

Data collection is a way of collecting information. There are two main way to collecting data, those are secondary data and primary data collection.

3.3.1. Secondary data

We have collected secondary data through various academic journals, articles and textbooks. Also we have used number of online resources and renowned websites. Those are given in reference section.

3.3.2. Primary Data

For this research, we have collected primary data by questionnaire. The primary purpose of data collection was to find out the differences based on six basic TQM principals.

3.4.Design of Questionnaire

In order to assist the data collection properly different survey method was used. At the end we have developed a questionnaire. We have taken lots of preparation regarding survey. First, the questions of this survey have designed such a way that examine the differences of TQM and non TQM in Bangladesh SMEs. The survey has been conducted by the help of friends and family members. We have followed face to face interview and online communication because the targeted population were situated in different demographic area. The format of the questionnaire was very simple. We have emphasize on 4 important aspects of the questionnaire, those are simple language, popular concepts, degree of practice and 5 point Likert scale which is the most popular from of collecting information in a more efficient way. A five-point Likert scale was introduced with the scoring option from 1 to 5 where 1 = strongly disagree and 5 =

strongly agree. Moreover, a zero option also kept so that the companies can express neutral choice or may be this is not applicable for them. In this questionnaire, whole part divided into three section. Section 1 used for identifying the general information of respondent companies. Information's like number of employees, types of industry, quality system certification and number of year of their operation will be taken in consideration.

The section 2 is consisted of six basic TQM principals of the organization. At the end of the survey, a total of 36 company's statement has been collected. In each statement, a respondent were given their opinion either they are strongly disagree to strongly agree or not. And also it has another rating question which used to identify the level of practice from very low to very high practiced.

Finally, section 3 finds out regarding operational performance of those organization over last one to two years after implementing TQM. Also respondent were asked to given their opinion as significantly decreased to significantly increase. Different types of measurements such as Absenteeism rate, Suggestions from employees, teamwork information's have been collected.

3.5. Testing and debugging of questionnaire

After preparing the sample of the questionnaire it has send to three renowned quality experts from Bangladesh. They are Engr. Mofiud Doula, Engr. A. M. M. Khairul Bashar P and Engr, Engr. Mokarram Uddin Ahmed. They are the members of Bangladesh Society for Total Quality Management (BSTQM) which is a voluntary organization engaged in promoting Total Quality Management (TQM) in Bangladesh. The society was established on 04 May 1996. According to one of the expert, the TQM survey should be limited on the denim industry to avoid unnecessary sample size. Based on their recommendations, major changes have been brought in the questionnaire. As well as numerous changes were made. Finally, a total of 4 pages questionnaire with total questions have been prepared for the survey.

3.6. Survey Administration

We have distributed our questionnaire to more than 110 TQM and non TQM companies in Bangladesh. Most of the companies are enlisted with BSTQM database. Based on the expected response rate, the sample size has been decided. From total 110 companies, 32 companies returned the questionnaire and denied to share any kind of information with us, 12 set of questionnaire is completely returned back. Varity of date collection techniques have been used like follow up letters, personalize meeting through friends and employees. Finally, survey data's were examined carefully by using SPSS version 25.0.

3.7. General Profiles of Respondent

The survey had spread to 110 SMES (Small and Medium industry) all over Bangladesh. But the rejection rate was viable. Thus, at the end we only get 36 useable responses from our respondent and those were being used for analysis. It was the primary criteria that the questionnaire should be completed by the responsible person.

Table 3. 1 Breakdown of the respondents regarding to their size of industry

Size of Industry	Size of Industry	Percentage (%)
Small Industry (<49 Employees)	17	47
Medium Industry (50-99 Employees)	19	53
Total	36	100

Table 3. 2 Types of Industry

Based on TQM	No. of Companies
TQM Based	18
Non TQM Based	18
Total	36

Normally they are the people who are currently working as managing directors, quality managers or assistant quality manager since they directly remain keep in touch with quality process. We have used SPSS version 25.0 for analyzing the result. At the first stage we have examined the general profile of respondent, after that we have the size of the company and then type of the industry.
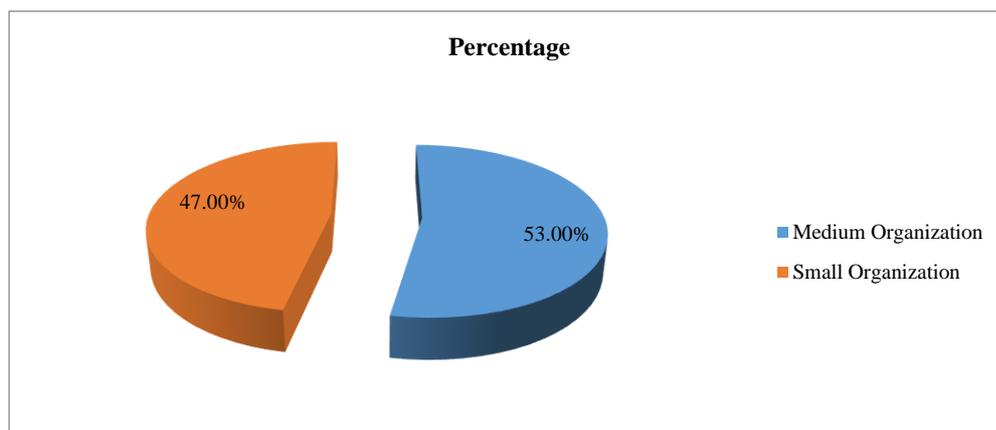
Figure 3. 1 Percentage of Small versus medium companies

If we Breakdown the following table we can see the size of the industry, no of respondent and their percent has shown in this table. Among the different group 53% organization was categorized as medium industry where they have 50 to 99 employees, 47% organization were small sized enterprises that have less than 49 employees. Among 36 companies 18 companies are from TQM and other 18 are from Non TQM based industry.

Table 3. 3 Breakdown of different types of Industry who participated in the Survey

Unit Name		Frequency	Percentage % of SMEs
Valid	Agricultural Food	1	2.6
	Readymade Garments	5	12.8
	Chemicals	3	7.7
	Electronics	7	20.5
	Fabrics	2	5.1
	Foil Industry	1	2.6
	Food & Beverage	1	2.6
	Knitting	1	2.6
	Motor Parts	1	2.6
	Paint	2	5.1
	Petroleum	1	2.6
	Pharmaceutical	3	12.8
	Plastics	1	2.6
	Apparels	1	2.6
	Shoes	1	2.6
	Technological	3	7.7
	Textiles	2	5.1
	Total	36	100.0

Table 3.3 shows the types of the industry who participated in the survey. As you can see, the highest participant's companies are from electric industry, which is 20.5 %. Second largest participants were readymade garments and pharmaceuticals industry, number of both of them were equal to 12.8% percent respectively. İn total 36 companies have been participated in this survey.

