IMPACT OF ORGANIZATIONAL CULTURE ON TOTAL QUALITY MANAGEMENT IN CONSTRUCTION INDUSTRIES

THESIS SUBMITTED FOR THE MASTER OF SCIENCE DEGREE IN MANAGEMENT ENGINEERING

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DECEMBER - 2015
ACKNOWLEDGEMENT

First of all, I’m really grateful to GOD ALMIGHTY, without his graces and blessings this thesis would not have been possible.

It would not be possible to do a thesis without the motivation, help and support of people around me. But, only some of them it is possible to mention here particularly.

Among that, I would love to thank my parents, Mr. George A.M. & Mrs. Saniamma George and my brother Jinu George for giving me the unequivocal love and support throughout.

I profusely thank and express my deep sense of gratitude to my guide of this thesis Dr. Alessandro Brun, Professor, Dipartimento di Ingegneria Gestionale, Politecnico di Milano, for his unstinted support and guidance. I could not have imagined having a better adviser and mentor for my thesis. I’m grateful to express my special appreciation and thanks to him for the motivation and encouragement I received, you have been a tremendous mentor for me.

Special thanks to Politecnico di Milano that has given me an opportunity to experience world class education and it’s an honour to be a part of such a great and world renowned university. Also I express my gratitude for the Administration department for helping and making it a beautiful place for me. My love to Milan is never ending. Completing a degree from a huge and prestigious university like POLIMI is never be possible without my dearest friends and professors, who made the life easier, thank you all.

Last but not the least, my biggest thanks to Italy for giving me the chance to spend the best two years in my life on its adorable and beloved land. Also, special thanks to my classmates, hostel mates, all my friends, critics and family for their support in making a better me.

JINCE GEORGE
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1. ABSTRACT

This report aims to increase the understanding of the relation between quality management practices and organizational culture. This is done by a study with considering construction sector.

There is a need for an appropriate culture to support the scope of Quality Management. Customer focus, systems approach, teamwork, involved management and continuous improvement are the aspects of TQM that facilitate improved organisational success, growth, and competitiveness. Many companies are now complementing continuous improvement with innovation, which is seen as the successful exploitation of new ideas. A clear synergy appears between these two corporate success factors as they are often integrated under an appropriate corporate culture for exploitation. The results of this can support substantial improvements in business performance and competitiveness of the company. With this in mind, this paper discusses the concept of corporate culture, places this social construct within the arena of TQM, and highlights the relationships that exist among culture, quality, and competitiveness.

In the competitive environment of today, it is crucial to stay ahead of competition and continuously satisfy customers. Quality management practices have been widely implemented, and while some organizations experience great success, other initiatives have failed. Many studies have started questioning the universal application of quality management in all organizations, and they claim that some of the quality management practices are dependent on the organizational context, such as industry, firm size and country. Out of these, organizational culture is among those listed at the top. These studies indicate that the organizational context, and consequentially its culture, will have an impact on the outcome of implemented quality management practices. This motivated me to study the impact of organizational culture in quality management.

This paper discusses quality management practices and their potential in organizational cultures. The organizational culture is supporting several quality practices, which have been used to bring suggestions on how the unit can continue to develop their quality management. In order to achieve a higher performance in the process management practice, it is important to increase the feeling of empowerment among employees and to
involve the people closest to the process it the quality efforts at the unit. Much of the literature discussing the cultural impact on quality management practices agrees that an appropriate culture is needed to support quality practices, with TQM as an example. Even though TQM alone is a whole concept, it has to be aligned with the existing cultural setting at the company where it is implemented.

The quality management practices needs to be embedded in a supportive quality culture. When an organization would like to introduce TQM but lack an appropriate supportive culture the initiative will most likely fail. For instance, if employees do not feel empowered they might be afraid of stopping the production line right away when a defect product becomes visible.

Quality of processes, services and products can be the difference between success and failure in every firm irrespective of the sector it belongs to. Customer satisfaction and customer value have become the main concern of all organizations in the increasingly intensified competition for customers in today’s customer-centred era. As a result, many organizations are paying increasing attention to improve their overall quality. The quality improvements will lead to customer satisfaction and cost management that result in improved profits. As a step in an empirical study of quality management, this study incorporates the total quality management.

Since, organizational culture is directly affects the total quality management, this topic of study is very relevant and important in the current business market. This study paper takes into account construction sector under the study.

**Key words:** Organizational culture, Total quality management (TQM), quality control, quality assurance, inspection, construction industries, continues improvement, process management, leadership, customer satisfaction, involvement and commitment, quality management system (QMS), ISO standards.
2. Introduction

The construction industry globally is one of the largest contributors to Gross Domestic Product (GDP), as well as playing an important role in determining a country’s economic growth. According to a report on global forecasts for the construction industry, over the decade 2011 to 2020, it was observed that this sector currently accounts for more than 11% of global GDP and it is estimated that by 2020 it will account for 13.2% of the world’s GDP. Construction project activity has increased significantly in recent years, reflecting the combination of government financing for infrastructure facilities and private sector investment in housing and property development.

The results of a survey of quality in construction by the Federation Internationale des Ingenieurs-Conseils (FIDIC), has clearly indicated that the failure in construction quality is a problem worldwide. In the light of such reports and also due to the local shortfalls described before, the construction industries are forced to become more competitive, has enacted specific regulations relating to the application and implementation of total quality management systems, acknowledging that quality in construction is a major concern in the global construction industry. The implementation of TQM has become more widespread in the construction industry since the quality of civil engineering project work became an issue of concern to the Government, contractors, consultants, project customers and end-users. Quality management systems are becoming increasingly important to customers, who have developed a growing aspiration to engage qualified and professional construction companies, capable of meeting their specification requirements, and capable of giving better customer satisfaction. Quality management in the construction industry is different from that in manufacturing or other service industries, as in the construction industry it encompasses not only the quality of products, but also the total management approach to meet a defined purpose provided by clients.

Most of the companies in construction industry are certified ISO 9001 companies. The holding of an ISO 9001 certificate does not mean that a company is implementing an effective QMS; to do that requires a cultural shift. The change from a culture of building to the lowest quality level and then repairing inevitable defective work, to a culture of producing ‘right-first-time’ output, is required for the demonstration of achievement of successful quality
system application. There is a definite relationship between corporate culture and quality in construction projects, and in order to support the necessary elements of such a QMS, an appropriate corporate culture is a prerequisite. This relationship is mutually reinforcing and this means that if the corporate culture is good, the quality system will be applied appropriately, with the resulting products and services also being good.

The cultural factors, which are integrated into organisational management and policies, also play a major role in determining how effectively construction companies implement TQM. The cultural values which support quality system implementation need to be internally driven by the management and staff of construction companies. Hence, with a strong culture that gives an organisation a distinct identity and drives it to operate effectively, an effective implementation of the company QMS that also exhibits continuous improvement is expected. Such a system should be capable of meeting project owner requirements, and of providing a high level of customer satisfaction in the area of project delivery. The successful implementation of an ISO 9001 certified QMS requires a total change in organisational focus, even to the extent of adopting a new type of culture that must be focused on achieving greater customer satisfaction and improving the operational processes at all levels of the company. Effective QMSs and a strong corporate culture are mutually bound together, as is evidenced by the failure of many companies that are not strongly committed to continuous QMS improvement and ultimate customer satisfaction, being unable to implement quality practices and achieve quality outcomes, thereby resulting in a lack of high level competitiveness and organisational performance.
3. **Construction industry: An overview**

Construction industry is a sector of national economy engaged in preparation of land and construction, alteration, and repair of buildings, structures, and other real property. In general, there are three sectors of construction: buildings, infrastructure and industrial. Building construction is usually further divided into residential and non-residential (commercial/institutional). Infrastructure is often called heavy/highway, heavy civil or heavy engineering. It includes large public works, dams, bridges, highways, water/wastewater and utility distribution. Industrial includes refineries, process chemical, power generation, mills and manufacturing plants. There are other ways to break the industry into sectors or markets.

Engineering News-Record (ENR) is a trade magazine for the construction industry. Each year, ENR compiles and reports on data about the size of design and construction companies. They publish a list of the largest companies in the United States (Top-400) and also a list the largest global firms (Top-250, by amount of work they are doing outside their home country). In 2014, ENR compiled the data in nine market segments. It was divided as transportation, petroleum, buildings, power, industrial, water, manufacturing, sewer/waste, telecom, hazardous waste plus a tenth category for other projects.[8] In their reporting on the Top 400, they used data on transportation, sewer, hazardous waste and water to rank firms as heavy contractors.

The Standard Industrial Classification and the newer North American Industry Classification System have a classification system for companies that perform or otherwise engage in construction. To recognize the differences of companies in this sector, it is divided into three subsectors: building construction, heavy and civil engineering construction, and specialty trade contractors. There are also categories for construction service firms (e.g., engineering, architecture) and construction managers (firms engaged in managing construction projects without assuming direct financial responsibility for completion of the construction project).
3.1 Main processes in construction industries

Designing:

In the modern industrialized world, construction usually involves the translation of designs into reality. A formal design team may be assembled to plan the physical proceedings, and to integrate those proceedings with the other parts. The design usually consists of drawings and specifications, usually prepared by a design team including surveyors, civil engineers, cost engineers (or quantity surveyors), mechanical engineers, electrical engineers, structural engineers, fire protection engineers, planning consultants, architectural consultants, and archaeological consultants. The design team is most commonly employed by (i.e. in contract with) the property owner. Under this system, once the design is completed by the design team, a number of construction companies or construction management companies may then be asked to make a bid for the work, either based directly on the design, or on the basis of drawings and a bill of quantities provided by a quantity surveyor. Following evaluation of bids, the owner typically awards a contract to the most cost efficient bidder.

The modern trend in design is toward integration of previously separated specialties, especially among large firms. In the past, architects, interior designers, engineers, developers, construction managers, and general contractors were more likely to be entirely separate companies, even in the larger firms. Presently, a firm that is nominally an "architecture" or "construction management" firm may have experts from all related fields as employees, or to have an associated company that provides each necessary skill. Thus, each such firm may offer itself as "one-stop shopping" for a construction project, from beginning to end. This is designated as a "design build" contract where the contractor is given a performance specification and must undertake the project from design to construction, while adhering to the performance specifications.

Several project structures can assist the owner in this integration, including design-build, partnering and construction management. In general, each of these project structures allows the owner to integrate the services of architects, interior designers, engineers and constructors throughout design and construction. In response, many companies are growing beyond traditional offerings of design or construction services alone and are placing more
emphasis on establishing relationships with other necessary participants through the design-build process.

The increasing complexity of construction projects creates the need for design professionals trained in all phases of the project's life-cycle and develop an appreciation of the building as an advanced technological system requiring close integration of many sub-systems and their individual components, including sustainability. Building engineering is an emerging discipline that attempts to meet this new challenge.

**Financial advices:**

Construction projects can suffer from preventable financial problems. Underbids happen when builders ask for too little money to complete the project. Cash flow problems exist when the present amount of funding cannot cover the current costs for labour and materials, and because they are a matter of having sufficient funds at a specific time, can arise even when the overall total is enough. Fraud is a problem in many fields, but is notoriously prevalent in the construction field. Financial planning for the project is intended to ensure that a solid plan with adequate safeguards and contingency plans are in place before the project is started and is required to ensure that the plan is properly executed over the life of the project.

Mortgage bankers, accountants, and cost engineers are likely participants in creating an overall plan for the financial management of the building construction project. The presence of the mortgage banker is highly likely, even in relatively small projects since the owner’s equity in the property is the most obvious source of funding for a building project. Accountants act to study the expected monetary flow over the life of the project and to monitor the pay-outs throughout the process. Cost engineers and estimators apply expertise to relate the work and materials involved to a proper valuation. Cost overruns with government projects have occurred when the contractor identified change orders or project changes that increased costs, which are not subject to competition from other firms as they have already been eliminated from consideration after the initial bid.
Large projects can involve highly complex financial plans and often start with a conceptual estimate performed by a building estimator. As portions of a project are completed, they may be sold, supplanting one lender or owner for another, while the logistical requirements of having the right trades and materials available for each stage of the building construction project carries forward. In many English-speaking countries, but not the United States, projects typically use quantity surveyors.

**Legal consultation:**

A construction project must fit into the legal framework governing the property. These include governmental regulations on the use of property, and obligations that are created in the process of construction.

The project must adhere to zoning and building code requirements. Constructing a project that fails to adhere to codes does not benefit the owner. Some legal requirements come from malum in se considerations, or the desire to prevent things that are indisputably bad – bridge collapses or explosions. Other legal requirements come from malum prohibitum (Latin phrase used in law to refer to conduct that constitutes an unlawful act only by virtue of statute, as opposed to conduct evil in and of itself, or malum in se) considerations, or things that are a matter of custom or expectation, such as isolating businesses to a business district and residences to a residential district. An attorney may seek changes or exemptions in the law that governs the land where the building will be built, either by arguing that a rule is inapplicable (the bridge design will not cause a collapse), or that the custom is no longer needed (acceptance of live-work spaces has grown in the community).

A construction project is a complex net of contracts and other legal obligations, each of which all parties must carefully consider. A contract is the exchange of a set of obligations between two or more parties, but it is not so simple a matter as trying to get the other side to agree to as much as possible in exchange for as little as possible. The time element in construction means that a delay costs money, and in cases of bottlenecks, the delay can be extremely expensive. Thus, the contracts must be designed to ensure that each side is capable of performing the obligations set out. Contracts that set out clear expectations and clear paths to accomplishing those expectations are far more likely to result in the project flowing smoothly, whereas poorly drafted contracts lead to confusion and collapse.
Legal advisors in the beginning of a construction project seek to identify ambiguities and other potential sources of trouble in the contract structure, and to present options for preventing problems. Throughout the process of the project, they work to avoid and resolve conflicts that arise. In each case, the lawyer facilitates an exchange of obligations that matches the reality of the project.

**Interaction of expertise:**

Design, finance, and legal aspects overlap and interrelate. The design must be not only structurally sound and appropriate for the use and location, but must also be financially possible to build, and legal to use. The financial structure must accommodate the need for building the design provided, and must pay amounts that are legally owed. The legal structure must integrate the design into the surrounding legal framework, and enforce the financial consequences of the construction process.

**Procurement:**

Procurement describes the merging of activities undertaken by the client to obtain a building. There are many different methods of construction procurement; however the three most common types of procurement are traditional (design-bid-build), design-build and management contracting.

There is also a growing number of new forms of procurement that involve relationship contracting where the emphasis is on a co-operative relationship between the principal and contractor and other stakeholders within a construction project. New forms include partnering such as Public-Private Partnering (PPPs), private finance initiatives (PFIs) and alliances such as "pure" or "project" alliances and "impure" or "strategic" alliances. The focus on co-operation is to ameliorate the many problems that arise from the often highly competitive and adversarial practices within the construction industry. The influence of procurement methods appears to be a determining factor in the level of innovation in the construction industry, and the significance of increased use of alternative forms of procurement lies in the opportunity for increased R&D and innovation they provide.
Management procurement system:

In this arrangement the client plays an active role in the procurement system by entering into separate contracts with the designer (architect or engineer), the construction manager, and individual trade contractors. The client takes on the contractual role, while the construction or project manager provides the active role of managing the separate trade contracts, and ensuring that they complete all work smoothly and effectively together.

Management procurement systems are often used to speed up the procurement processes, allow the client greater flexibility in design variation throughout the contract, give the ability to appoint individual work contractors, separate contractual responsibility on each individual throughout the contract, and to provide greater client control.

3.2 Construction Industries in the twenty-first century

As we enter the twenty-first century, few would dispute that the construction industry has a poor image. Scenes of devastation as buildings collapse following earth tremors, due to poor construction and inadequate inspection, are only too familiar on our television screens. Reports of large-scale corruption involving contractors and governments are also commonplace. On a smaller scale, there are few householders who have not had some bad experience at the hands of some builders, who operate around the periphery of the industry and generate considerable criticism of the sector as a whole. All of these problems contribute to the poor image of the industry in the eyes of its clients and the public at large.

But the industry also has a poor image in the eyes of its workforce, or potential workforce, and it is this aspect that is of most concern. The poor image of work in the construction industry is generally thought to stem from the nature of the work, which is often described as “dirty, difficult and dangerous”. But the real reason why construction work is so poorly regarded has much more to do with the terms on which labour is recruited than the nature of the work itself. For many construction workers around the world the terms of employment have always been poor. But many others have seen a significant deterioration in the past 30 years, as the construction industry has led the way in the adoption of “flexible” labour practices.
The “outsourcing” of labour through subcontractors and other intermediaries is now the norm in most countries. This means that work in construction has become increasingly temporary and insecure, and workers’ protection (where it existed) has been eroded as large numbers are excluded from social security schemes. The increase in the practice of employing labour through subcontractors has also had a profound effect upon occupational safety and health and it has undermined collective bargaining agreements and training provision. The level of skill in the construction industry in some countries has fallen significantly as a result.

The image of the construction industry has suffered from these developments, not least in the eyes of its potential workforce. In much of the world, work in construction is not regarded as “decent work”. Lack of opportunities for training and skill formation contribute to the unattractiveness of a career in construction. Attracting new entrants is a major problem in countries where workers have alternatives (mainly, but not entirely, the richer ones). In both developed and developing countries difficulties are experienced in recruiting young, educated workers, as the quote at the beginning of the report makes clear.

The inability of the industry to attract workers and invest in training them has serious repercussions for the productivity and quality of construction products and hence for the ability of contractors to satisfy their clients’ needs. It is therefore of concern to both employers and workers. Labour shortages and lack of skills can also create pressures to replace labour by machines, through prefabrication and mechanization, thereby threatening the long-term potential of the construction industry to generate much needed employment. Hence there are linkages between the three issues of image, employment and skills. The report will focus on these linkages.

3.3 Challenges facing the Construction Industry

There are several important challenges facing the construction industry that are motivating the adoption of new technologies such as 3D rendering and simulation, model-driven design including building information modelling (BIM), standards for interoperability.
Global Climate Change:

The share of Americans calling global warming the most important environmental issue rose from 11 percent in 2003 to 35 percent in 2006 Global Warming Survey. In the United States alone, buildings account for 39% of total energy use, 68% of total electricity consumption, and 38% of total carbon dioxide emissions Green Building. The construction industry is faced with the challenge to replace or renovate buildings to minimize environmental impact, for example, achieving carbon neutrality, and at the same time yielding a respectable financial return on investment. Some people are calling for reducing fossil fuel consumption of buildings by 50 percent by the year 2010 with a goal of achieving carbon-neutral buildings by 2030 News. This requires new approaches to designing new buildings and renovating existing buildings. For example, the Leadership in Energy and Environmental Design Green Building Rating System LEED, developed by the U.S. Green Building Council (USGBC), provides a suite of standards for environmentally sustainable construction. Since its inception in 1998 and as of July 2007, LEED is now incorporated in 14,000 projects in 50 US States and 30 countries covering 1.062 billion square feet of development area (July 2007 USGBC figures).

Aging infrastructure:

Aging infrastructure is expected to be an increasing prominent issue in many parts of the world. Every two years the American Society of Civil Engineers (ASCE) prepares a Report Card for American Infrastructure. One of the sectors the ACSE evaluates is roads, highways, and transit. To put this in context, the ASCE estimates that traffic congestion costs the economy in lost productivity and wasted fuel. Even more seriously, the Federal Highway Administration (FHwA) reports that outdated and substandard road and bridge design, pavement conditions, and safety features are factors in 30% of all fatal highway accidents. In the US on average, there are more than 43,000 fatalities every year. The ASCE also reports that motor vehicle crashes cost U.S. citizens $230 billion per year, or $819 for each resident for medical costs; lost productivity; travel delay; and workplace, insurance and legal costs.
Shrinking workforce:

Statistics Canada predicts that in Canada by 2016 there will no longer be enough new workers to replace retirees. In the US a Conference Board study managing the Mature Workforce predicts that by 2010, the number of workers aged 35 to 44 will decline by 19%; aged 45 to 54 will increase 21%; and aged 55 to 64 will increase 52%. This is a world-wide phenomenon. The number of workers aged 35 to 44 is expected to decline by 27% in Germany, 19% in the U.K., 9% in Italy, 10% in Japan, and by 8% in China. A recent study from the American Public Power Association (APPA) Work Force Planning for the Public Power Utilities: Ensuring Resources to Meet Projected Needs reports that the loss of critical knowledge and the inability to find replacements with utility-specific skills are the two biggest challenges facing the industry. In the utility industry the average age of utility workers is close to 50 and by 2010, as many as 60 percent of today’s experienced utility workers will retire. A survey conducted in 2005 by the Carnegie Mellon University Electricity Industry found that human resources executives in the utility sector overwhelmingly listed the aging work force as their number one concern.

Declining Productivity:

The construction industry is highly competitive, and firms must continually improve their productivity to remain competitive. This challenge of continual productivity improvement has reached crisis proportions in the US where statistics published by US Bureau of Labour Statistics show that the productivity of the construction industry has actually declined in the last 40 years while non-farm productivity has increased by over 200% in the same period.
4. Organizational Culture

Organizational culture – the “personality” of an organization that guides how employees think and act on the job – is central to the values, beliefs, inter-personal behaviours, and attitudes to stakeholders that determine how the organization does its job. Culture is a key factor not only in achieving organizational goals, but in attracting and keeping desirable employees, creating a positive public image, and building respectful relationships with stakeholders.

4.1 Theoretical Background to the concept organizational culture

Social scientists have explored the notion of organisational culture as a perspective in organisational theory over the past decades. Brown (1998) states that “current interests in organisational culture stems from at least four different sources: climate research, national cultures, human resource management and from conviction approaches which emphasise the rational and structural nature of the organisation to be unable to offer a full explanation of organisational behaviour”.

Research findings by means of organisational climate surveys that were conducted in the 1970s suggest that organisational culture seems to be a sophisticated approach to understand the beliefs and attitudes of individual members about their respective organisations (Brown, 1998).

The origin of organisational culture from a national culture point of view is based, among others, on the work of Deal and Kennedy (1982). According to this view organisational culture is seen as being central to organisational success rather than factors such as structure, strategy or politics. As a result the attention shifted away from national cultures and focused more on organisational culture.

Interests in organisational culture from the human resource management and performance point of views stems from the fact that organisational culture was perceived to be offering a non-mechanistic, flexible and imaginative approach to understanding how organisations work (Brown, 1998). Consequently, organisational culture is considered to be the great “cure-all” for most organisational problems (Wilson, 1992).
Other theoretical development of the concept organisational culture includes studies conducted within the field of organisational theory.

These studies focused on the description and understanding of the concept organisation culture by using typologies or classifications, which include the following:

- Deal and Kennedy (1982) identified four generic types of cultures to describe organisational culture, namely the tough-guy/macho culture, the work-hard/play-hard culture, the bet-your company culture and the process culture.
- Handy (1985) described organisational culture by using four types of classification, namely power, role, task and person cultures.
- Schein (1985) used three levels to explain organisational culture, namely artefacts, values and basic underlying assumptions.
- Scholtz (1987) identified five primary culture typologies, namely stable, reactive, anticipating, exploring and creative.
- Hampden-Turner (1990) used four types of culture to describe organisational culture, namely role, power, task and atomistic cultures.
- Hofstede (1991) highlighted that cultures differ based on five dimensions, namely power distance, individualism/collectivism, uncertainty avoidance, masculinity/femininity and confusion dynamism.
- O’Reilly, Chatman and Caldwell (1991) presented seven primary characteristics to describe organisational culture, namely innovation and risk-taking, attention to detail, outcome orientation, people orientation, team orientation aggressiveness and stability.

The above-mentioned typologies of organisational culture provide broad overviews of the variations that exist between theorists in their description of this concept. The variations and differences have mainly evolved over time.
4.2 Definition of organizational culture

A basic definition of organisational culture is necessary to provide a point of departure in the quest for an understanding of the phenomenon. Martins and Martins (2003, p 380) state the general definition of organisational culture as “a system of shared meaning held by members, distinguishing the organisation from other organisations”.

In relation to the above definition, Arnold (2005, p 625) indicates that “organisational culture is the distinctive norms, beliefs, principles and ways of behaving that combine to give each organisation its distinct character”. These two definitions suggest that organisational culture distinguishes one organisation from another organisation. Therefore, organisational culture is to an organisation what personality is to an individual (Johnson, 1990).

Linking up with the above definitions, Schein (1985, p 9) also defines organisational culture as “a pattern of basic assumptions invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration that has worked well enough to be considered valid, and therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems”. This description highlights that organisational culture is created assumptions, which are accepted as a way of doing things and are passed on to new members of an organisation.

For new employees this would mean adaptive behaviour within the organisation that leads to new belief systems. This new and adaptive behaviour instilled through organisational values and beliefs are associated with rituals, myths and symbols to reinforce the core assumptions of organisational culture (Hofstede, 1991).

In relation to the above definition, Brown (1998, p 9) defines organisational culture as “the pattern of beliefs, values and learned ways of coping with experience that have developed during the course of an organisation’s history, and which tend to be manifested in its material arrangements and in the behaviours of its members”. This suggests that organisational culture is articulated in the organisation, in order to shape the way in which organisational members should behave.
However, this pattern of values, norms, beliefs, attitudes, principles and assumptions may be unwritten or non-verbalised behaviour that describe the way in which things get done; to give the organisation its unique character (Brown, 1998).

Given the various definitions of organisational culture which were discussed in this section, the adopted and relevant definition for this study is stated by Harrison (1993, p 11) as the “distinctive constellation of beliefs, values, work styles, and relationships that distinguish one organisation from another”.

In other words, organisational culture includes those qualities of the organisation that give it a particular climate or feel. As a result the distinct qualities of an organisation may manifest through four dimensions, namely power, role, achievement and support (Harrison, 1993).

4.3 Characteristics of organizational culture

The definition applies to organizations of virtually every kind – families, social clubs, work groups, companies, governments, and nations. Over time, each such group develops a set of tacit and explicit understandings, beliefs and practices. It might not be easy to explain exactly what the cultural characteristics of a particular group are, but all of its members understand and conform instinctively to its expectations.

As abstract as the concept of organizational culture may be, it is often grounded in clearly identifiable characteristics. These may include:

- **A shared understanding of the organization’s mission**: This may be evident in such things as: a formal charter or mission statement; explicit strategies, goals and principles; and staff beliefs and assumptions about why the organization does what it does.

- **Values that guide decision-making and activity at all levels in the organization**: For instance, it may be evident in the organization’s policies, public statements and activities that it values:
  - Safety – the physical safety of staff and the public
  - Security – the protection of information and other assets
• Integrity – the reputation of the organization for honesty, high ethical standards, reliable outputs, and impeccable methodologies
• Continuous improvement – with mistakes seen as learning opportunities
• Continuous learning – the creation of rich opportunities for staff to gain new knowledge and skills

❖ The focus and management style of senior officers: This is often evident in statements that senior managers make about organizational priorities, the management style that they embrace (e.g. Top-down? Consultative?), and staff perceptions about senior management’s main preoccupations and commitment to “walking the talk”.

❖ How employees think of their relationships with management, one-another, partner organizations, and clients: Are relationships predominantly adversarial, competitive, distrustful, collegial and mutually supportive, etc.?

❖ How an organization conducts its day-to-day business: Much can be learned about the culture of an organization by looking at such things as: its routine processes (e.g. does it routinely audit process effectiveness?); how are decisions made; how much responsibility is given to each layer / staff member in the organization; and, how flexible the organization is in dealing with tasks that are out of the ordinary.

When you put these things together, a distinctive organizational “personality” may become apparent even to casual observers. Organizations develop reputations for being, for example, bureaucratic or entrepreneurial, innovative or tradition bound, focused or diffuse in their interests, transparent or secretive, responsible and reliable or adventuresome and risky.

Certain elements of an organization’s culture may not be readily apparent, including beliefs, values, attitudes, and assumptions. Before embarking on a major change initiative, it is important to identify, as much as possible, these aspects of culture by means of structured survey and assessment activities. A number of effective tools have been developed for this purpose.

Within the overall culture of an organization, there are often a number of distinct subcultures based on such things as professional discipline, unit functions, geographical
locations, or employee age and experience. If a change initiative is directed primarily to one such unit or sub-group, it is important to understand its unique cultural characteristics.

### 4.4 Organizational culture model

There are different descriptive models that attempt to diagnose organisational culture in the field of organisational development. Harrison (1993) presents a theoretical model for the purpose of diagnosing organisational culture which is adopted in this study.

![Organisational Culture Model by Harrison (1993)](image)

**Figure 4.1: Organisational Culture Model by Harrison (1993)**

Harrison (1993, p 8) states that “though the model is intended to be descriptive rather than evaluative, there is a tendency to perceive it in evaluative terms”. This descriptive model creates an awareness of the culture gap between the existing and preferred cultures in an organisation (Harrison, 1993). Furthermore, this model maintains that organisational culture can be diagnosed in four cultural dimensions, namely power-oriented culture; role-oriented culture; achievement-oriented culture; and support-oriented culture (Harrison, 1993).
The organizational culture model presented in figure 2.1 indicates that the four dimensions of culture orientation are measured within two modes of operation, which are formalisation and centralisation (Harrison, 1993). Both modes of operation can be measured on a scale of low or high levels.

According to Martins and Martins (2003, p 382) “high formalisation in an organisation creates predictability, orderliness and consistency”. In other words, a strong culture can serve as a substitute for formalisation. This suggests that the organisation’s formal rules and regulations which act to regulate its members’ behaviour can be internalised by organisational members when they accept the organisation’s culture; this takes place without the need for written documentation (Martins & Martins, 2003). Therefore, low formalisation of rules and regulations could reflect a weak organisational culture.

**Power culture dimension**

Power-oriented culture is a dimension of the organisational culture model. In any given organisation there is a need to use power in order to exercise control and influence behaviour. Harrison and Stokes (1992, p 14) define power-oriented culture as “organisational culture that is based on inequality of access to resources”. Figure 2.1 of the organisational culture model indicates that a power-oriented culture organisation is characterised by high centralisation and low formalisation modes of operation. Brown (1998, p 66) states that “a power culture has a single source of power from which rays of influence spread throughout the organisation”. This means that power is centralised and organisational members are connected to the centre by functional and specialist strings.

This type of organisational culture can also be regarded as being rule oriented in the sense that it focuses on respect of authority, rationality in procedures, division of work and normalisation (Hampden-Turner, 1990). The centre is formal authority and holds the power to control and influence activities within the organisation.

In this type of organisational culture a dominant head sits in the centre surrounded by intimates and subordinates who are the dependants (Harrison, 1993). In this regard a personal, informal and power management style becomes valued. Normally the organisational structure is a web structure that is hierarchical in nature (Brown, 1998).
web structure implies that the whole structural system connects to the central power while being hierarchical in nature means power is shared from top to bottom.

Power-oriented culture is found in both small and larger organisations. In small organisations run by power-oriented leaders, leadership resides in a few and rests on their ability (Brown, 1998). Those exercising power strive to maintain absolute control over subordinates. In such systems, the size of the organisation is a problem because if the web links to too many activities it can break.

Harrison and Stokes (1992, p 14) indicate that in larger organisation “at its worst power-oriented organisational cultures tends towards a rule by fear, with abuse of power for personal advantage on the part of the leaders, their friends and their protégés”. This would imply that in a larger organisation there is the tendency to instil fear in the employees and to abuse power. This can lead to nepotism and favouritism.

In general, a power-oriented culture organisation often has a top down communication approach (Harrison, 1993). Such an organisation may be politically oriented in the sense that decisions are taken largely on the bases of influence rather than on procedural or purely logical grounds. The management may be threatened by new changes imposed by internal and external environments (Hampden-Turner, 1990).

<table>
<thead>
<tr>
<th>Disadvantages</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>People give the boss's wishes the highest priority, even when it interferes with important work.</td>
<td>Unifies individual effort behind the vision of the leader.</td>
</tr>
<tr>
<td>People are afraid to give bad news to the boss.</td>
<td>Can move quickly in the market and make rapid internal changes.</td>
</tr>
<tr>
<td>People do not question the leaders even when they are seen to be wrong.</td>
<td>Leverages the knowledge, wisdom and talent of the leader.</td>
</tr>
<tr>
<td>People with power break rules with impunity and take special privileges.</td>
<td>Can provide direction and certainty; reduce conflict and confusion in times of emergency.</td>
</tr>
</tbody>
</table>
Information is a source of personal power and is restricted to friends and allies.

People are promoted by being loyal to those in power even when they are not especially competent.

Table 4.1 the disadvantages and advantages of the power-oriented culture dimension.

On the other hand, power-oriented organisations also have a positive side. According to Brown (1998, p 67) “the greatest strength of power cultures is their ability to react quickly, but their success largely depends on the abilities of the person or people at the centre”. In other words, power-oriented organisations are able to exploit opportunities and react quickly to threats or danger.

**Role culture dimension**

In the previous discussion on power-oriented culture, it was demonstrated how power is associated with people in high authority. On the other hand, Harrison and Stokes (1992, p 15) define role-oriented culture as “substituting a system of structures and procedures for the naked power of the leader”. This type of culture focuses mainly on job description and specialisation. In other words, work is controlled by procedures and rules that spell out the job description, which is more important than the person who fills the position (Harrison, 1993).

Brown (1998, p 67) states that “the strength of a role culture lies in its functions or specialities (finance, purchasing, production and so forth) which can be thought of as a series of pillars which are co-ordinated and controlled by a small group of senior executives (the pediment)”. This implies that the foundation and pillars of such an organisation are the formalised and centralised functions; which are controlled by role and communication procedures (Hampden-Turner, 1990). Such an organisation is often stereotyped as bureaucratic because of its mechanistic procedures.

Organisations with this type of culture is characterised by a set of roles or job boxes joined together in a logical fashion (Harrison, 1993). These roles or job descriptions are coordinated at the top by a narrow band of senior management. The common link between
the power-oriented and the role-oriented organisational cultures is that they depend on the use of external rewards and punishments to motivate organisational members.

<table>
<thead>
<tr>
<th>Disadvantages</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>People follow the rules even when these rules get in the way of doing the work.</td>
<td>Well-designed structures and systems</td>
</tr>
<tr>
<td>It is considered a sin to exceed one's authority or deviate from accepted procedures.</td>
<td>Make room for efficient operations and reduce the time for learning jobs.</td>
</tr>
<tr>
<td>It is more important to avoid deviating from the norm that it is to do the right thing.</td>
<td>Clear lines of authority and responsibility reduce conflict, turf battles, confusion and indecision.</td>
</tr>
<tr>
<td>Jobs are so tightly defined that there is little room to contribute one's unique talents and abilities.</td>
<td>Clear, fair rules and guidelines protect individuals from exploitation and abusive use of power.</td>
</tr>
<tr>
<td>People are treated as interchangeable parts of a machine rather than as individuals.</td>
<td>Having good systems, procedures and organisational memory prevents having to &quot;reinvent the wheel&quot;.</td>
</tr>
<tr>
<td></td>
<td>Structure, routine and predictability provide security and reduce stress.</td>
</tr>
</tbody>
</table>

Table 4.2 the disadvantages and advantages of the role-oriented culture dimension.

According to Harrison and Stokes (1992, p15) role-oriented organisations "operate on the assumption that people are not to be trusted, so they do not give individual autonomy or discretion to members at lower levels". This culture results in a hierarchical chain of command which creates stability and predictability. It can offer security for organisational members by offering a predictable rate of climbing up a pillar and a chance to acquire specialist skill without risk (Brown, 1998). In essence, this role culture exists to ensure that organisational members do not make mistakes, while emphasising legality, legitimacy and responsibility.