3.8.Comparison of Six TQM Principles mean among TQM and Non TQM based company
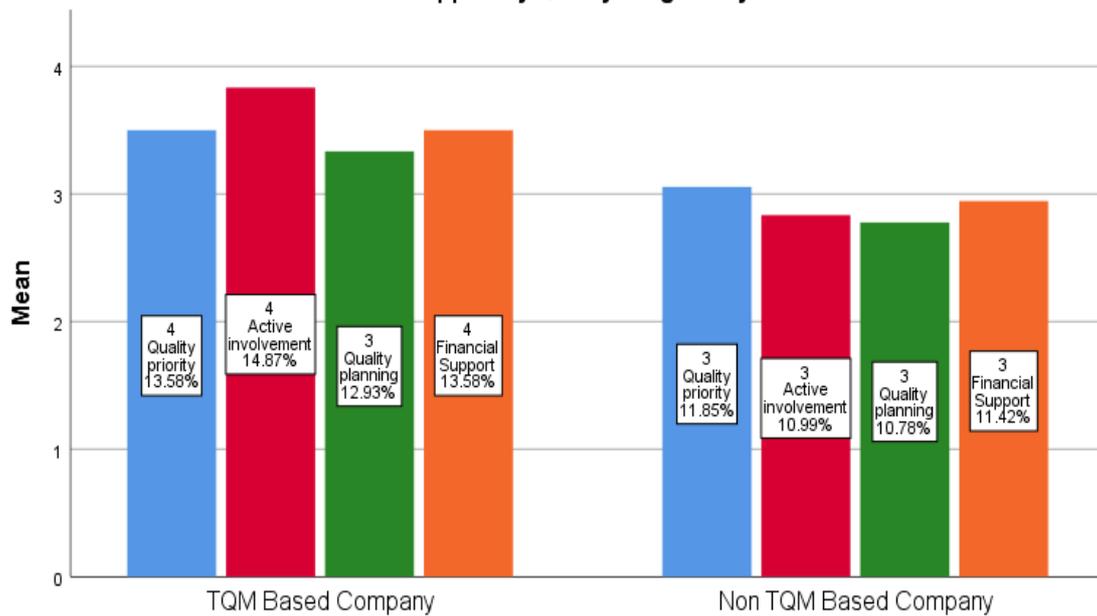
Figure 3. 2 Top Management Commitment

1. Top Management Commitment

This chart shows the mean of Top managements quality priority, active involvement how they set quality program, financial support for quality program. As we can see TQM Based Company's top management are highly committed with quality management program compare to Non TQM based company. Almost 14.87% people from TQM based company strongly agreed that their management actively involved in company's vision, goals, plans and values for quality program. But this rate is very low as 10.99% in Non TQM based company. Also, the lowest is 10.78% people from Non TQM based company think that their Top management actively involved in

quality planning. Almost 13.58% people think that their top management is giving financial support to their quality implementation program. Also quality priority of TQM based got second highest response, 13.58% people strongly agree with this but this rate is only 11.87% in Non TQM Company.

2. Education and Training

This chart shows the mean of Top managements knowledge Update, Training program Coverage, training on total quality concept and continuous training. Among all company TQM based company have highest implementation rate compare to non TQM Company.
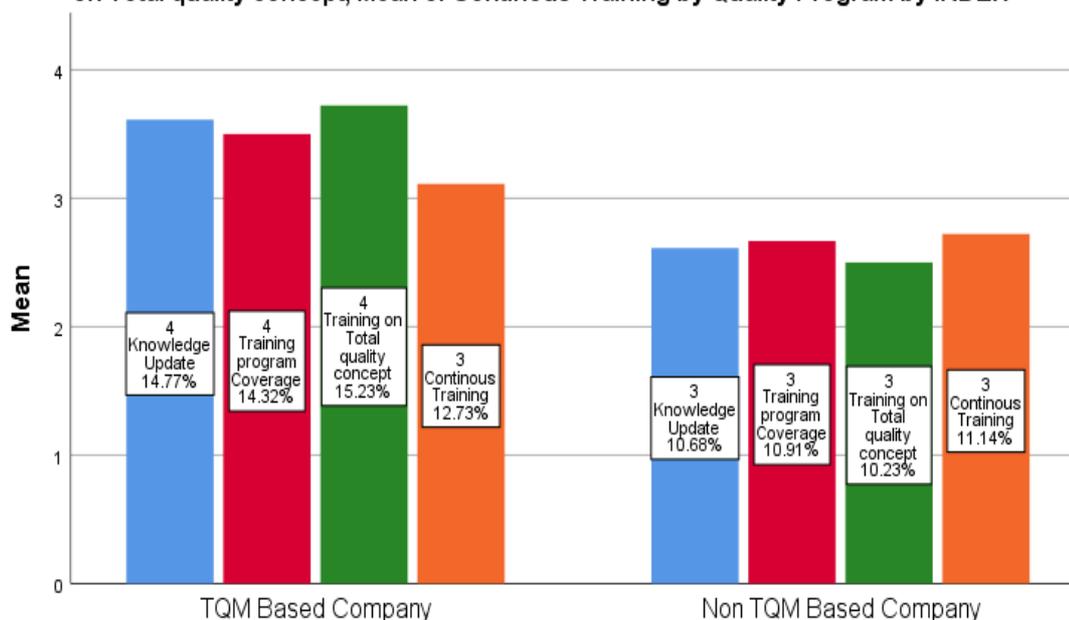
Figure 3. 3 Education and Training

As we can see 15.23% agreed that TQM Based Company's employees are trained on total quality concept. But this rate is lowest is lowest in non TQM company as only as 10.23%. Secondly, top management are highly committed with employees knowledge update because 14.77% employees from TQM based company agree that their top management update their knowledge from time to time. On the other side, this rate is only 10.68% in non TQM based company. Training program coverage is 14.32% in TQM and 10.91% in Non TQM based company. Finally we have been found that,

continuous traınıng rate on TQM Company is 12.73% and in non TQM the rate is 11.14%.