Role clarification is crucial in an organisation with a role culture. The emphasis of role clarification is based on technical expertise and specialisation more than product innovation or product cost (Harrison, 1993). This presents a limitation to an organisation with a role-oriented culture. Brown (1998, p 67) states that “role cultures are likely to be most successful in stable and predictable environments over which the organisation is able to exert some
control or where product life spans are long”. Therefore, an organisation with this type of culture can find it difficult to survive in an environment that requires the ability to be adaptive and responsive to dynamic changes.

**Achievement culture dimension**

Harrison and Stokes (1992, p 17) define achievement-oriented culture as “the aligned culture which lines people up behind a common vision or purpose”. Achievement culture is often referred to as task culture, which entails that organisational members focus on realising the set purpose and goals of the organisation. Brown (1998, p 67) states that “a task culture is one in which power is somewhat diffuse, being based on expertise rather that position or charisma”. Figure 2.1 illustrates that achievement-oriented culture’s mode of operation is high in formalisation and low in centralisation. This implies that there is a natural balance between formality and centrality of power, which is shared within the organisations.

The organisational structure is like a net, with some of the strands of the net thicker and stronger than others (Harrison, 1993). Power is allocated based on short-term horizon, such as projects classifications. The completion of a task is important as team work rather than the promotion of individual positions or work (Hampden-Turner, 1990). Unlike role-oriented culture, where positional or personal power plays an important role, skills, competencies and expert power form the core of achievement-oriented culture. Therefore, authority is based on appropriate knowledge and competence.

The main strategic objective of this culture is to bring the right people together, in order to achieve the organisational goals (Brown, 1998). This suggests that the achievement-oriented culture is similar to team orientation as a characteristic of organisational culture. Martins and Martins (2003, p 381) describe team orientation as “the degree to which work activities are organised around teams rather than the individuals”. By bringing together a spectrum of people who are specialists in their fields; the organisation is able to meet its market demand.

According to Brown (1998, p 69) the strength of achievement culture is that “in those environments where the market is competitive, product life spans are short and constant innovation is a necessity; this culture can be highly successful”. This is due to functions and
activities that are team structured and evaluated in terms of their contribution to organisational goals.

Teams of talented people and resources are brought together to focus only on specific projects or tasks. Stander (2003, p 199) states that the advantage of team, rather than individual, jobs is “creating the high-performance, high-flexibility, and high-commitment organisation”. This is due to the fact that teams generate positive synergy through coordinated efforts. While using teams is an advantage, the main weakness of the achievement culture in this regard is that it overshadows individual performance.

<table>
<thead>
<tr>
<th>Disadvantages</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>People believe so much in what they are doing that the end comes to justify the means.</td>
<td>Unity of effort toward mutually valued goals.</td>
</tr>
<tr>
<td>People become intolerant of personal needs, and they sacrifice family, social life and health for work.</td>
<td>Reduced need for controls on individuals.</td>
</tr>
<tr>
<td>The group members talk only to themselves and become isolated from others and from reality.</td>
<td>Maximum utilization of members’ talents.</td>
</tr>
<tr>
<td>The group only cooperates internally, which others see as arrogant and competitive.</td>
<td>High internal motivation.</td>
</tr>
<tr>
<td>Because dissent and criticism are stifled, the group has difficulty correcting its own errors.</td>
<td>High self-esteem for organisational members.</td>
</tr>
<tr>
<td>The commitment to excellence at any cost leads to waste and inefficiency.</td>
<td>Rapid learning, problem solving and adaptation to change</td>
</tr>
</tbody>
</table>

Table 4.3 the disadvantages and advantages of the achievement culture dimension
Support culture dimension

Support-oriented culture dimension differ from the achievement-oriented culture which emphasises teams, because promotes individuals as the central point in the organisation. Harrison and Stokes (1992, p 20) define support-oriented culture as an “organisational climate that is based on mutual trust between the individual and the organisation”. Thus, support-oriented organisational culture is often referred to as a person-oriented culture.

Brown (1998, p 69) states that a support-oriented organisation “exists solely for the individuals who compromise it, and may be represented diagrammatically as a cluster in which no individual dominates”. Figure 2.1 depicts the mode of operation of this culture as being low in formalisation and centralisation.

The organisational structure is a benevolent cluster structure with minimal hierarchy, which implies less power control of employees (Harrison, 1993). Authority is assigned on the basis of task competence; this is similar to the role-oriented culture organisation. Power sharing and the influence of power can only be exercised where there is a need for expert or task competence (Brown, 1998). As a result individuals influence each other through example and helpfulness.

The support-oriented culture resembles the people orientation characteristic of organisational culture. Martins and Martins (2003, p 381) describe people orientation culture as “the degree which management decisions take into consideration the effect of outcomes on people”. This implies that the wellbeing of employees is important to managers in this type of organisation.

These organisations are normally small in size and people have worked together for a long time and have managed to build up personal relationships (Harrison, 1993). The relationships are characterised by mutuality and trust which binds people to one another. Therefore, the relationship exists to serve the needs of the members. In this type of culture there is minimum formal and central power that replaces management control with consensus decision making (Harrison & Stokes, 1992). Communication is often verbal or
informal, and usually flows in all directions. Subsequently, decision-making occurs through informal communication networks.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>People may focus on relationships and neglect the work.</td>
<td>Good internal communication and integration.</td>
</tr>
<tr>
<td>Out of kindness difficult personnel decisions may be avoided.</td>
<td>High levels of commitment to decision.</td>
</tr>
<tr>
<td>When consensus cannot be reached the group may become indecisive.</td>
<td>Sophisticated process skills manage people issues well.</td>
</tr>
<tr>
<td>Disagreement may be avoided, there is surface harmony and covert conflict</td>
<td>High levels of cooperative, effective group work and trust.</td>
</tr>
<tr>
<td>Changes may take a long time because of the need to get everyone on board</td>
<td>Good at sensing environment and balance for achievement culture.</td>
</tr>
<tr>
<td>People are rewarded in the same way although they might not have contributed in the same way. This could create frustrations.</td>
<td>Providing caring, responsive service.</td>
</tr>
<tr>
<td></td>
<td>Nurturing members for good health.</td>
</tr>
</tbody>
</table>

Table 4.4 the disadvantages and advantages of support-oriented culture dimension

The above-mentioned disadvantages and advantages of support-oriented culture dimension reflect the positive and negative effects of this type of culture in an organisation.

According to Brown (1998, p 69) “in the person culture the individuals themselves decide on their own work allocation, with rules and co-coordinative mechanisms of minimal significance”. In other words, work roles are assigned on the basis of personal preference normally based on the need for learning and development. Support-oriented culture creates a conducive workplace environment that encourages proactive, experimentation and openness to change (Harrison, 1993). This suggests that the organisation values the talents of individual employees who also value their own work. Thus the organisation sees its role as resourcing talented individuals and the latter are allowed to make decisions.
4.5 Functions of Organizational culture

The main function of organisational culture is to define the way of doing things in order to give meaning to organisational life (Arnold, 2005). Making meaning is an issue of organisational culture, because organisational members need to benefit from the lessons of previous members. As a result, organisational members are able to profit from whatever trials and errors regarding knowledge others have been able to accumulate (Johnson, 1990).

Organisational culture also determines organisational behaviour, by identifying principal goals; work methods; how members should interact and address each other; and how to conduct personal relationships (Harrison, 1993).

Brown (1998, p 89-91) states the following functions of organisational culture:

- Conflict reduction. A common culture promotes consistency of perception, problem definition, evaluation of issues and opinions, and preferences for action.
- Coordination and control. Largely because culture promotes consistency of outlook it also facilitates organisational processes of co-ordination and control.
- Reduction of uncertainty. Adopting of the cultural mind frame is an anxiety reducing device which simplifies the world of work, makes choices easier and rational action seem possible.
- Motivation. An appropriate and cohesive culture can offer employees a focus of identification and loyalty, foster beliefs and values that encourage employees to perform.
- Competitive advantage. Strong culture improves the organisation’s chances of being successful in the marketplace.

In addition to the above functions, Martins and Martins (2003, p 382) also mention the following as functions of organisational culture:

- It has a boundary-defining role, that is, it creates distinctions between one organisation and the other organisations.
- It conveys a sense of identity to organisational members.
- It facilitates commitment to something larger than individual self-interests.
 It enhances social system stability as the social glue that helps to bind the organisation by providing appropriate standards for what employees should say and do.
 It serves as a meaningful control mechanism that guides or shapes the attitudes and behaviours of employees.

These functions of organisational culture suggest that an organisation cannot operate without a culture, because it assists the organisation to achieve its goals. In general terms, organisational culture gives organisational members direction towards achieving organisational goals (Hampden-Turner, 1990).

4.6 Strong and weak organizational cultures

Organisational culture can be either weak or strong. Martins and Martins (2003, p 382) highlight that “in a strong culture, the organisation’s core values are held strongly and shared widely”. This suggests that when organisational members accept the shared values, they become more committed to them. A strong organisational culture therefore refers to organisations in which beliefs and values are shared relatively consistently throughout an organisation (Deal & Kennedy, 1982).

Strong organisational cultures have a great influence on the behaviour of organisational members (Martins & Martins, 2003). In other words, a strong culture is a powerful lever for guiding behaviour (Deal & Kennedy, 1982).

Brown (1998, p 226) also believes that strong organisational culture can enable an organisation to achieve high performance based on the following reasons:

 A strong organisational culture facilitates goal alignment.
 A strong organisational culture leads to high levels of employee motivation.
 A strong organisational culture is better able to learn from its past.

In relation to the above benefits of a strong organisational culture, Martins and Martins (2003, p 382) states that “one specific result of a strong culture should be a lower employee turnover”. This is due to the fact that when organisational members agree about what the organisation stands for, the end results are cohesiveness, loyalty and organisational commitment (Martins & Martins, 2003).
A weak culture, on the other hand, means the opposite of a strong culture, in other words, organisational members do not subscribe to the shared beliefs, values and norms (O’Reilly et al, 1991). Organisational members in a weak culture find it difficult to identify with the organisation’s core values and goals (Wilson, 1992). As a result components or different departments within such an organisation uphold different beliefs that do not necessarily address the core goals of the organisation.

Weak cultures have a negative impact on employees because they are directly linked to increased turnover (Harrison, 1993). In essence, the fundamental strength of the organisation’s culture is determined by how weak or strong it is.

**4.7 Creating and sustaining Organizational culture**

The following discussion focus on how an organisation is able to create and sustain its culture.

**Creating organisational culture:**

The main source of organisational culture is the organisation’s leadership. Leadership in this context refers to the influential individuals, often the founders who have a major impact on the creation of the organisation’s early culture (Schein, 1985). According to Brown (1998, p 48) “in building their organisations founders tend to impose their beliefs and values about the nature of the world, organisations and human nature on other organisational participants”. This suggests that the founders of the organisation, created the organisational culture.

Martins and Martins (2003, p 385) indicate that the founders of an organisation follow the following ways in their process of culture-creation:

- Firstly, founders only appoint and keep employees who think and feel the way they do.
- Secondly, they indoctrinate and socialise these individuals to their way of thinking.
- Finally, the founders’ own behaviour act as role model that encourages employees to identify with them, thereby internalising their beliefs, values and assumptions.
Organisational culture is therefore, not created accidentally or spontaneously but through founders who have specific values and beliefs in their endeavour to realise their vision and goals.

**Sustaining organisational culture:**

In order to keep the organisational culture alive, the organisation has to ensure that its culture is transmitted to organisational members (Martins & Martins, 2003). Brown (1998, p 55 – 59) presents the following three basic stages in which organisational culture can be sustained in the organisation:

**Pre-selection**

The first stage of sustaining organisational culture is the pre-selection stage. The pre-selection stage is characterised by potential recruits who aspire to become members of an organisation, who may make great efforts to learn about its history and culture (Brown, 1998). The selection process is also used by the organisation to appoint individuals who will fit into the organisation’s culture; the values of such individuals should be consistent with those of the organisation (Martins & Martins, 2003).

**Socialisation**

The socialisation stage follows the pre-selection stage of sustaining organisational culture. According to Brown (1998, p 57) this stage can be described as the “enculturation process by which participants learn the culturally accepted beliefs, values and behaviours, so that they are able to act as effective members of the group”. This suggests that during the socialisation stage, the organisation helps new organisational members to adapt to its culture (Martins & Martins, 2003).

Martins and Martins (2003, p 388) conceptualise the socialisation process as consisting of the following three stages:

- The pre-arrival stage encompasses all the learning that occurs before a new employee joins the organisation.
- The encounter stage is when the new member sees what the organisation is really like and confronts the possibility that expectations and reality may diverge.
The metamorphosis stage is when long-term changes take place and the new members must work out any problems discovered during the encounter stage.

**Incorporation/Rejection**

The incorporation or rejection stage is the final stage of sustaining organisational culture. It is through the socialisation process that organisational members may be incorporated or rejected (Brown, 1998). Indicators that the individual member has reached full incorporation includes acceptance by the work group, understanding and acceptance of the organisation’s culture (Martins & Martins, 2003). On the other hand rejection may lead to loss of key goals, values and assumptions; which ultimately create a crisis of identity for organisational members (Schein, 1985).

### 4.8 Methods of learning organizational culture

Organisational members in a number of ways and methods can learn organisational culture. According to Brown (1998, p 10 – 30) the following ways have been identified to be methods of learning the organisation’s culture:

- **Artefacts.** They refer to the total physical and socially constructed environment of an organisation. Examples of artefacts include office space, equipments, rules, systems and procedures.
- **Language.** It refers to the fundamental way in which the organisation comprehends its world. Examples of language include jokes, metaphors, stories, myths and legends.
- **Behaviour patterns.** They refer to recurrent patterns of behaviour which are a feature of organisational life. These patterns include rites, rituals, ceremonies and celebrations.
- **Norms of Behaviour.** They refer to rules for behaviour which dictate what are considered to be appropriate and inappropriate responses from employees in certain circumstances. Such norms develop over time as individuals negotiate with each other in their attempts to reach a consensus on how to deal with organisational issues.
- **Heroes.** They make success possible, provide role models and portray the organisation to external constituencies. Heroes are the people who motivate other employees.
- Symbols and symbolic action. These include words, objects, conditions, acts or characteristics of the organisation, which mean something to organisational members. Typical symbols found in organisations include corporate logos, policies and products.

- Believes, values and attitudes. Values are intimately connected with moral and ethical codes; they determine what people think ought to be done. Beliefs on the other hand, refer to what people think is and is not true. Attitudes connect belief and values with feelings; they may be thought of as a learned predisposition to respond consistently in a favourable and unfavourable manner.

- Basic assumptions. They are taken-for-granted solution to an identifiable problem. Basic assumptions guide organisational members’ perception, feelings and emotions about things in the organisation.

- History. Culture is understood to be a product of the historical process.

The different ways described above, can be used to transmit organisational culture during the process of sustaining it.
5. **Total Quality management (TQM)**

5.1 The concept of quality

Quality is a significant element of production or services in keeping the customers satisfied. There are different definitions and competing views of the term quality by different people and the common element of the business definitions is that the quality of a product or service refers to the perception of the degree to which the product or service meets the customer's expectations. Crosby, (1979) defined quality as the conformance to requirements or specifications and also suggested that to manage quality adequately; it must be able to be measured. ISO 9000: (2000) (cited in Vorley and Tickle, 2001) defined quality as the degree to which a set of inherent characteristics fulfil requirements.

The American Society of Quality sees quality as being subjective, with different individuals having their own perception of it (www.asq.org, assessed 29/10/08). To them, quality can be seen as having two meanings – the characteristics of the product or service ability to satisfy a particular need or a product or service devoid of faults. It can be defined as a state of conformance to valid requirements where valid requirement are defined as conditions that meets the needs of customers, measurable and achievable. Peters, (1999) defined quality as a ‘magic bullet’ which provides lower cost, higher customer service, better products and higher margins. He also explained that ‘quality is in the eyes of the beholder’, this mean it is what the customer say it is.

Kondo, (1997), defined quality as a source of employee’s empowerment. To him, a major aim of a company is to make itself attractive to its employees and customers while making profits for its shareholders.

George Bernard cited in Stebbing, (1992) noted that two forms of qualities exist in the world, efficiency and inefficiency. To him, efficiency is what every senior manager should strive to achieve and the efficiency in service is what the customers expect to get. He explained that organisations are inefficient because of the inadequate trainings given to employees by the employers or the assignment of task to unqualified workers. Whichever way quality is defined, it is viewed as part of an organisational culture; this should be inclusive of all different facets of production.
5.1.1 Quality Management

Quality management involves the formulation of strategies, setting goals and objectives, planning and implementing the plans; and using control systems for monitoring feedback and taking corrective actions. An organisation’s quality management implementations are of two folds-

a) Satisfying customer’s expectation and

b) Improvement in the overall business efficiency (Dale, et al (a) 1994)

According to Juran (1988), the basic goal of quality management is the elimination of failure; both in the concept and in the reality of products, services and processes. This does not only mean that product, services and processes will fail in fulfilling their function but that their function was not what the customer desire. Failure must be prevented in quality management and to handle this there should be planning, organizing and controlling. Four stages of quality management was treated by Dale et al (1994), this include inspection, quality control (QC), quality assurance (QA) and total quality management (TQM).

5.1.2 Inspection

According to (ISO 8402, 1986) inspection can be defined as ‘activities such as measuring, examining, testing, gauging one or more characteristics of a product or service and comparing these with specified requirements to determine conformity’. It involves the examination, measurement and testing of the characteristics of a product or service and the comparison to specified requirement and to access if the characteristics conform to specified requirement (Dale et al. (b) 1994). Inspection is an efficient and effective way of discovering defects in services and products. According to Deming (1986), ‘inspection with the aim of finding bad product and throwing them out is too late, ineffective and costly’. Quality to him comes from the improvement in the process rather than inspection.

5.1.3 Quality Control

Quality control is a conventional way that businesses have used to manage quality. Quality control is concerned with checking and reviewing work that has been done. This is mainly done by inspection of products and services (checking to make sure that what’s being
produced is meeting the required standard) take place during and at the end of the operations process. Juran (1988) defined quality control as the regulatory process through which we measure that actual quality performance, compare it with standards, and act on the difference. It is a more sophisticated management tool aims at preventing goods and services which do not conform to basic requirements from getting to the final consumer. Quality controls are operational techniques and activities that are used to fulfil quality requirement (ISO 8402, 1994). As a measure of quality, quality control however is costly when viewed in terms of tangible and intangible variable cost. It could also result in the production of substandard goods and services when conducted late in the process of production. Due to the problems associated with quality control, businesses now focus on other avenues or means through which quality could be managed effectively. Dale, Boaden and Lascelles (1994), noted that the solving of a problem after a non-conformance issue has been created is not an effective route towards eliminating the root cause of a problem.

5.1.4 Quality Assurance

This is a principle based on the designing of the business process of production with a view of minimising the chances of producing substandard goods. According to Dale et al, (a) 1994), quality assurance is a prevention based system, which improves product and service quality with increased productivity by placing the emphasis on product, service and process design. Quality assurance emphasis on defect prevention, unlike quality control that focuses on defect detection once the item is produced.

Quality assurance is focused on the prevention of the production of non-conforming product and much emphasis is placed on the activities involved in the process of production. Thus, it is a management design aimed at controlling quality at all stages of production to prevent quality problems from emerging.

The quality assurance philosophy opined that quality is created in the design stage and not the control stage and that problems associated with quality are caused by poor process design. According to Lockwood et al, (1996), ‘to be effective, quality assurance must involve the development of a new operating philosophy and approach that looks to be proactive rather than reactive, that includes motivating and involving people in the process across normal departmental barriers'.
5.1.5 Total Quality Management

This is the highest level of quality management. It is concerned with the management of quality principle in all the facets of a business including customers and suppliers (Dale et al, 1994, Lockwood et al, 1996). Total Quality Management (TQM) involves the application of quality management principles to all aspects of the organization, including customers and suppliers, and their integration with everyone in the organization. TQM is a principle which involves the mutual cooperation of everyone that aids the business process of an organisation and it involves all the stake holders of an organisation. Dale et al, ((a) 1994) cites BS.4778; part 2(1991) where key business processes. It is an approach which involves continuous improvement by

‘TQM is defined as a philosophy embracing all activities through which the needs and expectations of the customer and the community, and the objectives of the organisation are satisfied in most efficient and cost effective way by maximising the potentials of all employees in a continuing drive for improvement.’

According to Mohammed (2006), TQM is an effective system for integrating the quality development, quality maintenance and quality improvement efforts of various aspects of a system so as to enable services at most economical level and derive full satisfaction. TQM is aimed at the satisfaction of customers’ needs in an efficient, reliable and profitable way. It involves a radical direction through which an organisation perform her day to day operations in other to ensure that quality is put at the top of mind of every employee and departments in which they operate. Vorley and Tickle (2001), defined TQM as the synthesis of the organisational, technical and cultural elements of a company. They opined that TQM is a heart and mind philosophy which recognises that company culture affects behaviour which in turn affects quality.

Oakland (1989), describes TQM as an approach to improve competitiveness efficiently and flexibility for the whole organisation. According to Hellsten and Klefsjö (2000), TQM can be defined as a management system which consist of interdependent unit namely core values, techniques such as process management, benchmarking customer focused planning or improvement teams and tools such as control charts. Dahlgaard, Kristensen and Kanji (1999) saw TQM as a corporate culture that is characterised by increased customer
satisfaction through continuous improvement involving all employees in the organisation. Oakland (1989), noted that ‘for an organisation to be truly effective each part of it must work properly together towards the same goal, recognising that each person and each activity affects and in turn is affected by each other – the methods and techniques used in TQM can be applied throughout any organisation.’

| TOTAL QUALITY MANAGEMENT | Policy deployment  
| | Involves suppliers and customers  
| | Involve all operations  
| | Process management  
| | Performance measurement  
| | Team work  
| | Employee involvement  
| QUALITY ASSURANCE | Quality system development  
| | Advanced quality planning  
| | Comprehensive quality manuals  
| | Use of quality costs  
| | Involvement of non-production operation  
| | Failure mode and effect analysis  
| QUALITY CONTROL | Develop quality manuals  
| | Process performance data  
| | Self-inspection  
| | Product testing  
| | Basic quality planning  
| | Use of basic statistics  
| | Paper work control  
| INSPECTION | Salvage  
| | Sorting, grading and re-blending  
| | Corrective actions  
| | Identify sources of non-conformance  

Table 5.1 the stages of Quality management and Characteristics
5.2 The evolution of TQM

<table>
<thead>
<tr>
<th>TIME:</th>
<th>Early 1900s</th>
<th>1940s</th>
<th>1960s</th>
<th>1980s and Beyond</th>
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<tbody>
<tr>
<td>FOCUS:</td>
<td>Inspection</td>
<td>Statistical sampling</td>
<td>Organizational quality focus</td>
<td>Customer driven quality</td>
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Figure 5.1 Timeline showing the differences between old and new concepts of quality

The concept of quality has existed for many years, though it’s meaning has changed and evolved over time. In the early twentieth century, quality management meant inspecting products to ensure that they met specifications. In the 1940s, during World War II, quality became more statistical in nature. Statistical sampling techniques were used to evaluate quality, and quality control charts were used to monitor the production process. In the 1960s, with the help of so-called “quality gurus,” the concept took on a broader meaning. Quality began to be viewed as something that encompassed the entire organization, not only the production process. Since all functions were responsible for product quality and all shared the costs of poor quality, quality was seen as a concept that affected the entire organization.

The meaning of quality for businesses changed dramatically in the late 1970s. Before then quality was still viewed as something that needed to be inspected and corrected. However, in the 1970s and 1980s many U.S. industries lost market share to foreign competition. In the auto industry, manufacturers such as Toyota and Honda became major players. In the consumer goods market, companies such as Toshiba and Sony led the way. These foreign competitors were producing lower-priced products with considerably higher quality.

To survive, companies had to make major changes in their quality programs. Many hired consultants and instituted quality training programs for their employees. A new concept of quality was emerging. One result is that quality began to have a strategic meaning. Today,
successful companies understand that quality provides a competitive advantage. They put the customer first and define quality as meeting or exceeding customer expectations.

Since the 1970s, competition based on quality has grown in importance and has generated tremendous interest, concern, and enthusiasm. Companies in every line of business are focusing on improving quality in order to be more competitive. In many industries quality excellence has become a standard for doing business. Companies that do not meet this standard simply will not survive. As you will see later in the chapter, the importance of quality is demonstrated by national quality awards and quality certifications that are coveted by businesses.

The term used for today’s new concept of quality is total quality management or TQM. Figure 5-3 presents a timeline of the old and new concepts of quality. You can see that the old concept is reactive, designed to correct quality problems after they occur. The new concept is proactive, designed to build quality into the product and process design. Next, we look at the individuals who have shaped our understanding of quality.

5.3 The building blocks of TQM:

Processes, people, management systems and performance measurement.

Everything we do is a Process, which is the transformation of a set of inputs, which can include action, methods and operations, into the desired outputs, which satisfy the customers’ needs and expectations. In each area or function within an organisation there will be many processes taking place, and each can be analysed by an examination of the inputs and outputs to determine the action necessary to improve quality.

In every organisation there are some very large processes, which are groups of smaller processes, called key or core business processes. These must be carried out well if an organisation is to achieve its mission and objectives. The section on Processes discusses processes and how to improve them, and Implementation covers how to prioritise and select the right process for improvement.
The only point at which true responsibility for performance and quality can lie is with the People who actually do the job or carry out the process, each of which has one or several suppliers and customers.

![Figure 5.2: the building blocks of TQM](image)

An efficient and effective way to tackle process or quality improvement is through teamwork. However, people will not engage in improvement activities without commitment and recognition from the organisation’s leaders, a climate for improvement and a strategy that is implemented thoughtfully and effectively. The section on people expands on these issues, covering roles within teams, team selection and development and models for successful teamwork.

An appropriate documented Quality Management System will help an organisation not only achieve the objectives set out in its policy and strategy, but also, and equally importantly, sustain and build upon them. It is imperative that the leaders take responsibility for the adoption and documentation of an appropriate management system in their
organisation if they are serious about the quality journey. The Systems section discusses the benefits of having such a system, how to set one up and successfully implement it.

Once the strategic direction for the organisation’s quality journey has been set, it needs performance measures to monitor and control the journey, and to ensure the desired level of performance is being achieved and sustained. They can, and should be, established at all levels in the organisation, ideally being cascaded down and most effectively undertaken as team activities and this is discussed in the section on performance.

5.4 Stages of TQM implementation

Dale et al, ((b) 1994) identified six different levels of TQM implementation, these includes uncommitted, drifters, tool pushers, improvers’ award winners and world class. According to them, these stages do not necessarily represent the stages through which organisations pass on their TQM journey. These levels according to Dale et al are to help organisation in identifying their weaknesses and proffering solutions to them through the use of continuous improvement.

- Uncommitted: This stage represents organisations that have not started a formal procedure of quality improvement. Organisations in this stage view quality improvement as an added cost and thus have no investment in quality improvement programmes such as training of employees. Organisations in this stage are termed uncommitted because they are not aware of the benefit of quality improvement and lack an appropriate quality improvement plan (Dale et al, (b) 1994). The management of these organisations are characterised by an emphasis on return of sales and net asset employed.

Other common features of this level as highlighted by Dale et al ((b) 1994), this include

- A major concern for meeting sales target.
- Employees show little or no concern for quality.
- Full inspection of materials is carried on incoming material and at strategic points during the process of production.
• Lack of communication among the various units of production even between the top management and front line employees.

• Minimal contact with customers.

❖ Drifters: These are organisations that have engaged in a process of quality improvement for up to three years and have followed the available advice and wisdom of TQM. The management of the organisations in this stage tend to review the performance of the firm based on the implementation of TQM and expect immediate gains from it. These organisations view TQM as a programme rather than a process thus making the policy have a low profile among employees. Dale et al (b) 1994) noted that organisations with such an approach to management are termed drifter because they drift from one programme to the other in a start stop fashion with concepts, ideas and initiative being reborn and re-launched under different guises. Organisations which fall within this stage usually have no plan for the deployment of TQM philosophy throughout the organisation thus limiting the implementation of TQM to the managers while leaving the shop floor out of the implementation process.

❖ Tool pushers: Organisations in this category look at quality improvement programs but in most cases fail to use such tools appropriately. They adopt quality management tools such as quality cycles, quality improvement groups. These organisations often blame the failure of TQM on the tools adopted. Dale et al (b) 1994,) explained that organisations in this stage find it difficult to sustain the momentum of its improvement initiatives and it is continually on the lookout for new ideas. Some characteristics of the drifters includes –

• A major concern for meeting sales target.
• Solving current problems rather than future problems
• Non commitment of every senior management to TQM
• TQM does not operate in every facet of the organisation.

Companies under this category are more experienced in quality improvement when compared with the drifters.

❖ Improvers: Organisations in this category have engaged in a process of quality improvement for between five and eight years and during this time made important
advances (Dale et al, (b) 1994). They understand that total quality involves long term cultural change and have recognised the importance of cultural change and the importance of quality improvement. Dale et al, ((b) 1994) explained that organisations in this category are termed improvers because they are moving in the right direction and have made significant progress but still have a long way to go. This is because the implementation of TQM is dependent on a few managers to sustain the drive and direction of the improvement strategy.

❖ **Award Winners:** These organisations are termed award winners because they have attained a point in their TQM maturity where the kind of culture, values and trust capabilities relationship and employee involvement has become total in nature and encompasses the whole organisation (Dale et al (b) 1994). In these type of organisation every member of staff recognises the importance of quality and all effort is made to maintain a quality standard. True competition based on product or service quality can only be attained when an organisation has gotten to a stage where it can compete for awards (Dale et al 1994 cited (p124) William and Bech, 1989). Organisations in this stage are believed to have manned the process of quality improvement as the organisations have all it takes to achieve greater heights.

❖ **World class:** According to Dale et al, ((b) 1994) these organisations are characterised by the total quality improvement and business strategies to the delight of customers. The organisations that have attained this stage are always in search of opportunities to improve their services to satisfy customers. It was further explained that the focus of TQM here is on enhancing competitiveness by influencing the perception of customers to the company through the continuous innovation of the service offering. The impact of TQM is felt more here as it is aimed at continuous improvement to enhance customer appeal. The task of satisfying customers is a goal for everyone in the organisation.
5.5 Major principles of TQM

Before an organisation can rip the benefit from TQM implementation, some principle would have to be enshrined into the organisation’s culture. This section of the literature reviews these principles in relation to TQM implementation. The principles are discussed below:

Top management commitment and leadership

TQM requires effective change in organisational culture and this can only be made possible with the deep involvement/commitment of management to the organisation’s strategy of continuous improvement, open communication and cooperation throughout the organisation. TQM implementation improves the organisational performance by influencing other TQM dimensions (Kaynak, 2003). According to Oakland (1993), ‘to be successful in promoting business efficiency and effectiveness, TQM must start at the top with the chief executive’. Cooper and Ellram (1993), identified leadership as being critical in effecting organisational change most especially in the areas of building effecting relationship with suppliers and others involved in the process of value delivery. The commitment of leadership to the TQM strategy as shown in their daily disposition to work will go a long way in motivating employees to deliver quality services that exceeds the expectation of customers.

Andrle (1994), noted that ‘the implementation of TQM requires a clear long term leadership commitment’. To him, long term relationship with satisfied customers is an asset to the organisation, thus, management must be committed to it. Andrle also stressed the importance of management in providing a ‘customer focused support system’ such as measurements, rewards and recognition for satisfying customers with the aim of building a positive relationship with customers.

Cultural change

According to Oakland, (1989), 'TQM is a way of managing the whole business process to ensure complete customer satisfaction at every stage, both internally and externally. Cultural change to Dale et al, (a 1994) implies an approach to changing the cooperate culture of an organisation to be customer centric. The need for cultural change is stressed by the role it plays in the life of an organisation. According to Dale et al, (1994), ‘culture influences what
the executive groups attend to, how it interprets information and the response it makes to changes in the external environments’ it is exceedingly crucial in the drawing up of the strategic position of the firm as it dictates how members of staff approach their day to day activities. Culture is said to help an organisation in planning and implementing their strategy.

Dale, et al ((a) 1994), defined quality culture as ‘the culture which nurtures high social relationship, and respects for individual, a sense of membership or the organisation and a belief that continuous improvement is for common good’. The total quality culture implies the decentralisation of responsibility to the lowest cadre. By so doing, it taps into the intellectual capability of every individual in the organisation in the process of continuous quality improvement. This makes quality central to every employee and management in the organisation. TQM emphasises the need for change from the traditional approach of quality management which is bureaucratic in nature and which gives little or no room for innovation. The process of change is however difficult as most organisations find it very difficult abandoning their traditional approaches (Dale et al, (a) 1994). The nature of change to take place makes it more difficult as it involves change in people’s attitude.

**Customer focus**

TQM is an ideology which is focused on the satisfaction of customer’s need. Thus, most organisations try as much as possible to meet or exceed customer’s expectation in their daily activity and also their long term plan (Andrle, 1994). TQM require organisations to develop a customer focused operational processes and at the same time committing the resources that position customers and meeting their expectation as an asset to the financial well-being of the organisation. Filippini and Forza (1998) explained that it is necessary for organisation to maintain a close link with their customers in order to know their requirements and to measure how it has been successful in meeting up to customers’ requirements. According to Muffatto and Panizzolo (1995), a high level of customer satisfaction is obtained solely by providing services or products whose features will satisfy customer’s requirements or needs. The customer’s needs and expectation serve to drive development of new service offering. This is due to the fact that customers determine the quality level of service delivered (Jablonski, 1992)
Oakland (1993), noted that organisations are made up of a series of internal suppliers and customers. To him, this forms the quality chain of the company and it implies that every employee is a potential customer and supplier in the course of production. The process of production is structured in a way where each process have needs and expectation which must be fulfilled by others in the network of production. The effective fulfilment of these needs leads to the production of quality goods and services.

**Total involvement**

In the traditional sense, employee involvement was conceived to mean a ‘feeling of psychological ownership among organisational members’ (Harvey and Brown, 1996). Unlike what obtains in the TQM ideology, the traditional employee involvement is narrow-minded; it is job-centred rather than process-centred. The TQM approach involves ‘achieving broad employee interest, participation and contribution in the process of quality management’ (Dale and Cooper, 1993). The concept assumes a companywide quality culture, which gives autonomy or a level of freedom to employees in taking decisions that affect their job. Thus, employees are encouraged to perform function such as information processing, problem solving and decision making (Dimitriades, 2000). This is supported by Omachonu and Ross (1994), who noted that intrinsic motivation is at the heart of TQM, where empowerment and involvement in decision making is viewed as essential for sustained result.

The main aim for the total involvement of employee is to boost internal and external customer’s satisfaction by developing a flexible environment which allows for innovation.

**Continuous improvement**

Continuous improvement means ‘a commitment to constant examination of the technical and administrative process in search of better methods’ (Fuentes-Fuentes et al, 2004). Turney and Anderson (1989) defined continuous improvement as the relentless pursuit of improvement in the delivery of value to customers. This was supported by Dean and Bowen (1994), who argued that customer satisfaction can be attained only through the relentless improvement of processes that create product or service.