3. Customer Focus

This chart shows the value of mean like, customer service improvement program availability, the consideration system of customer feedback and the availability of customer communication mechanism. Among 36 company TQM based company have highest implementation rate compare to non TQM Company except program for customer service which got high score from Non TQM Company.
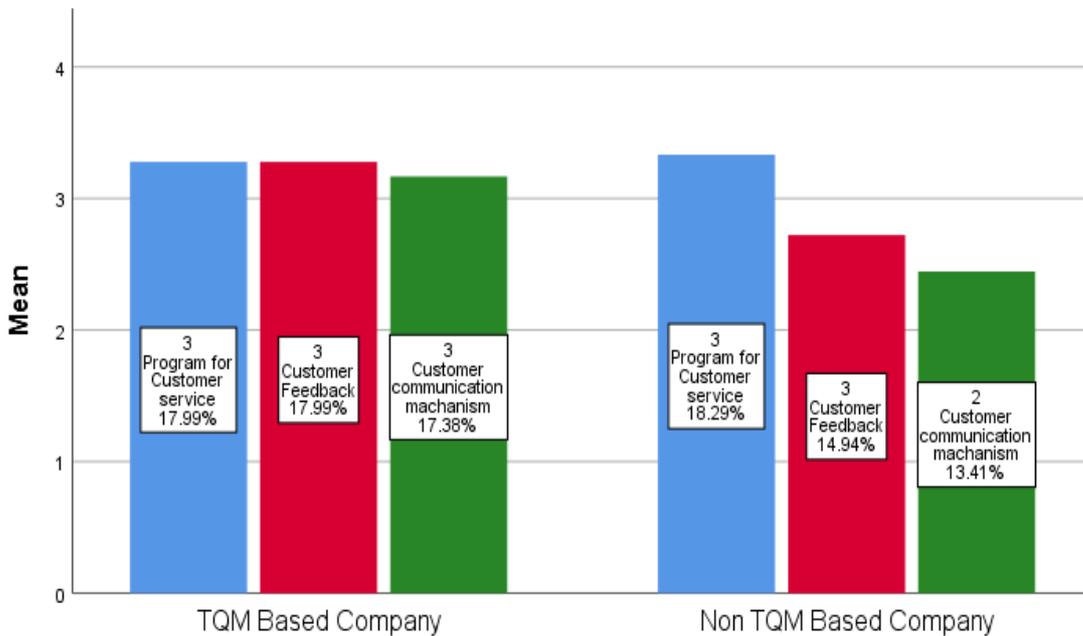
Figure 3. 4 Customer Focus

As we can see 18.29% non-based companies have customer service program for their customer. We have found that nine company does not have any customer service program. On the other hand lowest response 13.41% has been found as customer communication mechanism in Non TQM Company but in TQM based company this rate is 17.38%. Also, only 14.94% employees of Non TQM agreed that customer feedback plays a very important role. But this rate is higher as 17.99% in TQM based company.

Table 3. 4 Customer Service program Availability

		Frequency	Percent	Valid Percent	Cumulative Percent
V	Disagree	9	25.0	25.0	25.0
	Neutral	10	27.8	27.8	52.8
	Agree	14	38.9	38.9	91.7
	Strongly Agree	3	8.3	8.3	100.0
	Total	36	100.0	100.0	

4. Employee Empowerment or Involvement

This chart shows the value of mean of Regular meeting and Information campaign, Employee Involvement, Quality Goals in Quality policy and Workers participation in Quality Program Among all company TQM based companies have highest empowerment and involvement rate compare to non TQM Company.
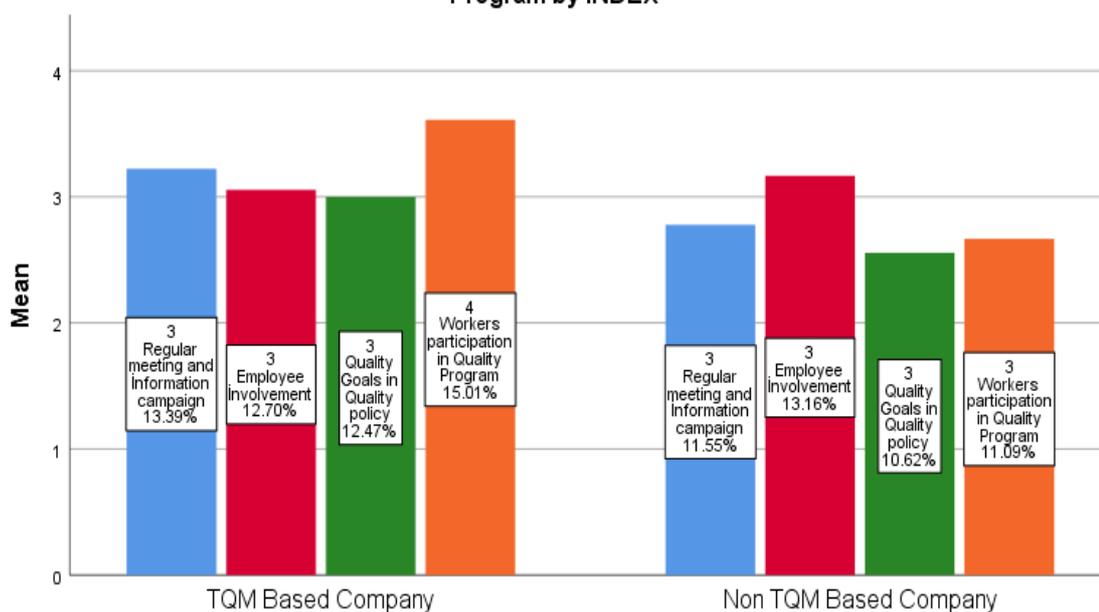
Figure 3. 5 Employee Empowerment or Involvement

As we can see all TQM Based Companies have highest worker participation in quality program which is 15.01%. But the rate is only 11.09% in Non TQM based company. Secondly employee involvement is higher in non TQM based company which is

13.16% in TQM based company and 12.70% in TQM based company. All TQM based company do regular meeting and information campaign because the rate is 13.39%. On the other hand, this rate is very close as 11.55% in Non TQM based company. The average mean is 3 in both TQM based and Non TQM Company based on their employee empowerment.

5. Continuous Improvement

This chart shows some important factors of continuous improvement such as segregating system, floor conditioning, and labelling and system record management. Among all company TQM based company have highest implementation rate compare to non TQM Company. Among all the company the highest response rate got by floor condition in TQM Company, 15.30% employees agreed this. On the other hand non TQM Company's floor are not good as TQM Company that's why the rate is 10.56%. In non TQM based company labelling is not that much important that's why it got lowest 10.34% response rate. In TQM Company, 13.79% employees agree that they have a system for segregating system. In non TQM based company average people are disagree that which mean most of them don't have this kind of system. The average mean is 4 in TQM based and only 3 in Non TQM Company based on their overall continuous improvement.
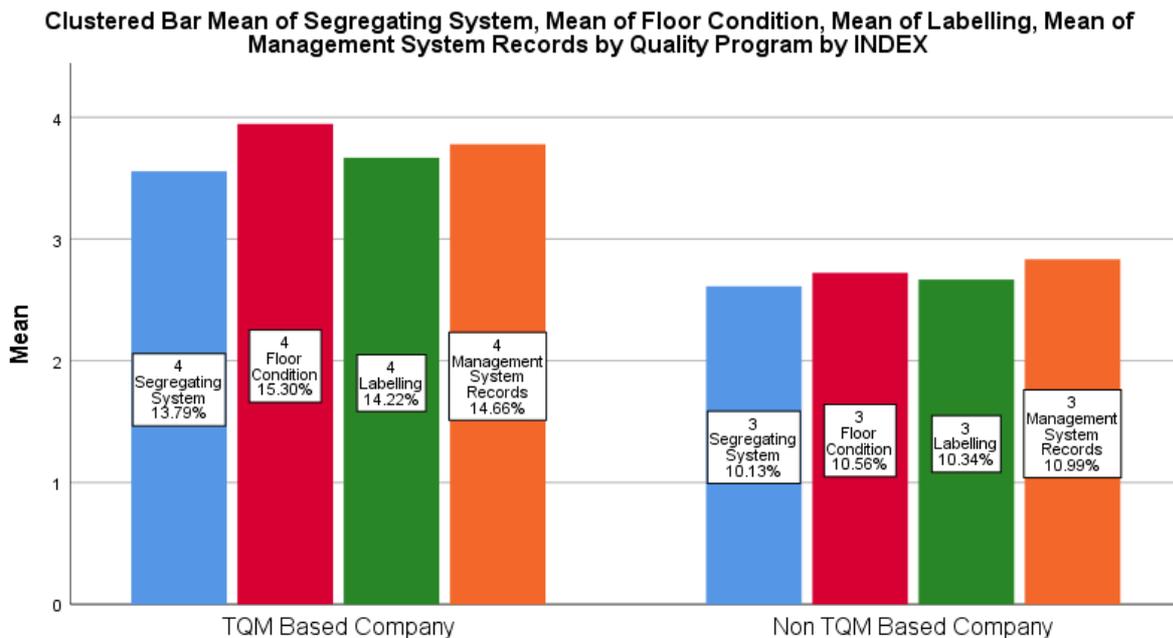
Figure 3. 6 Continuous Improvement