Total quality management involves the design into the process of production, a system of continuous improvement. This contains regular cycles of planning, execution and
evaluation (Muffatto and Panizzolo, 1995). According to Oakland (1993), ‘the focus on continuous improvement will lead to the formation of formidable team whose membership is determined by their work on the detailed knowledge of the process, and their ability to take improvement action’. TQM is concerned with the continuous improvement in all the process of production, from the levels of planning and decision making to the execution of work by the front line staff. The principle behind the idea of continuous improvement is basically the idea that mistakes can be avoided and defects can be prevented. According to Stahl (1995), “continuous improvement refers to the constant refinement and improvement of products, services and organisational system to yield improved value to customers”. He further explained that the continuous look for ways in improving quality of product or service in the absence of customers’ complain may prevent a future problem. The continuous improvement process aims to identify and eliminate the cause of a mistake in order to prevent its reoccurrence. Fuentes-Fuentes et al, (2004) explained that organisations operating in a dynamic environment are liable to carry up continuous improvement in its operation; they explained that the face of competition changes faster in this environment as a result of the changes in customers’ needs, competitors’ activities and service/product innovation.

**Training**

Training helps in preparing employees towards managing the TQM ideology in the process of production. Training equips people with the necessary skills and techniques of quality improvement. It is argued to be a powerful building block of business in the achievement of its aims and objectives (Stahl, 1995). Through training, employees are able to identify improvement opportunities as it is directed at providing necessary skills and knowledge for all employees to be able to contribute to ongoing quality improvement process of production. Stahl (1995) argued that training and development programme should not be seen as a onetime event but a lifelong process.

**Team work**

A well-structured team will aid the effective production of goods and services through the integration of activities involved in the process of production. Dale et al (1994) noted that team work is a key feature of involvement. To him, team work aids the commitment of the workforce to the organisational goals and objectives.
The researchers believe it is essential to have a team made of people with right attitudinal disposition to working in groups so as to realise the gains of quality management. Team work is way of stimulating positive work attitude, which includes loyalty to the organisation and a focus on organisational goals. Martinez et al, (1999) noted that teamwork contributes to the generation of improvements that are proposed by employees. To them, the proposed improvements have a way of changing the attitudes of employees that are resistance to change.

Some of the benefits of Team work as highlighted by Oakland (1995), are listed below

• Recommendations made by teams are more likely to be accepted and implemented where the team is highly formidable, unlike the individual suggestion which represents just an individual’s opinion.

• A greater variety of complex problem will be tackled i.e. problems beyond the capability of an individual or department can be handled more efficiently through the pooling of resources together.

• Working in teams exposes a problem to a great variety of knowledge thus problems beyond functional departments can be solved more easily.

• Team work will boost workers morale and ownership through participation in problem solving and decision making.
5.6 Benefits of TQM implementation

The effective implementation of TQM will increase customer satisfaction with the service offerings (Omachonu and Ross). Quality enhances customer loyalty through satisfaction; this in turn can generate repeat business and lead to the attraction of new customers through positive word of mouth. The word of mouth communication will help in cost reduction. This will provide competitive edge to the company.

![Figure 5.3 relationship between the improvement in quality with market share and profitability](image)

Figure 5.3 relationship between the improvement in quality with market share and profitability
Total quality management is a management philosophy which emphasises the devolution of authority to the front line staff. It ensures the participation of every one in the decision making process through activities such as quality cycles and team work. The question is, does this devolution of authority leads to employees’ satisfaction or not? Motivations theories indicate that two major forms of motivation exist – the intrinsic and the extrinsic motivation. While some will argue that the best form of motivation is monetary incentive, others argue for self fulfilment and recognition.

The motive behind the intrinsic reward is to provide the employee with some autonomy which empowers him to take decisions that affects his job, thus making him responsible and accountable. This is said to increase the employee’s level of job satisfaction (Dimitrades, 2000). The implementation of TQM ensures that every worker in the organisation does his work with quality the first time, thus improving the efficiency of operation and avoiding some cost associated with waste. This in turn will offer more value to customers in terms of price and service quality, thus making them satisfied.

Implementation of TQM further ensures that organisations change how they perform activities so as to eliminate inefficiency, improve customer satisfaction and achieve the best practice (Porter, 1996). Porter noted that constant improvement in the effectiveness of operation is essential but not a sufficient factor for organisation to be profitable. According to Sila (2007), TQM helps in improving the quality of products and also reduces the scrap, rework and the need for buffer stock by establishing a stable production process. He argued that TQM will reduce the cost of production and time of production. Continuous improvement which is a feature of TQM is said to reduce the product cycle time thus improving productivity (Huang and Lin, 2002). Many other TQM practices such as training, information system management, relationship with suppliers etc have a positive impact on operational performance. The efficient management handling of these practices will improve efficiency and no doubt affect the profitability of the firm.

According to Sila (2007), TQM can minimize the total cost of production through ‘sole sourcing’. The cost in this case is reduced by limiting the number of suppliers used by the firm and providing them with necessary training and technology. The efficient functioning of an operation will then depend on how well the suppliers meet up with the expectations of the
organisation. This is why the TQM principle emphasises the totality of quality in all facets which includes the suppliers. TQM endorses the total quality approach in creating customer satisfaction. The total quality approach creates an integrated method of analysing operation by focusing the processes of production on customer satisfaction. Thus, it requires that quality be built into all the processes so as to be efficient in the overall operation (Andrle, 1994). Kaynak (2003), suggested that the effectiveness of TQM organisations should be measured by the degree of integration with their supplier bases because supplier quality management is a critical component of TQM. Operational effectiveness is then a function of how well the various units of an organisation carry out their functions with quality.

### 5.7 Limitations to the implementation of TQM

Oakland, (1995) identified factors that hinder the implementation of TQM. These include the thought that its implementation can be time consuming, bureaucratic, formalistic, rigid and impersonal. Ugboro and Obeng, (2000) in their research they found out that the half hearted implementation of TQM is a major reason for its failure in most organisations. According to them, organisations are only willing to implement just those aspects of TQM which is supported by existing organisational culture. Their findings revealed that employees did not feel as part of the decision making process and their ability to make contributions to quality improvement were restricted due to the limited authority granted them to carry out their activities. Smith, (2004) explained that quality management programs have failed because they were ‘programs of the month’. According to him, implementing quality throughout an organisation is not the result of a formalised programme but requires a cultural change in the way activities is conducted. Andrle, (1994) on his own assessment, claims that the adoption of incompatible quality approach by organisations results in the failure of TQM implementation, he further stressed that the delegation of quality leadership by managers might lead to the development of TQM bureaucracies that are ineffective like other functional departments.

According to Wilkinson et al (1998) the lack of commitment from any particular group within the organisation can be a serious barrier in management of quality. Most especially the non commitment by management to quality management is a major hindrance to the successful implementation of TQM. Asher (1996) observes that there is a need for
management to drive the ideology of TQM process in order to encourage employees to follow and also to prove to them about management’s commitment to quality.

Porter (1996) noted that TQM is essential for an organisation’s productivity and effectiveness but will not necessarily give an organisation competitive advantage over her competitors. TQM does not address strategic business issues like differentiation and positioning strategies. McCabe and Wilkinson (1998) noted that the failure of TQM can be attributed to the inappropriate implementation method adopted by the firms employed and not because of the principles of TQM itself. They believed TQM could be successful if it is adequately planned for and implemented according to plan.

Another reason for the failure of TQM is the emphasis given to individual rewards for TQM effort. This negates the recommendation made by Deming (1986), who argued that rewards needs to be tied to team work or department rather than individual. The failure of organisations to implement the rewards to group might lead to internal competition amongst employee and this will have a negative impact on team performance which TQM promotes. High cost of providing quality service is a major hindrance to the implementation of TQM, in organisations.

5.8 Quality Tools

TQM places a great deal of responsibility on all workers. If employees are to identify and correct quality problems, they need proper training. They need to understand how to assess quality by using a variety of quality control tools, how to interpret findings, and how to correct problems. Here, we look at seven different quality tools. These are often called the seven tools of quality. They are easy to understand, yet extremely useful in identifying and analyzing quality problems. Sometimes workers use only one tool at a time, but often a combination of tools is most helpful.
**Cause-and-Effect Diagrams**

![Cause-and-Effect Diagram](image)

Figure 5.4 Cause-and-effect diagram

Cause-and-effect diagrams are charts that identify potential causes for particular quality problems. They are often called fishbone diagrams because they look like the bones of a fish. The “head” of the fish is the quality problem, such as damaged zippers on a garment or broken valves on a tire. The diagram is drawn so that the “spine” of the fish connects the “head” to the possible cause of the problem. These causes could be related to the machines, workers, measurement, suppliers, materials, and many other aspects of the production process. Each of these possible causes can then have smaller “bones” that address specific issues that relate to each cause. For example, a problem with machines could be due to a need for adjustment, old equipment, or tooling problems. Similarly, a problem with workers could be related to lack of training, poor supervision, or fatigue.

Cause-and-effect diagrams are problem-solving tools commonly used by quality control teams. Specific causes of problems can be explored through brainstorming. The development of a cause-and-effect diagram requires the team to think through all the possible causes of poor quality.
Flowcharts

A flowchart is a schematic diagram of the sequence of steps involved in an operation or process. It provides a visual tool that is easy to use and understand. By seeing the steps involved in an operation or process, everyone develops a clear picture of how the operation works and where problems could arise.

Checklists

A checklist is a list of common defects and the number of observed occurrences of these defects. It is a simple yet effective fact-finding tool that allows the worker to collect
specific information regarding the defects observed. The checklist in Figure shows four defects and the number of times they have been observed. It is clear that the biggest problem is ripped material. This means that the plant needs to focus on this specific problem—for example, by going to the source of supply or seeing whether the material rips during a particular production process. A checklist can also be used to focus on other dimensions, such as location or time. For example, if a defect is being observed frequently, a checklist can be developed that measures the number of occurrences per shift, per machine, or per operator. In this fashion we can isolate the location of the particular defect and then focus on correcting the problem.

**Control Charts**

![Figure 5.7 Control Chart](image)

These are a very important quality control tool. We will study the use of control charts at great length in the next chapter. These charts are used to evaluate whether a process is operating within expectations relative to some measured value such as weight, width, or volume. For example, we could measure the weight of a sack of flour, the width of a tire, or the volume of a bottle of soft drink. When the production process is operating within expectations, we say that it is “in control.”

To evaluate whether or not a process is in control, we regularly measure the variable of interest and plot it on a control chart. The chart has a line down the center representing the average value of the variable we are measuring. Above and below the center line are two
lines, called the upper control limit (UCL) and the lower control limit (LCL). As long as the observed values fall within the upper and lower control limits, the process is in control and there is no problem with quality. When a measured observation falls outside of these limits, there is a problem.

**Scatter Diagrams**

![Figure 5.8 Scatter Diagram](image)

Scatter diagrams are graphs that show how two variables are related to one another. They are particularly useful in detecting the amount of correlation, or the degree of linear relationship, between two variables. For example, increased production speed and number of defects could be correlated positively; as production speed increases, so does the number of defects. Two variables could also be correlated negatively, so that an increase in one of the variables is associated with a decrease in the other. For example, increased worker training might be associated with a decrease in the number of defects observed.

The greater the degree of correlation, the more linear are the observations in the scatter diagram. On the other hand, the more scattered the observations in the diagram, the less correlation exists between the variables. Of course, other types of relationships can also be observed on a scatter diagram, such as an inverted. This may be the case when one is observing the relationship between two variables such as oven temperature and number of defects, since temperatures below and above the ideal could lead to defects.
Pareto Analysis

Pareto analysis is a technique used to identify quality problems based on their degree of importance. The logic behind Pareto analysis is that only a few quality problems are important, whereas many others are not critical. The technique was named after Vilfredo Pareto, a nineteenth-century Italian economist who determined that only a small percentage of people controlled most of the wealth. This concept has often been called the 80–20 rule and has been extended to many areas. In quality management the logic behind Pareto’s principle is that most quality problems are a result of only a few causes. The trick is to identify these causes.

One way to use Pareto analysis is to develop a chart that ranks the causes of poor quality in decreasing order based on the percentage of defects each has caused. For example, a tally can be made of the number of defects that result from different causes, such as operator error, defective parts, or inaccurate machine calibrations. Percentages of defects can be computed from the tally and placed in a chart like those shown in Figure. We generally tend to find that a few causes account for most of the defects.

![Figure 5.9 Pareto Analysis](image-url)
**Histograms**

![Histogram](image)

**Figure 5.10 Histogram**

A histogram is a chart that shows the frequency distribution of observed values of a variable. We can see from the plot what type of distribution a particular variable displays, such as whether it has a normal distribution and whether the distribution is symmetrical.

In the food service industry the use of quality control tools is important in identifying quality problems. Grocery store chains, such as Kroger and Meijer, must record and monitor the quality of incoming produce, such as tomatoes and lettuce. Quality tools can be used to evaluate the acceptability of product quality and to monitor product quality from individual suppliers. They can also be used to evaluate causes of quality problems, such as long transit time or poor refrigeration. Similarly, restaurants use quality control tools to evaluate and monitor the quality of delivered goods, such as meats, produce, or baked goods.
6. **Quality Management Systems in Construction**

   The sub-sections below introduce the general concept of quality and quality management system (QMS), in the context of the construction sector perspective; also introduced are the essential concepts of one of the well-known QMSs, the ISO 9001 standard. The two concepts are reviewed to contextualize the extent and significance of these research topics. Accordingly, the effectiveness of implementing QMSs and barriers to implementing the quality system are also justified.

### 6.1 Quality Defined in Construction

   With regard to any examination of quality issues in the construction industry, there are commonly three main terms that require objective definition and discussion. They are - what is actually meant by “quality”, “quality management system (QMS)”, and what constitutes a “total quality management (TQM)” philosophy.

   There is no precise or single definition of “quality”, and although many of the pioneers of the quality movement and gurus, such as Deming, Juran, Crosby, Feigenbaum, Taguchi and others, had their own individual definitions of “quality”, ISO DIS 9000:2000 generally defines quality as “the degree to which a set of inherent characteristics fulfill requirements” (Tricker 2008, 4). This means that in the construction industry, quality appears to be achieved whenever the needs of all those entities and individuals involved in projects or production or provision of services, such as consultants, constructors, project customers, and other related stakeholders, are fulfilled. Indeed, understanding the main concepts of quality is essential for a construction company in implementing a “quality management system” as a strategic management tool to gain benefits from the successful implementation of a quality system.

   Lam, Low and Teng (1994, 15), in the context of construction, define quality management as “that aspect of the overall management function that determines and implements the quality policy”, and “quality system” as “the organizational structure, responsibilities, procedures, processes and resources for implementing quality management”. Hoyle (1997) indicates that the production of desirable quality products does not happen by chance, but rather it must rely on the use of a quality system as the
management suite to meet all of the established quality goals. Hence, the essence of understanding “quality in construction” relates to achieving quality in the construction business performance through the implementation of a quality management system (QMS). This concept is supported by Thorpe and Sumner (2004, 3) who describe a QMS in companies as “a formal statement of an organization’s business policy, management responsibilities, processes and their controls, that reflects the most effective and efficient ways to meet (or exceed) the expectations of those it serves, whilst achieving its own prime business objectives”.

It is generally true to say that, in the global construction industry, one of the aims of every construction firm is to win the trust and acknowledgment of customers as a means of gaining business competitiveness and making greater profits; it therefore follows that this should also be one of the main reasons for QMS to become a prime focus in every construction company, for the fulfillment of customers’ needs and satisfaction.

Quality has a number of components, and a focus on only one aspect may result in a loss of customers (Center for the Advancement of Process Technology 2011). The application of a QMS in order to consider the important aspects of the quality, is one of the key quality concepts reviewed by the writers on quality, these quality concepts including the following:

1. A management commitment to reflect that “quality issues” must start from the top
2. Management systems to ensure consistency of operations;
3. The use of statistics as the tool to run and evaluate processes as efficiently as possible;
4. Team work and
5. Training to provide teams with the required knowledge of management systems, statistics, and improvement methodologies (ibid 2011).

In an attempt to employ quality as a key component of the success of construction businesses today, many researchers state that it requires a well-implemented QMS in order to ensure the effectiveness of the QMS.

Thorpe and Sumner (2004) have proposed a number of fundamental concepts for an effective QMS, which include the following:
- A system that enables a company to identify with, and completely meet, customer’s needs
- A system that clearly defines the responsibilities for carrying out defined functions and activities
- A system that is representative of the most effective and efficient organization for carrying out business processes and various discrete activities
- A system that recognizes the sound advice offered by standards such as ISO 9001
- A system that is successful because of people’s understanding commitment, due a sense of ownership and,
- A system that is formally and continuously reviewed in a quest for ongoing improvements.

These guideline concepts should be able to assist construction companies in the establishment and implementation of their QMSs, in a way that enables their organizations to apply a holistic and systematic approach to quality management, as espoused in the philosophy of Total Quality Management (TQM) of Deming (1986) and others.

Total Quality Management (TQM) is generally considered to be a higher level concept of strategic achievement than that provided by a QMS. McGregor and Palmer (2002) view TQM, firstly, as an approach to ensure that a whole organization is involved in producing high quality outcomes in everything they do; secondly, in improving the continuous implementation of quality management; and finally, in achieving the primary objective of the concept, that of customer satisfaction. Based on these objectives and guidelines for providing continual improved quality management in construction companies, an effective TQM-based set of values is also an essential requirement for services’ providers, to generate qualified activities and achieve the desired outcomes.

In several scholarly articles written by Wong and Fung (1999), Low and Teo (2004), Ahmed et al. (2005), Farooqui and Ahmed (2009), Shibani, Soetanto and Ganjian (2010), it is generally concluded that the concepts of QMS and TQM are at about the same level. Some construction companies have adopted a TQM approach as an initiative to help raise quality and productivity, while others, who were reported to be adopting TQM, were in fact actually applying the eight basic elements of an ISO 9001 based QMS. Thorpe and Sumner (2004) have
recommended that construction companies that are eager to benefit from the TQM approach, start by establishing a QMS concept as their first step on what Grossman and Helpman (1989), among others, have called the „quality ladder“.

![Image of QMS and TQM concepts](image)

**Figure 6.1: A simple illustration of the interface of the QMS and TQM concepts**

The main reason for undertaking a review of these two quality concepts is that among construction companies, the concepts of QMS and TQM are not always well understood. Based on preliminary analysis, some local contractors understand what a QMS is, they do not have a clear understanding of the philosophy of TQM. However, for companies and contractors who successfully implement QMS, they ultimately target TQM in their quest for total quality achievement in their companies.

### 6.2 ISO 9001 Standard

Quality control systems were originally developed from United Kingdom (UK) nuclear and military standards, and then rolled out into the manufacturing industry. It was much later (in the 1980s and early 1990s) that the systems were adopted by UK construction companies to meet local and national government requirements for the construction industry, when companies were required to have certified quality systems in order to take up offered bidding opportunities (Thorpe and Sumner 2004).
The ISO 9000 series has now become the QMS model recommended by the followers of the quality movement as a benchmark for implementation of good management and process control in a variety of industries and sectors (McCornac 2006; Tricker 2008; Fotopoulos, Psomas and Vouzas 2010; Wahid, Corner and Tan 2011). The model has been particularly widely adopted by the construction industry (Chini and Valdez 2003; Turk 2006; Lordsleem, Duarte and Barkokébas 2010; Watson and Howarth 2011). The first series of ISO 9000 developed by the International Organization for Standardization-Technical Committees (ISO-TC 176) in 1987, was updated in 1994 and 2000, with the latest version of this standard being ISO 9001:2008. The 2008 version did not introduce any major changes relative to the 2000 version, and therefore does not require the re-writing of quality documents to suit the most recent version (Vianna 2007; International Organization for Standardization 2011). The ISO 9001 standard is actually a generic one, which can be used successfully in construction companies and on their projects, even though every project is unique and involves different sub-contractors and suppliers.

The QMS-ISO 9001 standard is made up of five main clauses and 23 sub-clauses, each of which contains requirements that should be fully implemented to gain the potential benefits from the adoption of the system. There are 20 elements of ISO 9001 which are used as the basis of ISO 9001:1994. These elements have been replaced by five clauses for undertaking quality processing. However, the twenty elements are clearly identifiable within the process-based approach for implementing ISO 9001:2008 (Watson and Howarth 2011). The twenty elements have been adapted for construction procedures to cover a wide scope of quality related activities of construction-related firms (Chini and Valdez 2003), as QMS elements to meet construction organization and project conformity needs. In developing and maintaining ISO 9001, the collective experience and knowledge of international experts relating to ISO-TC 176 has been used for the development of the eight major quality management principles embedded in the ISO 9001 standard, that can be used by management as a basis for improving an organization’s performance (Tricker 2008). These eight quality management principles are:

1. Customer focus

The company focuses on customer requirements and expectations.
2. Leadership

The leaders establish unity of purpose and direction of the company.

3. People involvement

Employees are fully involved and their abilities are empowered for the company’s benefit.

4. Process approach

Project activities and related resources are managed as a process.

5. Systems approach to management

The company identifies, understands, and manages interrelated processes as a system.

6. Continual improvement

The company has a strategic objective for permanent and continuous improvement of overall performance.

7. Factual approach to decision making

Decision-making is based on an analysis of relevant data and information.

8. Mutually beneficial supplier relationships

The company and its suppliers have interdependent and a mutually beneficial relationship.

<table>
<thead>
<tr>
<th>ISO 9001 Elements</th>
<th>Quality Functions Required</th>
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<tbody>
<tr>
<td><strong>E1</strong></td>
<td>Management responsibility</td>
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<td></td>
<td>• Define, document and publicize quality policy</td>
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<tr>
<td></td>
<td>• Define, document responsibility, authority and interrelations of staff</td>
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<td></td>
<td>• Identify and provide adequate resources</td>
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<td></td>
<td>• Appoint quality manager</td>
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<td>• Review quality systems on a regular basis</td>
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<td>Quality system</td>
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<td>E2</td>
<td>Establish, document and maintain quality system</td>
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<td>E3</td>
<td>Contract review</td>
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<td>E4</td>
<td>Design control</td>
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<td>E5</td>
<td>Document and data control</td>
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<td>E6</td>
<td>Purchasing</td>
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### Impact of Organizational Culture on Total Quality Management in Construction Industries

<table>
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<tr>
<th>E7</th>
<th>Control of customer’s supplied product</th>
<th>• Control verification, storage, and maintenance of customer-supplied product</th>
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</table>
| E8   | Product identification and traceability | • Identify material and semi-finished product from receipt and during all stages of production, delivery, and installation, where appropriate  
• Provide unique identification of individual product or batches where specifically required |
| E9   | Process control                        | • Identify, plan, and control production, installation and servicing processes, including provision of documented procedures and suitable equipment  
• Assign qualified operators to carry out special processes |
| E10  | Inspection and testing                 | • Conduct receiving inspection and testing of incoming materials and components  
• Conduct in-process inspection and testing of semi-finished work in accordance with quality plan  
• Maintain signed-off records of inspections and tests |
| E11  | Control of inspection, measuring and test equipment | • Use inspection, measuring, and testing equipment capable of necessary accuracy and precision  
• Calibrate the equipment at prescribed intervals, or prior to use, and indicate its calibration status |
| E12 | Inspection and test status | • Review previous results when the equipment is found to be out of calibration |
| E13 | Control of non-conforming products | • Indicate by suitable means the conformance or nonconformance of product or work with regard to inspect and performed |
| E14 | Corrective and preventive action | • Identify and segregate, when practical, any nonconforming product or work |
| E15 | Handling, storage, packaging, preservation and delivery | • Review and dispose of the nonconforming product or work by an authorized person |
| E16 | Control of quality records | • Inspect and/or test the product or work again after repair |
| | | • Investigate cause of nonconformities, including client complaints |
| | | • Take corrective/preventive action to eliminate cause/potential cause of nonconformities |
| | | • Implement and record changes to document procedures resulting from corrective/preventive action |
| | | • Ensure that corrective/preventive action is taken and that it is effective |
| | | • Establish methods of handling product that prevent damage or deterioration |
| | | • Use designated storage areas to prevent damage or deterioration |
| | | • Assess condition of product in stock at appropriate intervals |
| | | • Protect product during delivery |
| | | • Retain quality records for prescribed period |
| | | • Maintain quality records in such a way that they are identifiable, retrievable and secured against damage, deterioration, or loss |
| E17 | Internal quality audits | • Plan and schedule internal quality audits  
• Assign independent personnel to carry out internal quality audits  
• Conduct follow-up audits if necessary |
|---|---|---|
| E18 | Training | • Identify training needs of staff  
• Provide training required |
| E19 | Servicing | • Verify that servicing meets specified requirements |
| E20 | Statistical techniques | • Identify the need for statistical techniques in quality control  
Implement and control the application of statistical techniques |

Table 6.1: The twenty elements of the ISO 9001 standard relating to building construction

The relationship between the structure of five clauses of the ISO 9001 standard and the eight quality management principles, and the incorporation of the twenty elements with the five clauses, are shown below in Table 6.2.

In summary, as an international standard for QMS (in comparison with other quality standards and awards - Six Sigma, Malcolm Baldrige National Quality Award Criteria, The European Foundation for Quality Management Excellence Model-EFQM EM), ISO 9001 is now widely accepted in many manufacturing, production and services industries, because it specifies what an organization should do to achieve better quality management and improvement. It is acknowledged by McCornac (2006) that the standard focuses on the way an organization goes about its work, and not directly on the results of this work. This QMS standard is currently being adopted by construction companies and is officially recommended as an approach to solving quality problems in the construction industry and for meeting customer’s needs.
Table 6.2: The relationship between the structure of five clauses of the ISO 9001 standard and the eight quality management principles

<table>
<thead>
<tr>
<th>ISO 9001 Principles</th>
<th>Customer Focus</th>
<th>Leadership</th>
<th>People involvement</th>
<th>Process approach</th>
<th>System approach</th>
<th>Continual improvement</th>
<th>Factual approach to decision making</th>
<th>Mutually beneficial supplier</th>
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<td>4.0 Quality Management System</td>
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<td>4.1 General requirements</td>
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<td>4.2 Documentation requirements</td>
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<td>5.0 Management Responsibility</td>
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<td>5.1 Management commitment</td>
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<td>5.2 Customer focus</td>
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<td>5.3 Quality policy</td>
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<td>5.4 Planning</td>
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<td>5.5 Responsibility, authority and communication</td>
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<td>5.6 Management review</td>
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<td>6.0 Resource Management</td>
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<td>6.1 Provision of resources</td>
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<td>6.3 Infrastructure</td>
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<td>6.4 Work Environment</td>
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<td>7.0 Product Realization</td>
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<td>7.1 Planning of product realization</td>
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<td>7.3 Design and development</td>
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## 6.3 The Effectiveness of Implementing a Quality Management System

Successful implementation of a QMS, as espoused in the relevant ISO 9001 standard, requires effective planning, operation and review, as well as continuous improvement of the system at all levels of an organization. Effectiveness has been defined by the British Standards Institute (BSI) (2009) as the extent to which planned activities are realized and planned results are achieved. The term “effectiveness” is particularly pertinent to quality management system implementation, as companies that adopt a QMS must meet their specified quality requirements and prescribed quality objectives without any shortfalls, in order to be seen to have successfully implemented their QMSs.

However, according to Al-Nakeeb et al. (1998), the definition of “effectiveness” from BSI appears to mislead people into thinking that it implies that the effectiveness comes from solely meeting the specified requirements and the prescribed quality objectives. In fact, it refers to the effectiveness of the system in meeting and complying with the specified requirements of the adopted standard. This means that effectiveness in the overall sense should really mean both things; the full meeting of a company’s own specified quality requirements, together with meeting the prescribed quality objectives (Kam and Tang 1997), referred to in the eight quality management principles and the elements of ISO 9001. In
addition, Oztas, Güzelsoy and Tekinkus (2007) argue that the effectiveness of a system needs to be judged by how well a construction company operates and whether it achieves its goals in meeting customer expectations. This view is illustrated in Figure.

![Figure 6.2: An Effective Company’s QMS Complies with ISO 9001 Principles and Elements](image)

Recent publications on construction quality management highlight the important activities that should be performed in relation to the application of an effective QMS-ISO 9001. According to Rumane (2011), an organization needs to demonstrate its ability to consistently provide products that meet or exceed customer expectations and satisfaction, while also adopting appropriate processes for the continued improvement of the QMS and related assurances of conformity to customer and applicable regulatory requirements. Watson and Howarth (2011) also emphasize that for ISO 9001 to remain a process-based system with heavy emphasis on compliance, an organization is required to rigorously conduct an assessment of organizational performance, set against a standard and leading to accreditation. Clearly, the context of an effective QMS implementation is to ensure that work is performed according to specifications, throughout the design and development phases, manufacturing and construction, and servicing, and also ensure that customers are satisfied
with the resulting products and services (Beaumont 2006). Figure illustrates the process model of ISO 9001, with the focus on customer requirements and satisfaction.

![ISO 9001 Process Model](image)

Figure 6.3: ISO 9001 Process Model (Watson and Howarth 2011)

Effective implementation of a quality management system (QMS), and espousing quality values or adopting a high-level quality philosophy, whether by virtue of operating a QMS-ISO 9001 or applying a TQM approach, potentially provides benefits that are needed, even in the most competitive construction environments. Table summarizes the potential benefits of ISO 9001 deployment for construction organizations.

<table>
<thead>
<tr>
<th>Area of Improvement</th>
<th>Benefits of ISO 9001</th>
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<tbody>
<tr>
<td>Construction project</td>
<td>- Preventing work repetition and project delays</td>
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<td></td>
<td>- Buildability factor of most projects can be increased while the project cost is decreased</td>
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<tr>
<td>Impact</td>
<td>Aspects</td>
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<td>--------</td>
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</tbody>
</table>
| **Project management** | - As an effective and appropriate working platform at both design and construction stage of a project  
- Efficient in using material resources |
| **Quality** | - Consistent and effective control of key processes and project management  
- More efficient and effective utilization of scarce resources  
- Failure to meet specifications can be minimized  
- Promoting control of suppliers and subcontractors and the development of effective supply chain management  
- Provide a corporate quality advantage |
| **Organization performance** | - World-wide recognition and be chosen to bid in both local and global market contracts  
- Provides a means of achieving a top-quality performance in all areas/activities  
- Reduced inspection costs hence improved corporate profitability  
- As a tool to help contractors establishing and measuring their performance indicators |
| | - Improvement of organization communication system and working environment |
### Table 6.3: Benefits of Applying ISO 9001 in Construction Organizations

| Management system | • Better efficiency  
|                   | • Continual improvement  
|                   | • Greater emphasis on leadership, team spirit and motivation  
|                   | • Change management and adequacy of training  
|                   | • Planning and review process to ensure that the system in place remains suitable  
|                   | • Effective and capable of identifying new opportunities  
|                   | • Provide clear and valid operating procedures  

All the above advantages cited for construction organizations are based on the lessons learned from the use of an appropriate and effective quality system framework for controlling the processes required when constructing a project. An example cited in the research of Zin, Chen and Ali (2009) is that the majority of Malaysian constructors have been able to improve their company competitiveness by 80%, after having certified to ISO 9001. This clearly indicates that QMSs need to be developed and implemented effectively, for any construction company wishing to become a sector leader.

Nevertheless, given the benefits of ISO 9001 deployment, the implementation process can be a problematic one. The following sub-section reviews critical issues relating to the successful implementation of effective QMSs.

### 6.4 Barriers to Implementing Quality Management Systems in construction firms

A number of researchers in the area of QMS implementation are of the opinion that ISO 9001 is not an appropriate standard for use in construction firms. For example, Landin (2000), in studying the Swedish construction sector argues that ISO 9001 is difficult to apply by construction companies because its clauses are too general. Construction projects,
practices, contracts and specifications are regarded as unique and specific in every project, and they usually provide different specific products and services outcomes that are difficult to be fully incorporated within a generic system such as ISO 9001.

Turk (2006) notes that the development of an ISO 9001 certified QMS requires a huge amount of written documentation and needs a long time to integrate into a company’s management system, leading to potential substantial increases in operating costs. The author further notes other significant problems confronting the ISO 9001 certification process within the Turkish construction firms that prolongs the registration process as well as making it expensive. Some company’s management is not open to research and criticism, while in others the personnel systems needs restructuring for the establishment of QMS.

In addition to the above barriers, Bubshait and Al-Atiq (1999), in describing a Saudi Arabian case, indicate that overload of work for the quality assurance team and the tendency for disputes to arise concerning quality issues in internal organisations, are also among the major causes of difficulties in implementing the ISO 9001 quality standard in construction companies. Further to these views, Quazi, Hong and Meng (2002) make the point in their study of the Singapore construction sector, that there is evidence to suggest that it cannot always be proven that ISO 9001 certified companies do actually provide qualified products and services. From these contrary views, the key question that arises is why some construction companies cannot effectively empower their organizations to establish successful QMS arrangements, while others are successful in implementing a QMS.

According to Oztas, Güzelsoy and Tekinkus (2007), the differences and uniqueness of the construction industry from other industries (e.g., a long time for project completion; human relationships generally formed once; difficulty in defining quality standards and feedback relating to the construction processes) make it difficult for construction companies to implement QMSs, which can be fragmented and slow in their attempts at quality improvement (Leonard 2010). In addition, the fact that the construction industry has historically been reluctant to deal with changes (Haupt and Whiteman 2004; Low and Hong 2005) is reflected in slower implementation of ISO 9001 especially in developing countries.
Despite the unique nature of the characteristics surrounding the construction industry, reflect on the questions related to QMS issues in general, and these views are summarized as follows:

**Typical problem 1: Management Attitude and Purpose**

If the purpose of obtaining the ISO 9001 certification from the perspective of management is solely as a marketing initiative, or due to customer pressure, there is no guarantee that there will be any internal improvement of the organization’s effectiveness as a result of implementing an ISO 9001 quality system.

**Typical Problem 2: Implementation by Consultants**

Management frequently engages consultants to write a quality manual, quality procedures and develop other ISO 9001 required documents. However, sometimes quality management consultant(s) may be unfamiliar with the business concepts and culture of the company (ISO9000Council.org 2009). The consultant tries to mold the entire company and align it to ‘a one-size-fits-all’ ISO 9001 set of quality procedures (ibid 2009). In addition, management will often attempt to choose the perceived „easiest“ certification body recommended by the consultant in the market, reflecting a misconception of the reasons for obtaining ISO 9001 certification.

**Typical Problem 3: ISO 9001 Management Representative without Power**

According to ISO9000council.org (2009), management often mistakenly considers ISO 9001 standards as solely a task of documentation, to be fulfilled by companies, rather than as a toolset for changing and substantially improving management systems. As a result, any appointed Quality Management Representative (QMR) is limited to preparing the quality documentation and setting up a workable QMS, while lacking the power to make real decisions or effect changes. In addition, the QMR often lacks adequate authority to fully engage people during the project implementation process.

**Typical Problem 4: Insufficient Resources**

It is crucial to the success of ISO 9001 implementation that management allocates sufficient financial resources for the establishment and implementation of an effective QMS.
A dedicated QMR needs to be trained and guided, while top management needs to be convinced of the rationale and need for, an ISO 9001, and understand its potential benefits. An ISO 9001 quality manual, quality procedures and other quality system documentation needs to be written, work processes throughout the company need to be analysed and streamlined, and employees need to be trained.