6. Incentive and Recognition system

This chart shows TQM and non TQM based companies inventory and Recognition system which consist of some question like ISO 9000 certification, award for quality management, incentives for employees and reward for innovation. Among all company TQM based company have highest implementation rate compare to non TQM Company. Almost 14.19% employees agree and strongly agree that they have ISO 9000 certificate. On the other hand from the survey it has been proved that non TQM based company have lowest ISO 9000 certificate. That's why 9.46% employees disagree with this. Reward for innovation has been found second lowest in non TQM based company, which is 11.61% but it is almost near as TQM based company. Award for quality management and incentives for employees are 13.98% and 13.76% in TQM and 11.61% and 12.26% in non TQM Company. The average mean is 4 in TQM based and only 3 in Non TQM Company based on their overall incentive and recognition system.
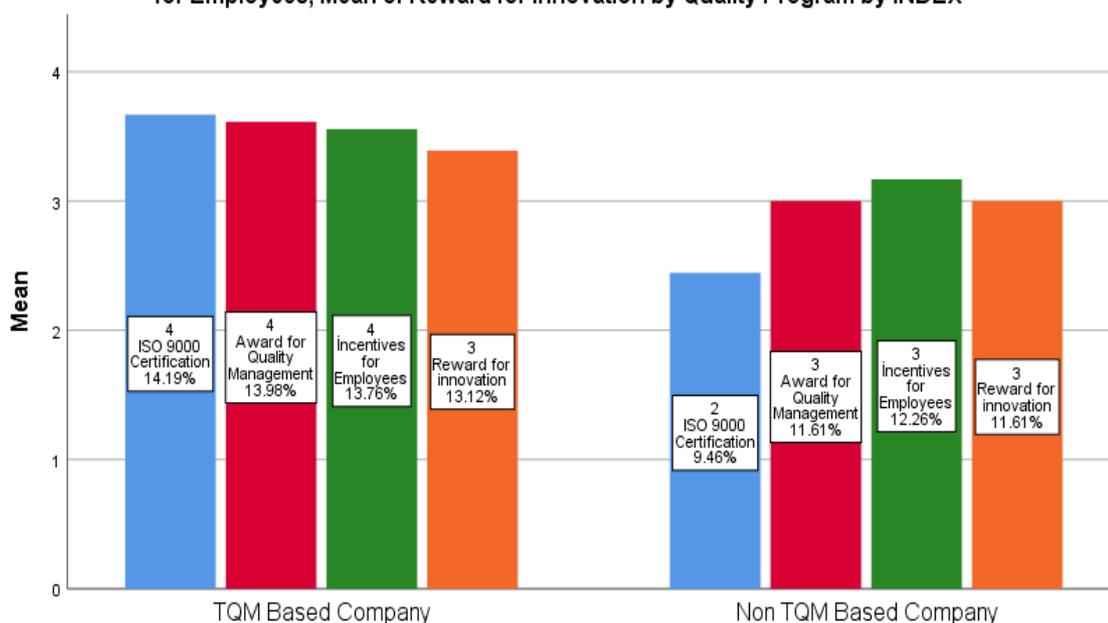
Figure 3. 7 Incentive and Recognition system

3.9.The mean degree of usefulness for quality activities implementation

After comparing results of TQM and non TQM based it is now very important to understand the degree of usefulness of quality factors in those organization. Also it will help us to understand either they are actually implementing TQM factors or not.

Table 3. 5 : The mean degree of usefulness for quality activities

		N	Mean	Std. Deviation
High (3.58 – 3.36)	Suggestions from employees	36	3.53	1.082
	Skills levels of employees	36	3.47	1.158
	Occurrence of accidents	36	3.36	1.125
	Incentives for Employees	36	3.36	1.046
Moderate (3.33 – 3.08)	Floor Condition	36	3.33	1.265
	Active involvement	36	3.33	1.069
	Award for Quality Management	36	3.31	1.064
	Management System Records	36	3.31	1.261
	Program for Customer service	36	3.31	.951
	Quality priority	36	3.28	.974
	Absenteeism rate	36	3.28	1.162
	Employees Attitudes	36	3.25	1.079
	Brainstorming	36	3.25	1.273
	Cause and Effect Diagrams	36	3.22	1.222
	Financial Support	36	3.22	.989
	Reward for innovation	36	3.19	1.238
	Labelling	36	3.17	1.254
	Control Charts	36	3.17	1.254
	Quality of suppliers products	36	3.17	1.028
	Teamwork and cooperation	36	3.14	1.125
	Workers participation	36	3.14	1.175
	Employee Involvement	36	3.11	1.260
	Knowledge Update	36	3.11	1.090
	Training on Total quality concept	36	3.11	1.166
	Segregating System	36	3.08	1.251
	Training program Coverage	36	3.08	1.131
	ISO 9000 Certification	36	3.06	1.120
	Quality planning	36	3.06	.893
	Customer Feedback	36	3.00	.986
	Regular meeting	36	3.00	1.095
	Continuous Training	36	2.92	1.131
	Customer communication mechanism	36	2.81	1.064
	Quality Goals in Quality policy	36	2.78	1.149
	Valid N (list wise)	36		

The quality factors presented in the questionnaire are consisted of quality principles which have been summarized in Table 3.5. This table will show us highest quality initiatives and lowest quality initiatives, which have been implemented by those companies.