**Typical Problem 5: Lack of Improvement**

Since organizations all function in dynamically changing business environments, the ISO 9001 standard must be adapted constantly to continue facilitating the improvement of business competitiveness and technologies (ISO9000Council.org 2009). The lack of improvement happens when management has the misconception that ISO 9001 certification alone is the final achievement (ibid 2009). McCornac (2006) observed that there was no clear improvement in a company’s business performance when the extent of changes in the company’s management system after ISO 9001 registration were only relatively minor.

**Typical Problem 6: Making it Complicated**

According to ISO9000council.org (2009), ISO 9001 does not need to be complicated. However, the council admits that the requirements of the ISO 9001 standard can be rather general and thus difficult to understand, because they are designed for any company of any size in any industry. This situation becomes more complicated when management and staff are not provided with awareness and understanding of how the system works, or of the potential benefits it can provide for their companies. Rather, they feel that they exposed to over-bureaucratic systems, (including ‘stiff’ auditors), and are not helped by apparently bad standard templates and training tools.

From the above it can be concluded that problems relating to the attitudes and perceptions of management, and related lack of commitment, are the main deterents to the effective implementation of the ISO 9001 in many organizations. Another consideration that appears to be associated with these problems relates to the differing cultures that exist in every organization, and the impact that these cultural traits may potentially have on the effective implementation of QMSs and related attitudes towards complying with the attributes of ISO 9001.
7. Research methodology

The research undertaken within the context of this thesis was aimed at the development of a comprehensive Culture-based Quality Management System Improvement Implementation Framework for construction industries, suitable for integration into their own company and project quality management practices, to help them achieve better project quality delivery. By providing a framework for the effective implementation and continuous improvement construction companies. Organizations could then be expected to begin to move towards operating total quality management practices, which should help to improve their delivery capability of construction projects, and thereby also contribute to giving these organizations a greater competitive advantage in local, national and global markets.

In order to achieve the research aim above and address the issues raised, few questions needed to be addressed:

1. What is the current status of the quality management systems (QMSs) being implemented by construction companies?
   1.1 What are the levels of implementation of the existing QMSs?
   1.2 If there are obstacles to the implementation of QMSs, what are they?
   1.3 What are the achievements of companies due to implementing the QMSs?
2. What are the organizational culture profiles of construction companies?
3. How can effective QMSs be properly established, and be effectively implemented and continuously improved, by construction companies?

With reference to the above research questions, the following research objectives were established, which then became the focus of the research within the context of this thesis.

1. The examination of the effectiveness of the QMSs being operated in construction companies, including identify current problems within the systems and the examination of company’s performance while implementing their TQM.
2. The assessment of the organizational culture profiles of construction companies and an analysis of the influence of different organizational culture profiles on QMSs implementation.
3. The design and development of a Culture-based Quality Management System Improvement Implementation Framework for construction companies to effectively implement QMSs, designed to achieve better bottom-line outcomes, while also facilitating the evaluation of the usefulness and applicability of such a framework.

Based on the research questions and objectives, a mixed methodology of both quantitative and qualitative approaches was employed to collect the relevant information associated with the current status of QMS practices and organizational culture issues, within the construction industry. Prior to undertaking the quantitative questionnaire survey, (mainly applied to accomplish research objectives 1 and 2), a preliminary study was carried out. A qualitative approach (i.e. a focus group discussion), was used to obtain results to satisfy research objective 3, aimed at an evaluation and validation of the proposed culture-based QMS improvement implementation framework by construction company practitioners, policy makers and academic experts. Each research approach was supplemented by a detailed analysis and interpretation of the data collected.

<table>
<thead>
<tr>
<th>Research Approach</th>
<th>Research Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative Questionnaire</td>
<td>The examination of the effectiveness of the QMSs being operated in construction companies, including identify current problems within the systems and the examination of companies’ performance while implementing their QMSs.</td>
</tr>
<tr>
<td>Quantitative Organizational Culture</td>
<td>The assessment of the organizational culture profiles of construction companies and an analysis of the influence of different organizational culture profiles on TQM implementation</td>
</tr>
<tr>
<td>Assessment Instrument</td>
<td></td>
</tr>
<tr>
<td>Qualitative Focus Group Discussion</td>
<td>The design and development of a Culture-based Quality Management System Improvement Implementation Framework for construction companies to effectively</td>
</tr>
</tbody>
</table>
implement TQM, designed to achieve better bottom-line outcomes, while also facilitating the evaluation of the usefulness and applicability of such a framework.

Table 7.1: An overview of the research process

This research is done with the help of six employees from six different construction companies, working in different countries. These guys helped me by providing proper information regarding their company’s quality policies and strategies through answering the questionnaire (provided in annexure). The basic information about them is given in the table.

<table>
<thead>
<tr>
<th>No:</th>
<th>Name of employee</th>
<th>Name of company</th>
<th>Position</th>
<th>Experience (years)</th>
<th>Number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mr. Jacob Mathew</td>
<td>Arabtech LCC, UAE</td>
<td>Finance Manager</td>
<td>4</td>
<td>&gt;5000</td>
</tr>
<tr>
<td>2.</td>
<td>Mr. Arun Jose</td>
<td>Vellappallil constructions, kerala- India</td>
<td>Purchasing Manager</td>
<td>2</td>
<td>&gt;1000</td>
</tr>
<tr>
<td>3.</td>
<td>Mr. John Simon</td>
<td>Dorsch Groupe, Doha- Qatar</td>
<td>Documentation Manager</td>
<td>1.5</td>
<td>2500+</td>
</tr>
<tr>
<td>4.</td>
<td>Mr. Suneesh Mathew</td>
<td>Wood group-CCC Muscat - Oman</td>
<td>Logistics Manager</td>
<td>7</td>
<td>&gt;5000</td>
</tr>
<tr>
<td>5.</td>
<td>Livin Varghese</td>
<td>Decibel constructions and inspections, India</td>
<td>Quality controller</td>
<td>3</td>
<td>500+</td>
</tr>
<tr>
<td>6.</td>
<td>Naif Latif</td>
<td>Al redwan contracting, Saudi Arabia</td>
<td>Project Manager</td>
<td>2.5</td>
<td>2000+</td>
</tr>
</tbody>
</table>

Table 7.2: Details of people involved in survey

The analysis of the questionnaire and its outcomes are used for the development of the research.
8. **The Existing Use of the ISO 9001 Standard in Construction Companies**

The growth of the national economy, as well as the improvements in the roll-out of national development, appears to be a positive driver for the construction industry, especially when the Governments have speeded up its infrastructure development plan and investment in delivery of roads, water resources and human settlement infrastructure, in support of the acceleration of economic growth. These prevailing conditions trigger higher levels of competition among national and foreign contractors in tendering for government construction projects and investing focus on enhanced maintenance demands.

The macro and micro environments of Construction Company, which in turn influence the way they operate, are also factors pertinent to market competition. In the macro environment, a variety of trends in political, economic, social and legal developments are assuming greater strategic importance for contractors in market competition (idem 2011). On the other hand, in a micro context, low levels of competitiveness, low barriers for entry into the construction industry (Budiwibowo et al 2009), inefficiency and high-cost transactions, collusion, and incompetent human resources, are among the problems that national contractors have to deal with in dealing with market competition. This is reflected especially in the low quality of delivery of infrastructure project, and dissatisfaction by project owners and end-users.

In response to this scenario and these drivers, for the past decade the construction sector has had the intention (or has been made) to promote the development and implementation of quality management systems (QMSs) among its various players. Quality issues must now be seriously considered by both the Governments and the construction industry, particularly as it is recognized that the construction services at the national level have not been optimal, and the role of foreign construction companies undertaking construction of both government and private projects is gradually increasing (Sudarto 2007; Construction Management and Engineering of Bandung Institute of Technology 2009).

In order to embrace the issue of ‘quality in construction’, the Governments have enacted regulations for construction companies undertaking projects, particularly those that are government related. A basic set of regulations relating to operations of construction services was formulated in order to provide direction for the growth and development of
construction services, in creating a solid business structure, and delivering reliable, highly competitive, and quality construction work. Specifically, Presidential Decree was designed to effectively and efficiently control the conduct of government procurement activities for products and services by all stakeholders involved in construction activities, including construction companies. The regulation following the acknowledgement of the need for corrective action aimed at providing healthy competition with changes in management and business efficiency.

A decree directed primarily at quality management system implementation, was developed by most of the countries. This decree is known as the Construction Quality Management System of the Department of Settlement and Regional Infrastructure. Within the context of this decree, the Government refers to ISO 9001 as a reference standard for the development of QMSs for contractors engaged in the department’s construction projects. The decree is a follow-up to the Decree of Ministry of Settlement and Regional Infrastructure on Guidelines for Construction Services Procurement by Government Agencies. In these guidelines, it is stated that government working units or procurement committees should recognize the fact that certain contractors are ISO certified, and for special or complex work, or works involving high levels of technology, the Director General may include the requirement for tendering contractors to be ISO 9001 certified.

The strategic role of construction services in nation’s development has been addressed by the establishment of a related Government act, various new decrees and regulations. However, specific regulations on the development and implementation of QMS have not been adequately addressed to date, and the government instruments and association support programs mentioned above, just contain general descriptions of what construction companies should do. Consequently, construction organizations (especially large-scale contractors) view these QMS-related policies as merely relating to the need for possessing relevant qualifications for registration to participate in government procurement activities. Additionally, these QMS-related regulations really require more comprehensive supporting explanation in order to make the requirements of such system more understandable and practical for constructors and builders, this will definitely help construction organizations to more effectively implement their QMSs.
An implication of the Government regulations is that construction companies are inspired to get the ISO 9001 certification immediately. However, the additional motives the construction companies might have in proceeding with the certification process has been an important component of the research in this study. Ideally, the primary aim of construction companies in obtaining their ISO 9001 certification would be to satisfy their customers. This aim refers to the first principle of ISO 9001, which states that “Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations” (Tricker 2008, 26). Another aim that follows this primary one is for a company to be successful in its business performance. It would therefore be useful to discover whether the motives of companies in developing their quality management system can generate, or be generated from, those aims.

A considerable amount of research has been carried out relating to the study of the motives of construction companies in wishing to become ISO 9001 certified. There are some motives that have proven to be successful in driving construction companies in achieving their goals and expectations. Among this one of the motives is the aim of improving the quality of work done and thereby gain a competitive advantage, and to reduce the company’s operating costs. However, many construction firms are motivated to obtain ISO 9001 certification on account of client demands for it and/or due to specific tender requirements for such certification.

This study aimed at identifying the factors which have prompted some contractors to become ISO 9001 certified. Chini and Valdez (2003) in their research on QMS in the US construction industry, indicate that “knowledge about each company’s motivation for certification was a key component of their study”. By conducting studies into the motives which underlie a decision to apply for, or resist consideration of, ISO 9001 certification, a QMS framework might then potentially be designed that will assist some construction companies in achieving their aspirations for growth based on a more competitive business model, while others would be able to more clearly view the benefits of, and processes required to maintain, ISO 9001 certification.

Given the pressing need for implementing ISO 9001 for the establishment, implementation and operation of a QMS, every construction company should develop its own
Impact of Organizational Culture on Total Quality Management in Construction Industries

QMS, including establishing full and auditable quality documentation (i.e., quality manuals, quality procedures, work instructions, and internal and external audit requirements, as well as regular management reviews). Currently all contractors and builders, have already obtained ISO 9001 certification in order to become registered for government work, while many others are trying to get their required certification. In order to assure the consistency of constructed project quality, private project owners also now require their preferred contractors to operate a formal quality system as a guarantee for raising quality standards at all project stages, and to ensure that project operations are based on proper quality planning.

From the preliminary analysis, it was revealed that during the establishment phase, when setting up their ISO 9001 systems, construction companies commonly hire a quality consultant to assist and guide them in the preparation of a timeline and program, to achieve the goals of obtaining certification, developing quality documentation as required by ISO 9001, and training their workforce and Quality Assurance (QA) team. The needed to appoint an ISO 9001 consultant is based on the construction companies need for assistance for the interpretation of the ISO 9001 requirements and integrate them into their own construction company business processes and procedures; this being a necessary part of the quality-based approach. The interpretation of all clauses of the ISO 9001 is one of the most important milestones in the early stages of establishment of a quality system. They argue that the failure in executing proper ISO 9001 interpretation may lead to an ineffective and inefficient implementation stage, making the expected benefits of TQM implementation difficult to achieve. Despite the role of ISO 9001 consultants in the early stages of development of a quality-based system, for the later stages companies need to have the confidence and ability for maintaining and improving the system, based on the use of their own resources.

The benefits of holding an ISO 9001 certificate have been acknowledged by builders and construction firms. Pamulu and Husni (2005) and Susilawati, Salim and Soesilo (2005), based on their studies, point out that the certified construction companies find it easier to win a higher number of contracts because project owners trust them more than non-certified companies. This has been further supported by Nugroho, Saroso and Nurcahyo (2009) who report that from a builder’s perspective, companies which implement a TQM have a higher chance of winning contracts. Project sponsors and clients are more certain that projects will be finished on time and to specified quality standards driven by the TQM. Recent research
findings of Asa, Abidin and Latif (2008) note that by applying ISO 9001 certified QMSs, construction companies have achieved greater overall profits than in the past, while at the same time a new quality-oriented movement has started to be developed. Despite this progress, Sudarto (2007) admits that the construction industry still needs to make further progress in this area to be able to produce sustainable construction projects and have competitive power within developing countries in the Asian region as well as globally.

The positive achievements of some construction companies from the implementation of TQM have apparently not been experienced by all companies. Misconceptions among some constructors and builders regarding the basic concepts of ISO 9001, as well as a prevalence of the wrong motives for developing and implementing a TQM have led to a low level of quality work in many contemporary projects in the construction industry. This further exacerbates a long-standing problem of poor quality outcomes in projects.

Discussion of the issues related to why TQM cannot be effectively applied by some constructors and builders is very limited in the extant literature. As reviewed in the subsection on barriers to TQM implementation in the global construction industry, Susilawati, Salim and Soesilo (2005), Sudarto (2007) and Novessro (2009) indicate that the main root-causes for ineffective ISO 9001 certified TQM implementation by contractors and builders include: a lack of top management commitment; minimum availability of supporting resources; failure in applying continuous improvement concepts; unrealistic timelines set up for rolling-out TQM programs; failure in disseminating TQM programs to all organizational levels (since it is assumed that the system is only appropriate for manufacturing processes); unsuccessful human resources training with regards to becoming an agent of change; unsuccessful definition and design of TQM documentation; the fact that implementation of TQM is only allowed as an add-on to standard operating procedures; and, that TQM are applied without conducting a comprehensive review of existing management systems.

In addition (but of particular significance), some of the best practices that result from the proper use of ISO 9001 and implementation of a good TQM, have been undermined by the fact that companies implementing their TQM often possess weak corporate cultures. Gapeksindo (2007) opines that deterioration in the implementation of TQM occurs from the
time of tender-bidding throughout the period of project execution. The authors provide an example of a winning project which priced at only 50-60% of total project budget estimate. The question then rose related to whether it was realistic to promote quality assurance in a project, the contract for which was based on a ‘cut-throat’ tender price. Supporting this view, Rayendra L. Toruan in an editorial foreword to Quality Management Implementation Guidelines (LPJK 2005), criticized the practice of „lowest-bid tender award processes“ because of the possibility that such awards might be influenced by corruption-collusion and nepotism-(CCN), with dubious mark-up practices which inevitably affect the quality

The ISO 9001 initiative is not a major factor that affects construction business performance. The reason cited for this opinion is because ISO 9001 can be easily obtained by using an experienced external party (ibid 2009). The company employees are only ‘contract-laborers’ hence it is rather difficult to involve them in “quality management practices” in the parent company. Such a conclusion, if true, would reduce the incentive of construction companies in the adoption of ISO 9001 standards. Schein (2004) provides strategies for leaders, during the early stages of team work development, for incorporating new workers (or contract-workers) into a company’s quality culture. The research component of this thesis undertakes the identification of problems and issues specifically relating to this case, in order to understand how to overcome similar barriers to the implementation of TQM for the achievement of more positive business outcomes.

In summary, there are few research articles which have reporting on the results of an examination of the use of ISO 9001 by construction companies, especially in terms of identifying the barriers that prevent proper implementation of quality initiatives. The research that forms the basis to this thesis aims to provide a much-needed and comprehensive study on how well TQM and ISO 9001 are being used by construction companies, together with how their implementation might be better guided by the establishment of a new framework for use by client bodies and constructors, to produce better output, improve business outcomes, and strengthen the organizational culture. These research issues have been supported by the use of a quantitative questionnaire survey as a primary tool, supported by qualitative focus group discussions as a complimentary tool, to validate results from the survey questionnaire.
9. **Organizational Culture in the Construction Industry**

In the previous section it has been stated that, other research reveals that the organizational culture does correlates with TQM implementation. This study therefore aims to investigate the current organizational culture profiles of contractors, and the influence of different culture types on quality system implementation. The following sections aim to explain how quality management systems and practices may be better implemented, and better business outcomes and customer satisfaction achieved, using the strengths and directions of organizational culture.

The organizational culture assessment model of Cameron and Quinn (2006), derived from Quinn and Rohr Baugh’s (1983) earlier Competing Values Framework (CVF) is reviewed, as this instrument is chosen for use as the primary instrument for the collection and interpretation of data for identifying and analyzing the organizational culture profiles. Since culture is often regarded as an abstract concept (Cheng 2005), the underlying values of culture are also reviewed in order to gain a better understanding of the more specific concept of “organizational culture”, to help enhance the analysis of the situation pertaining to constructors and builders undertaken.

9.1 **Concepts of Organizational Culture**

There are different understandings of the concept of “organizational culture”, some of which are taken from historical, anthropological or behavioral viewpoints, such as those of Tylor, Boaz and Malinowski, while others perceive “organizational culture” as having a more structural approach and symbolic perspective (Coffey 2010). The following are a sample of some of the definitions of organizational or corporate culture described by different authors and researchers.