Results of mean degree of usefulness and Standard Deviation for quality activities implementation

Overall, we have been divided total 33 questions results in 3 stage high, moderate and low in table 3.5. Where high quality implementation rate mean score is within 3.58 to 3.36. The four quality activities with the highest execution rate were the Suggestions from employees, Skills levels of employees, Occurrence of accidents and Incentives for Employees. According to Table 3.5, the top degree of practice is Suggestions from employees with a mean of 3.58 which proved that employee's suggestion has been improved after using TQM program. Second highest implementation is Skills of employees, which proved that employees skill have been improved after adopting TQM method have very positive attitude towards quality and employees want to improve quality. Occurrence of accidents and Incentives for Employees came next with 3.36 mean score.

The moderate quality implementation rate mean score is within 3.33 to 3.06. It have started with Floor Condition and finish with Quality planning. The moderate degree of practice consist of so many quality factors. So we can say that companies are implementing quality as much as possible. Also companies are trying to maximize their resources so that that they can adopt with the changing environment and can maintain high profit margin. Lastly, by seeing the score of mean we can say that company is using problem solving techniques in moderate level such as control charts and brainstorming.

The low quality level started with implementation of ISO 9000 which has mean score is 3.06 and also it has high standard deviation which proved that many company does not have ISO 9000. Company who have implemented ISO 9000 they also fulfilled the requirement of ISO 9000.

The lowest mean score is within 3.07 to 2.58. We can say Customer Feedback, Regular meeting and Information campaign, continuous training, Customer communication

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mechanism and Quality Goals in Quality policy have taken place but it is very low compare to all other quality activity.

Table 3. 6 The mean result of each item in questionnaire

Factor	TQM Based Company			NON TQM Based Company		
	Item no.	Mean	Overall mean	Item no.	Mean	Overall mean
Top Management Commitment	TMC1	3.50		TMC1	3.06	
	TMC2	2.83		TMC2	2.83	
	TMC3	3.33	3.29	TMC3	2.78	2.90
	TMC4	3.50		TMC4	2.94	
Education and Training	ET1	3.61		ET1	2.61	
	ET2	3.50	3.49	ET2	2.67	2.75
	ET3	3.72		ET3	2.50	
	ET4	2.92		ET4	3.22	
Customer Focus/ Orientation	CF1	3.28		CF1	3.33	
	CF2	3.28	3.24	CF2	2.72	2.83
	CF3	3.17		CF3	2.44	
Employee Empowerment	EE1	3.22		ET1	2.78	
	EE2	3.06		ET2	3.17	
	EE3	3.00	3.22	ET3	2.56	2.79
	EE4	3.61		ET4	2.67	
Continuous Improvement	CI1	3.56		CI1	2.61	
	CI2	3.94		CI2	2.72	
	CI3	3.67	3.74	CI3	2.67	2.71
	CI4	3.78		CI4	2.83	
Fact-based Management	FBM1	3.78		FBM1	2.56	
	FBM2	3.78	3.60	FBM2	2.72	2.76
	FBM3	3.44		FBM3	3.00	
Incentive and Recognition system	IRS1	3.67		IRS1	2.44	
	IRS2	3.61		IRS2	3.00	
	IRS3	3.56	3.56	IRS3	3.17	2.90
	IRS4	3.39		IRS4	3.00	
Operation Performance Measure	OP1	3.39		OP1	3.17	
	OP2	3.78		OP2	3.28	
	OP3	3.67		OP3	3.28	
	OP4	3.39	3.48	OP4	3.33	3.15
	OP5	3.28		OP5	3.00	
	OP6	3.56		OP6	2.94	
	OP7	3.28		OP7	3.06	

On the other hand, we know that low standard deviation represent the value are so close and a large standard deviation indicate the value is farther away. In table 3.6, Brainstorming has the highest standard deviation, which is 1.27. That's why we can say that, most of the employees from TQM and Non TQM have given answers which have highest variety and it is also far away from the value of mean. On the other hand, we got lowest Standard deviation in Quality planning which is 0.893. Because most of

the employees in TQM and Non TQM believe that their management emphasis on quality plan regularly.

3.10. The Level of Implementation of Quality Management Principles

The primary research of the survey was comparison between TQM and Non TQM based company, that's why the overall result of this survey has been brought forward in following table.

Table 3.6 is consisted of 6 basic Principles of total quality management. By seeing table, we can easily understand the implementation of TQM principles in TQM and Non TQM Company in Bangladesh. Also, the various means of importance have been analyzed. By comparing both side we can say that, In TQM based company have higher implementation rate compare to non TQM Company. Also, the overall means for each principles have been calculated.

Table 3. 7 Ranking of TQM factors in TQM companies

Rank	Factor	Description	Mean
1	CI2	Floor Condition	3.94
2	CI4	Management System Records	3.78
3	FBM1	Control Charts	3.78
4	FBM2	Brainstorming	3.78

Table 3. 8 Ranking of TQM factors in Non TQM companies

Rank	Factor	Description	Mean
1	CF1	Program for Customer service	3.33
2	OP4	Occurrence of accidents	3.33
3	OP2	Suggestions from employees	3.28
4	OP3	Skills levels of employees	3.28

Table 3.7 and table 3.8 are based on the importance of TQM factors. The highest mean score started from 3.94 and finished in 2.83 in TQM Company. But totally opposite things happens in Non TQM Company when mean value started in 3.33 and finished in 2.44. So according to importance we can say that Floor Condition (3.94), Management System Records (3.78), Control Charts (3.78) are highly practice in TQM based company. On the other hand, we can say that Program for Customer service

(3.33), Occurrence of accidents (3.33), Suggestions from employees (3.28) are highly practice in Non TQM based company though this practice is very lower than TQM based company. So we can concluded that TQM Company have higher degree of practice compare to Non TQM Company.

3.11. Analysis of TQM principles based on importance

The means of survey questions has been analyzed successfully. First, the mean degree of usefulness for quality activities has been calculated. After that mean value of each items has been carried out based on TQM and non TQM Company and all value have been summed up based on TQM principles. Now it becomes easy to understand that which principles are widely used by Bangladeshi SME Company.

Table 3. 9 Implementation of TQM principles in TQM Company

Rank	Description	Mean
1	Continuous Improvement	3.74
2	Incentive and Recognition system	3.56
3	Education and Training	3.49
4	Top Management Commitment	3,29
5	Customer Focus/ Orientation	3.24
6	Employee Empowerment	3.22

TQM principles based on Implementation in TQM Company has been given on table 3.9. The overall mean score started from 3.74 and finished at 3.24. Continuous improvement has been ranked as most popular TQM principles in Bangladeshi TQM Company with 3.74 mean score. Also, Incentive and Recognition system (3.56) and Education and Training (3.49) are also implementing successfully but not as popular as first one. While *Customer focus (3.24) and Employee Empowerment (3.22)* were the two least important.

Another aspect of investigation was TQM principles based on Implementation in Non TQM Company which has been given on table 5.13. As we can see all mean value in non TQM Company are lower than TQM Company in every case. Moreover, Top Management Commitment and Incentive and Recognition system are consider as the most popular TQM principles with highest mean score 2.90 which were widely used

in Bangladeshi Non TQM company. While Education and training (2.75) and Continuous improvement (2.75) were the two least important.

Table 3. 10 Implementation of TQM principles in Non TQM Company

Rank	Description	Mean
1	Top Management Commitment	2.90
2	Incentive and Recognition system	2.90
3	Customer Focus/ Orientation	2.83
4	Employee Empowerment	2.79
5	Education and training	2.75
6	Continuous Improvement	2.71

3.12. CRONBACH'S ALPHA

Cronbach's alpha normally tries to identify internal consistency. It is a process of finding out how closely a set of items are related to each other. It also measure the high reliability scale. An alpha with high value does not measure either it is dimensional or not. Rather its measure internal consistency. There is another way to check dimensionality which is called exploratory factor analysis.

Table 3. 11 Case Processing Summary of Cronbach's Alpha

		N	%
Cases	Valid	36	100.0
	Excluded	0	.0
	Total	36	100.0
a. List wise deletion based on all variables in the procedure.			

Table 3. 12 Reliability Statistics of Cronbach's Alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.777	.776	33

The results of α coefficient of reliability ranges from 0 to 1. If there are no correlation or variance among them then the result will be $\alpha = 0$; and, if all of the items have high covariance's, then α will approach 1 which defines that the items have highest correlation with each other.

Table 3.11 is the case processing summary of Cronbach's alpha. Where we can see total sample size is 36 and there are no excluded items.

The table 3.12 explained that the Cronbach's Alpha for the thirty six items is .777, suggesting that the items have relatively high internal consistency. (Note that a reliability coefficient of .70 or higher is considered "acceptable" in most social science research situations confirmed by Witold Orlik (2013). In other words, we can say that though those items have higher the coefficient, so its means the more items have shared covariance and probably measure the same underlying concept.

3.13. Test of Hypothesis based on Significance difference of means

This section will discuss and analysis the results of our previous hypothesis. Also we have tasted our hypothesis trough T-Test which is the one of the most popular form of comparison analysis.

First Hypothesis - To test for TQM practices have significant difference between TQM based SMEs and Non TQM based SME (for overall respondents based on TQM principles).

- Ho : $\mu_1 - \mu_2 = 0$; i.e. there is no differences between TQM based SMEs and Non TQM based SME (for overall respondents based on TQM principles).
- H_1 : $\mu_1 - \mu_2 \neq 0$; i.e. there is a significant differences between TQM based SMEs and Non TQM based SME (for overall respondents based on TQM principles).

Second Hypothesis - To test for SMEs adopting TQM approach which have significance difference in employee participation, recognition and reward, and education and training compare to non-TQM based SMEs.

- Ho : $\mu_1 - \mu_2 = 0$; i.e. there is no significant differences between employee participation, recognition and reward, and education and training of TQM based SMEs and Non TQM based SMEs.
- H_1 : $\mu_1 - \mu_2 \neq 0$; i.e. there is a significant difference between employee participation, recognition and reward, and education and training of TQM based SMEs and Non TQM based SMEs.

Third Hypothesis - To test for a significant difference between SMEs adopting TQM approach will have greater operational performance compare to non-TQM based SMEs.

- Ho : $\mu_1-\mu_2 = 0$; i.e. there is no significant difference in operational performance between SMEs adopting TQM approach compare to non-TQM based SMEs.
- H_1 : $\mu_1-\mu_2 \neq 0$; i.e. there is a significant difference in operational performance between SMEs adopting TQM approach compare to non-TQM based SMEs.

3.13.1. First Hypothesis Test

To test for TQM practices which have significant difference between TQM based SMEs and Non TQM based SME or not. (For overall respondents based on TQM principles).

The first t-test tried to find out the difference between the two mean of Non TQM and TQM companies TQM Principles. It was a paired sample T test. The result of the first t- test is presented in Table 3.13.

Table 3. 13 Paired Samples Statistics for Hypothesis 1

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	NONTQM	2.8039	23	.24548	.05119
	TQM	3.4496	23	.26451	.05516

Table 3. 14 Paired Samples Test for Hypothesis 1

		Paired Differences					t	df	Sig.(2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	NONTQM - TQM	-0.64565	.38889	0.08109	-0.81382	-0.47748	-7.96	22	.000

- If P Value < 0.05 than reject Null Hypothesis (Ho) and accept alternative hypothesis (H1).
- If P Value > 0.05 than reject Alternative Hypothesis (H1) and accept Null hypothesis (Ho).

This paired sample T test in 3.14 table, the mean for the NON TQM is 2.8039. The mean for the TQM is 3.4496. The standard deviation for the NON TQM is 0.24548

and for the TQM is 0.26451. The number of participants in each condition (N) is 23. This paired sample T test consisted of 23 questions which are the combination of 6 Basic principles of TQM. That's why the sample size is 23. The t-test showed that if there is a significant difference between Non TQM based and TQM based companies TQM principles at 0.05 significant level with 95% Confidence Interval of the Difference. At the end, we found that Sig. (2-tailed) value is less than p-value 0.05. It means, we can say that the result is very significant, so we are rejecting Null hypothesis and accepting alternatives hypothesis. In other word we can conclude that Bangladeshi companies who have applied TQM, those are practicing TQM principles regularly compare to Non TQM companies.

3.13.2. Second Hypothesis Test

To test for SMEs adopting TQM approach will have greater employee participation (EE2), recognition and reward (EE3), and education and training (ET4) compare to non-TQM based SMEs. (For overall respondents based on this.

The second t-test tried to find out if there are any significance difference between the two mean of Non TQM and TQM companies employee participation (EE2), recognition and reward (EE3), and education and training (ET4). It was a paired sample T test. The result is shown in Table 5.20.

Table 3. 15 Paired Samples Statistics for Hypothesis 2

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	NONTQM	2.8167	3	.31628	.18260
	TQM	3.0567	3	.05508	.03180

Table 3. 16 Paired Samples test for Hypothesis 2

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	NONTQM - TQM	-.24000	.30414	.1755	-.99552	.51552	-1.367	2	.305

- If P Value < 0.05 than reject Null Hypothesis (Ho) and accept alternative hypothesis (H1).
- If P Value > 0.05 than reject Alternative Hypothesis (H1) and accept Null hypothesis (Ho).

This paired sample T test in 5.20 table, the mean for the NON TQM is 2.8167. The mean for the TQM is 3.0567. The standard deviation for the NON TQM is 0.31628 and for the TQM is 0.05508. This paired sample T test consisted of 3 questions which are employee participation (EE2), recognition and reward (EE3), and education and training (ET4). That's why the sample size is 3. The t-test showed that the significant difference between Non TQM based and TQM based company at 0.05 significant level with 95% Confidence Interval of the Difference. At the end, we found that Sig. (2-tailed) value is 0.305 which is greater than p-value 0.05. It means, we can say that the result is not significant, so we are rejecting alternative hypothesis and accepting null hypothesis. Null hypothesis says there is no significance difference between TQM and Non TQM companies, companies who follows TQM approach does not have greater employee participation, recognition and reward, and education and training compare to non-TQM based SMEs. In other word we can conclude that In Bangladesh both TQM and Non TQM Company both have similar employee participation, recognition and reward, and education and training.

3.13.3. Third Hypothesis Test

To test for a significant difference between SMEs adopting TQM approach will have greater operational performance compare to non-TQM based SMEs. The third t-test tried to find out the differences between the two mean of Non TQM and TQM companies operational performance. In this thesis, operational performance measurement data have been collected through survey questionnaire by question number from OP1 to OP7. After collecting data we have done a paired sample T test. The result is presented in Table 3.17 and 3.18.

This paired sample T test in 3.17 table presented that, the mean for the NON TQM is 3.1514. The mean for the TQM is 3.4786. The standard deviation for the NON TQM is 0.15345 and for the TQM is 0.19523. The sample size (N) is 7. This paired sample T test consisted of 7 questions which are Absenteeism rate, Suggestions from

employees, Skills levels of employees, Occurrence of accidents, Teamwork and cooperation, Employees Attitudes, Quality of supplier's products.

Table 3. 17 Paired Samples Statistics for hypothesis 3

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	NONTQM	3.1514	7	.15345	.05800
	TQM	3.4786	7	.19523	.07379

Table 3. 18 Paired Samples test for hypothesis 3

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	NONTQM - TQM	-.32714	.18980	.07174	-.5026	-.15161	-4.560	6	.004

The t-test has been carried out at 0.05 significant level with 95% Confidence Interval of the Difference. At the end, we found that Sig. (2-tailed) value is 0.004 which is less than p-value 0.05. It means, we can say that the result is very significant, so we are rejecting Null hypothesis and accepting alternatives hypothesis. Alternatives hypothesis says there is a significance difference between TQM and Non TQM companies, companies who follows TQM approach have greater operational performance compare to non-TQM based SMEs. In other word we can conclude that Bangladeshi companies who have applied TQM, those have greater operational performance compare to non-TQM based SMEs.

Table 3. 19 Hypothesis result

Name of the Hypothesis	P value	Status
First Hypothesis	P Value < 0.05	Reject Null Hypothesis (Ho) and accept alternative hypothesis (H1)
Second Hypothesis	P Value > 0.05	Reject Alternative Hypothesis (H1) and accept Null hypothesis (Ho).
Third Hypothesis	P Value < 0.05	Reject Null Hypothesis (Ho) and accept alternative hypothesis (H1)

3.14. Conclusions

The following chapter has described the research methodology in details like from the beginning to end. It has also explained all the tools and techniques were using during the data collection period. During this data collection period we have been lots of difficulties. Many companies totally close their door and completely denied to share any kind of information's with us because of their privacy issue. It can be said that the design of questionnaire was one of the most important parts of this research.

CHAPTER FOUR

RESULTS DISCUSSIONS AND CONCLUSIONS

4.1.Summary

The results of the statistical analysis have been given in the upper section. It would be necessary to summarize them in point so that anyone can understand it so easily. That's why this discussion has breakthrough in 5 section which are General profile of respondent, Comparison of Six TQM Principles mean, Results of mean degree of usefulness for quality activities implementation based on importance, The Level of Implementation of Quality Management Principles, Test of Hypothesis based on Significance difference of means and Analysis of the Results of Cronbach Alpha.

4.2.General Profiles

This section has provided the overview the analysis. Certain points should need to be outlined.

➢ Among 110 companies we got 36 useable responses from our respondent and those were being used for analysis

➢ The response rate of the survey was 35.45% where, 47% was small companies and 53% were from medium industry.

➢ Among the SMEs, 20.5% industries are from electronics industry, 12.8% industries are from RMG and pharmaceutical and 7.7% are from chemical and technological based industry.

➢ Among 36 companies 18 company have certified quality certificate which is ISO 9000 series.

➢ Among 36 companies 18 company were TQM based company and rest of them were based on Non TQM Company.

4.3.Comparison of Six TQM Principles mean

We know that Total quality management is consist of six principles, those are Top Management Commitment, Education and Training, Customer Focus/ Orientation, Employee Empowerment/ Involvement, Continuous Improvement and Incentive and

Recognition system. We have compare the mean of this principles among TQM and Non TQM companies.

The comparison is presented through clustered Bar Chart. The results are following

➢ TQM Based Company's top management are highly committed with quality management program compare to Non TQM based company. Almost 14.87% people from TQM based company strongly agreed that their management actively involved in company's vision, goals, plans and values for quality program. But this rate is very low as 10.99% in Non TQM based company.

➢ TQM Based Company's top management are highly committed with employee's knowledge update and training on Total quality concept because 14.77% employees from TQM based company agree that their top management update their knowledge and employees are trained in total quality concept from time to time.

➢ As we can see 18.29% non-TQM based companies have customer service program for their customer. We have found that nine company does not have any customer service program. On other hand this rate is 17.99% in TQM Company.

➢ All TQM Based Companies have highest worker participation in quality program which is 14.87%. But the rate is only 10.98% in Non TQM based company. Secondly employee involvement is 14.42% in TQM based company and 12.13% in TQM based company

➢ For Continuous improvement factors, among all the company the highest response rate got by floor condition in TQM Company, 15.30% employees agreed this. On the other hand non TQM Company's floor condition are not good as TQM Company that's why the rate is 10.56%. Also the plant has signboards and labels for easy location and identification of various departments, inventory, machinery and equipment. But in non TQM based company labelling is not that much important that's why it got lowest 10.34% response rate.

➢ Almost 14.19% employees agree and strongly agree that they have ISO 9000 certificate. On the other hand from the survey it has been proved that non TQM based company have lowest ISO 9000 certificate. That's why 9.46% employees disagree with this.

4.4.The mean degree of usefulness for quality activities implementation

The survey questionnaire is a combination of 33 quality factors which were used for analysis the mean of those activities. Based on the statistics, we can say that almost all Bangladeshi companies are using those quality factors. Along with this we have carried out the degree of usefulness of those activity. The results are as follows:

➢ The four quality activities which get highest response such as Suggestions from employees (3.53), Skills levels of employees (3.47), Occurrence of accidents (3.36) and Incentives for Employees (3.36).Those has the highest degree of usefulness based on the opinion of the respondents.

➢ There are 4 quality activities categorized in lowest degree of usefulness with mean value less than 3.07; Regular meeting and Information campaign (3.00), Continuous Training (2.92), Customer communication mechanism (2.81) and Quality Goals in Quality policy (2.78).

4.5.The Implementation of Quality Management Principles in TQM based company and Non TQM based

This section will discuss the mean value of practice of six quality management principles among Bangladeshi SMEs.

➢ Continuous improvement has been ranked as most popular TQM principles in Bangladeshi TQM Company with 3.74 mean score. Also, Incentive and Recognition system (3.56) and Education and Training (3.49) are also implementing successfully but not as popular as first one.

➢ While *Top Management Commitment (3.29) Customer Focus/ Orientation (3.24)* were the two least important.

➢ As we can see Top Management Commitment and Incentive and Recognition system are consider as the most popular TQM principles with highest mean score 2.90 which were widely used in Bangladeshi Non TQM company.

➢ While Employee Empowerment/ Involvement (2.75) and Continuous improvement (2.75) were the two least important.

4.6.Test of Significance on difference of means

After collecting data from the survey along with other test, three paired t test have been carried out based on three hypotheses. The result has been described briefly in this section. Several interesting facts are found and underlined below.

➢ After tasting first T-Test, we have found that there is a significance difference between the two mean values of quality management principles. So we have rejected Null hypothesis and accepted alternatives hypothesis. Alternatives hypothesis said that Total quality management principle practices have significant differences on Small and Medium Enterprises compare to enterprises which do not follow TQM. In other word we can conclude that Bangladeshi companies who have applied TQM, those are practicing TQM principles regularly compare to Non TQM companies.

➢ The second t-test intended to check if there are no significance difference between the two mean of Non TQM and TQM company's employee participation (EE2), recognition and reward (EE3), and education and training (ET4) at 0.05 significant level. We have found that the results are not significant, so we have accepted Null hypothesis and rejected alternatives hypothesis. Where Alternatives hypothesis said that there is no significance difference between TQM and Non TQM companies, companies who follows TQM approach does not have greater employee participation, recognition and reward, and education and training compare to non-TQM based SMEs. In other word we can conclude that In Bangladesh both TQM and Non TQM Company both have similar employee participation, recognition and reward, and education and training.

➢ The third t-test was examined if there are any significance difference between the two mean of Non TQM and TQM Company's operational performance. We have found that the results are very significance. That's why we have rejected Null hypothesis and accepted alternatives hypothesis. Alternatives hypothesis said that there is a significance difference between TQM and Non TQM companies, companies who follows TQM approach have greater operational performance compare to non-TQM based SMEs. In other word we can conclude that Bangladeshi companies who have applied TQM, those have greater operational performance compare to non-TQM based SMEs.

4.7. Analysis of the Results of Cronbach Alpha

Cronbach's alpha normally use to find out the internal consistency. It is a process of finding out either items are related to each other. It also measures the high reliability scale. An alpha with high value does not measure either it is dimensional or not. Rather its measure internal consistency. We know that Cronbach's alpha results should give anyone a number from 0 to 1 which is theoretically, but also it can give negative numbers as well. A negative number indicates that something is wrong with the dat. The general rule is that a Cronbach's alpha of .70 and above is good, .80 and above is better, and .90 and above is best (Witold Orlik, 2013).

We have found that the value of Cronbach's Alpha for the thirty six items is .777, which indicates that the items have relatively high internal consistency which can also consider as a good value.

4.8. Limitations of this Study

Similar with other study, this thesis has many short coming. For Example, the targeted companies were manufacturing organizations. In addition, we can say that all the employees who participated in this survey were from manufacturing industry such as Agricultural Food, RMG, Chemicals, Electronics, and Fabrics and so on.

Moreover, the questions on survey have been designed based on TQM principles and concept of TQM. There were no technical aspects have not been yet covered so far. That's why it is impossible to predict in what extend they are implementing those TQM concepts. In this survey we have tried to find out the measurement of quality activities those were frequently practiced by the SMEs. This research have tried to find out those current scenario of implementation of TQM principles in Bangladeshi SMEs. Time factor was another limitation. Though the study completed within only 6 months. Researcher have tried to cover a great extent of data collection, survey, analysis by using number of Formulas and Methods. Though it was not sufficient. The topic itself has many branches that's why the amount of time was not enough to carry on a proper research.

Although the data collection of questionnaire has been carried out through third party for time consumption purpose because the targeted country situated in different demographic area also data entry and analysis were carried out simultaneously. So we cannot deny that unintentional errors in data collection can consider as an area which can further be improved upon.

Due to time limitation we have constrained the sample size. It has been known to all that the larger the sample size it will represent the whole situation more clearly. Also many company totally denied to participate in the survey and they gave back our questionnaire as an intact. Hence we can say that the researcher tried his best to give an error free research.

4.9. Suggestions for Future Research

Before conducting this kind of research, it is important for future researcher to know certain points and shortcomings so that they can give an error free research.

The biggest shortcoming of the research was limited ability to investigating TQM principal adoptions. We have rely only on the survey data. We don't know either they are implementing those principles in the real life or not. So, future researcher can follow up this issue when they will conduct similar kinds of research. Also, the targeted group of this research were only manufacturing industry. That's why the output could be compromised if they use this data for larger extend. This area also further need to be look on. This will surely increase the level of outcome of TQM implementation within shorter time, resource and cost.

Moreover, we have found that how important is TQM implementation process. Its increase business performance, it reduces employee's absenteeism rate, also decrease the rate of occurrences of accident and overall increase company performance. So it would be easier for them to understand how TQM is changing the behavior of employees, genuine commitment that everyone should work towards quality and so on. But the success of following factors depends on how company implementing those and what extend they are implementing. Hence, future researcher should study those areas.

However, future researcher should work closely with the targeted company and they should introduce and design an effective framework so that they can carry the research

simultaneously and effective and successful manners. Beside that they should monitor the changes which will going to take place in time laps and should bring changes based on that in their research.

4.10. Conclusions

The major goal of this thesis was to find out the differences between TQM and non TQM in Bangladeshi SMEs along with current level of implementation of TQM principal among small and medium organizations of Bangladesh. We have also compare the performance between companies who have implemented TQM in their organizations and who did not adopt TQM in their organization and we have successfully analysis the differences through various mathematical terms.

At the end we can say that, this research has successfully revealed the differences between TQM and non TQM company's performances based on major TQM principles. We have found that non TQM companies are way behind compare to TQM Company. Adopting TQM principles are bringing positive changes in their performance. It is also suggested that further research is very necessary for those organization who are implementing TQM in their company especially the extent of their implementation under the framework of current SMEs Company.

On the other hand we have also found that being a TQM company does not follow TQM strictly. For some company TQM is just merely a certificate. Also we have found that some company have already increased their productivity in larger extend by following TQM principals though they are not TQM based company.

In short we can say that, this research will help future researcher and give a solid idea regarding the current trend of SMEs in Bangladesh. Along with this, it will increase the awareness of TQM concepts. Also all the discussion and idea whatever presented in this research would be very beneficial for their future work.

In conclusion, it needs to be mention that this research helped author to enrich core TQM concept and lastly taught many valuable lessons towards TQM principle.

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ANNEXES

PLAGIARISM REPORT

MOIN UDDIN RONY

ORIJINALLIK RAPORU

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