A common concept of corporate culture used by many scholars is that of the foundation of corporate character which is visible in the way that its personnel carry out tasks and express their opinions (Denison 1984). Leavitt, Pondy and Boje (1989, 278) to the notion that organizational culture as “the pattern of basic assumptions that a given group has invented, discovered, or developed, in learning to cope with its problems of external adaption and internal integration, that has worked well enough to be considered valid and therefore,
to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.”

By adopting definitions from a number of sources, Coffey (2005, 94) writing specifically about the culture of construction companies, adopts the following definition: “the informal shared values, norms and beliefs that control how individuals and groups in organizations consistently perform tasks, solve problems, resolve conflicts and interact with each other and with others outside the organization.” More recently, Tijhuis and Fellows (2012) define the nature of culture in international construction as not being a matter of concerning particular individuals, but something that relates to and concerns groups of people in which the development of culture spirals through time by shaping behavior which, in turn, shapes culture. In this study, the term “organizational culture” is defined as the shared values and underlying assumptions within the construction organization, which allow the organization to operate effectively.

Focusing on an investigation of the link between organizational culture and effectiveness of an organization, Coffey (2010) provides a list of organizational culture-performance link studies which were conducted by researchers in different parts of the world. From this, it can be concluded that various kinds of organizational culture dimensions have been proven to be connected with short and long-term performance, direct or indirect performance, low and high performance, and growth and profitability of an organization.

9.2 The Competing Values Framework

There are a number of well-established and well-recognized organizational culture models which are used for identifying and measuring organizational culture. One of these models is the Competing Values Framework (CVF), which was developed in 1999 by American researchers Kim S. Cameron and Robert E. Quinn, based on the observations derived from research undertaken by Campbell et al. (1974) and Quinn and Rohrbaugh (1983), of various indicators constituting the criteria that represents a comprehensive set of all possible measures for organizational effectiveness. The CVF is useful as a guide for enhancing organizational effectiveness and facilitating culture change within an organization, with aims of helping organizations to understand themselves and develop an effective organizational environment (Cameron and Quinn 2006).
The CVF has been selected as the conceptual paradigm for analysis in this study, as being the most suitable organizational culture model for use due to its suitability for identifying the profiles or types of organizational culture of construction companies, which generally do not attach much importance to organizational culture. The CVF helps provide an understanding of how sometimes complex phenomenon operate in these companies. In addition, output based on the CVF model is regarded as being compatible with studies pertaining to culture in the construction industries.

The CVF consists of four major culture types (clan, adhocracy, hierarchy, market) that are theorized to compose cultural profiles within various kinds of organizational contexts (Choi et al. 2010). These authors further explain that an organization can possess either a predominant internal or external focus, and may either be wishing to achieve flexibility and discretion, or stability and control. This combination of factors creates four potential cultural categories, each representing a distinct set of cultural values.

![Competing Values Framework](adapted from Cameron and Quinn 2006)

- **CLAN culture**: This is similar to a family-type organization, because people share values, goals, cohesion, participation and individuality. Leaders and employees are bonded by a strong commitment. The strong characteristic of this culture is that all
work is done by the „team“. Customers are seen as partners and human resources development and empowerment are seen as key factors for success.

- **ADOCHRACY culture**: This is very dynamic and entrepreneurial, because people are motivated to be innovative, creative, and risk takers. There is no centralized power or authority relationship. Instead, power flows from people-to-people or from task-team to task-team. Having the most unique and up-to-date products all the time is perceived as being critical for organizational success.

- **MARKET culture**: This is the dominant culture for results-oriented organizations, in which people are pushed to be competitive and productive in a hard-driven and demanding work environment, in which leadership is based on achievement style. “Winning the competition” is the main criteria for being successful.

- **HIERARCHY culture**: This is very typical for government-type organizations. People perform tasks based on formalized procedures under an effective and good coordinator. This culture is typified by a stable and permanent organization, which defines organizational success in terms of efficiency.

From the above explanation on the four types of culture, it is acknowledged that different organizations have diverse working environments, work attitudes and roles, leadership styles, strategies, etc. These are all important when considering the incorporation and implementation of a new management approach such as TQM, because all these factors will determine the degree of success of any TQM related innovations. Companies should, therefore, fully understand their organizational culture profiles and initiate changes if necessary, in order to improve organizational performance in order to gain external recognition and appreciation.

**Applicability of the Competing Values Model:**

Cameron and Quinn (2006) have evaluated the applicability of the competing values model within any organization, with regard to a number factors including organizational leadership and organizational effectiveness. Total Quality Management (TQM) and human resources management roles are each associated with the specific culture in each of the four quadrants of the model. Organizations that consider making adjustments based on a well-developed and robust culture model with specific applicability to their organizational
management practices, will improve their performance, as most will successfully develop cultural values and become more effective.

The first aspect of the CVF that is applicable to organizational behavior is leadership (covering leader type, value drivers and the theory of effectiveness). The second aspect relates to organizational effectiveness, which is reflected in high values in each type of culture. Further, the authors, Cameron and Quinn (2006) have indicated that the CVF can help organizations improve their TQM practices by applying various quality strategies in each culture type, specifically, with reference to the dominant cultures that exist within the company. When conducting research into human resource (HR) management, Ulrich and Brockbank (2005) used the CVF approach to identify the changing roles of the human resource manager. These researchers concluded that the role, means, and competencies required by the HR manager associated with each of the four cultures could foster organizational change and improvement (Cameron and Quinn 2006). These latter authors also state that the framework derived by Ulrich and Brockbank’s (2005) research is a more comprehensive view of HR management than that discussed in much of the literature, because their model is a strategic one for more inclusive and rational HR roles.

Table 9.1 presents the CVF applicability to each type of culture

<table>
<thead>
<tr>
<th>CVF Applicability</th>
<th>CLAN TYPE</th>
<th>ADHOCRACY</th>
<th>MARKET</th>
<th>HIERARCHY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Organisational Leadership</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader Type</td>
<td>Facilitator, Mentor, Team Builder</td>
<td>Innovator, Entrepreneur, Visionary</td>
<td>Hard driver, Competitor, Producer</td>
<td>Coordinator, Monitor, Organizer</td>
</tr>
<tr>
<td>Value Drivers</td>
<td>Commitment, Communication, Development</td>
<td>Innovative outputs, Transformation, Agility</td>
<td>Market share, Goal achievement, Profitability</td>
<td>Efficiency, Timeliness, Consistency and uniformity</td>
</tr>
<tr>
<td>Theory of Effectiveness</td>
<td>Human development and participation produce effectiveness</td>
<td>Innovativeness, vision, and new resources produce effectiveness</td>
<td>Aggressively competing and customer focus produce effectiveness</td>
<td>Control and efficiency with capable processes produce effectiveness</td>
</tr>
<tr>
<td></td>
<td><strong>Organizational Effectiveness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesion, high levels of employees morale and</td>
<td>New products, creative solutions to problem, cutting-edge</td>
<td>Achieving goals, outpacing the competition, increasing market</td>
<td>Efficiency, timeless, smooth functioning, predictability</td>
<td></td>
</tr>
</tbody>
</table>
### Organizational Effectiveness

<table>
<thead>
<tr>
<th>Satisfaction, human resources development, teamwork</th>
<th>Ideas, growth in new markets</th>
<th>Share, acquiring premium levels of financial returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement and participation of employee foster empowerment and commitment</td>
<td>Innovation and new ideas create new market, new customers &amp; new opportunities</td>
<td>Competition creates an impetus for higher levels of productivity</td>
</tr>
<tr>
<td>Control foster efficiency</td>
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</tbody>
</table>

### Total Quality Management

| Empowerment, Team building, Employee involvement, Human resource development, Open communication | Surprise and delight, Creating new standards, Anticipating needs, Continuous improvement, Finding creative solutions | Measuring customer preferences, Improving productivity, Creating external partnerships, Enhancing competitiveness, Involving customers and suppliers | Error detection, Measurement, Process control, Systematic problem solving, Quality tools |

### Human Resource Management Roles

<table>
<thead>
<tr>
<th>Human Resource Role</th>
<th>Human Resource Role</th>
<th>Human Resource Role</th>
<th>Human Resource Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee champion means responding to employee needs</td>
<td>Change agent means facilitating transformation</td>
<td>Strategic business partner means aligning HR with business strategy</td>
<td>Administrative specialist means re-engineering processes</td>
</tr>
<tr>
<td>Morale assessment; Management development; System improvement</td>
<td>Systems analysis; Organizational change skills; Consultation and facilitation</td>
<td>General business skills; Strategic analysis; Strategic leadership</td>
<td>Process improvement; Customer relations; Service needs assessment</td>
</tr>
</tbody>
</table>

### Source: Cameron and Quinn (2006)

In summary, organizational performance can be highly improved by combining the dominant culture profile with the applicability aspects of the CVF: leadership styles, management and employees roles, quality management, and effectiveness criteria (Cameron and Quinn 2006). In relation to this study, the CVF and its applicability are regarded as being beneficial to the research by helping with the development of a framework for TQM implementation, which is specifically referred to in the ISO 9001 standard, in order to develop a culture-based QMS implementation guidance for Indonesian construction companies.
The Organizational Culture Assessment Instrument (OCAI):

In this research, the Organizational Culture Assessment Instrument (OCAI), which was developed in 1999, based on the Competing Values Framework (CVF) model, has been used to identify the current culture profiles of construction companies. This instrument is constructed in the form of a questionnaire that requires individuals to rate a set of statements that relate to six cultural dimensions: dominant characteristics, organizational leadership and management of employees, organizational “glue”, strategic emphasis, and criteria of success. The OCAI assists companies in diagnosing an organization’s cultural type, cultural strength, and cultural congruence (Cameron and Quinn 2006).

Once the culture profile of an organization has been determined, Cameron and Quinn (2006) use the OCAI to provide comparison standards to enable researchers to analyses different culture profiles in depth. The first comparison standard is to identify the dominant type of culture; this is useful for matching this most influential culture with the demands of competitive environment. Secondly, the culture profile is analyzed to establish the degree of strength needed in order to be successful in its environment. The third comparison standard is to identify whether the culture profile is congruent or incongruent. Cultural congruence means that the same culture type is emphasized in various parts of the organization (ibid 2006). The fourth comparison standard is to compare the culture profile with the average culture profiles of other companies/industries that have been surveyed by Cameron and Quinn, to help stimulate additional change in a way that enhances organizational effectiveness. Finally, it is important to use the culture profile to determine operational trends of an organization, to help provide a more comprehensive culture profile.

In construction research on organizational culture profiles, Thomas et al. (2002), Numellin (2006), Liu, Zhang and Leung (2006), Oney-Yazıcı et al. (2007) and Koh and Low (2008) used the OCAI to identify the culture profiles of construction companies in each country of their research domain. They found that the tool is helpful in providing a comprehensive picture of a company’s organizational culture and the values that characterize each culture, as well as providing a comparison standard for culture profile interpretation. The six cultural dimensions of OCAI represent the culture climate in an organization which forms a cumulative representation of an organizational culture.
Table 9.2: The cultural dimensions with associated cultural types of the OCAI

<table>
<thead>
<tr>
<th>Cultural Dimensions</th>
<th>Clan Culture</th>
<th>Adhocracy Culture</th>
<th>Market Culture</th>
<th>Hierarchy Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant Characteristics</td>
<td>It is a very personal place. It is like an extended family. People seem to share a lot of themselves.</td>
<td>It is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.</td>
<td>It is very results-oriented. A major concern is with getting the job done. People are very competitive and achievement-oriented.</td>
<td>It is a very controlled and structured place. Formal procedures generally govern what people do.</td>
</tr>
<tr>
<td>Organizational Leadership</td>
<td>The leader is generally considered to exemplify mentoring, facilitating, and nurturing.</td>
<td>The leader is generally considered to exemplify entrepreneurship, innovation, or risk taking.</td>
<td>The leader is generally considered to exemplify a no-nonsense, aggressive, results-oriented focus.</td>
<td>The leader is generally considered to exemplify coordinating, organizing, or smooth-running efficiency.</td>
</tr>
<tr>
<td>Management of Employees</td>
<td>The management style is characterized by teamwork, consensus, and participation.</td>
<td>The management style is characterized by individual risk taking, innovation, freedom, and uniqueness.</td>
<td>The management style is characterized by hard-driving competitiveness, high demands, and achievement</td>
<td></td>
</tr>
<tr>
<td>Organization Glue</td>
<td>The glue that holds the organization together is loyalty and mutual trust. Commitment to this organization runs high.</td>
<td>The glue that holds the organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge.</td>
<td>The glue that holds the organization together is the emphasis on achievement and goal accomplishment</td>
<td>The glue that holds the organization together is formal rules and policies. Maintaining a smooth-running organization is important.</td>
</tr>
<tr>
<td>Strategic Emphases</td>
<td>It emphasizes human development. High trust, openness, and participation persist.</td>
<td>It emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.</td>
<td>It emphasizes competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant.</td>
<td>It emphasizes permanence and stability. Efficiency, control, and smooth operations are important.</td>
</tr>
</tbody>
</table>
10. **The Culture-based Quality Management System**

Drawing from the understanding that culture addresses people matters, and thus becomes the crucial factor in effective TQM implementation, as well as being the primary determinant for organizations to improve (McCabe 1998), culture-based quality management system is interpreted as meaning a mixture of strong organizational culture and effective TQM implementation. In more concrete terms, this means ensuring that, with recognizable adaptable strong organizational culture profiles, a construction companies’ QMS-ISO 9001 can be efficiently and effectively implemented and continually improved, to provide a strategic management system that improves a company’s performance. The sub-sections below draw on the two aspects of developing culture-based quality management system: (i) the steps of culture change and (ii) details of the relationships between organizational culture and TQM implementation in construction settings.

10.1 **Culture Change**

When conducting the preliminary analysis of questionnaire, most of the local construction companies admitted that they do not have a good understanding of organizational culture, whereas some companies generally realized that their organizational cultures were not well developed or “strong”. The output of the interviews also indicated that there was still a lack of “quality awareness” among both management and workers. A change of attitude is therefore required at all levels for an organization to achieve an understanding of the importance of quality, and so enable individuals to become role models for others. This research has aimed to develop a culture-based QMS improvement implementation framework to guide construction companies in developing and changing their organizational
culture, to impact favorably on their quality practices and procedures incorporated in their QMS, and espoused in their quality values.

Just as for organizational culture, there are many different meanings of the term culture change. Cameron and Quinn (2006) suggested “culture change” is concerned with making real changes in the behavior of people throughout the organization. Trice and Beyer (1993, 395) described culture change as referring to “planned, more encompassing, and more substantial kinds of changes than those which arise spontaneously within cultures or as a part of conscious efforts to keep an existing culture vital. It involves a break with the past and disrupts the cultural continuity; it is an inherently unbalanced process” (ibid 1993). With regard to „culture change“ in the construction organization in order to effectively implement TQM, Low and Teo (2004) point out that the transformation of processes, strategies and beliefs of an organization is needed and this needs to be facilitated by key personnel (McCabe 1998). Yip Robin and Poon (2009) make an additional point that changes in attitudes and practices can be implemented by transforming mind-sets and actions. While Numellin (2006) states that cultural change is not just about adopting new systems and methods, but also requires changes in underlying assumptions and values, hence organizational culture; this does not happen easily.

It is commonly argued that the emphasis on making culture change in construction organizations should be due to pressure both from internal and external factors. Tijhuis and Fellows (2012) have commented that in a competitive business environment especially when entering new markets, there is pressure for culture change. Some corporations initiated organizational cultural changes in response to technological developments, social and political pressures, and tight market competition. This corporation has changed its vision and organizational structure (Susanto 2008).

Strategies for Culture Change

According to Naoum (2011), a strong organizational culture plays an active role to lead construction employees to a higher level of motivation, where the stronger the culture the better the employees’ performance in terms of efficiency and productivity. For a construction company to understand its current culture and then initiate changes in order to develop a “strong” corporate culture, is not an easy task. Sandholm (1999) claims that it might
be difficult for a company to alter its usual habits and behavior to embrace a new quality culture. Supporting this view, Lakhe and Mohanty (1994) conclude that in order to guarantee the successful adoption of TQM principles, there should be a total transformation of the corporate culture, restructuring of management responsibilities and a complete and long-term involvement of all stakeholders for quality process improvement. This means that strategies for strong cultural development and change may be required, to change people’s mindset and behavior within an organization.

Although there are apparent hurdles that must be faced by organizations in changing the status quo and developing cultures that will support TQM, these may well be overcome by applying accurate and appropriate strategies aimed at specific actions leading to cultural change. Therefore, the strategy of change is an important one. Once an organization has established an intention to change its current culture to reflect its wish to adapt and deal with internal and external challenges, according to Cameron and Quinn (2006, 87), there are six potential steps in strategies for organizational culture change. These steps are:

1. Reach a consensus on the current culture in order to foster involvement and to minimize resistance to the culture change by those affected.

2. Reach consensus on the desired future culture, to clarify for all concerned what the new cultural emphases will be.

3. Determine what the changes will and will not mean, to identify what is to remain unaltered in the organization in the midst of change.

4. Identify illustrative stories.

5. Develop a strategic action plan.

6. Develop an implementation plan to generate specific action steps that can be initiated to create momentum toward culture change.

The strategy for culture change must be well planned, in order to minimize the chance of failure. According to Susanto (2008), one of the causes of organizational change failure is because of a lack of strong consensus with the organizational leaders as to what is to be changed and how. If members of organizations feel that the proposed changes will cause
any pressure, then resistance can sometimes be manifest in the form of sabotage, reduced productivity and reduced motivation (Low and Teo 2004). Based on the researcher’s own experience as the Quality Manager of an ISO 9001 certified educational institution, management and staff, while acknowledging that ISO 9001 certification must be retained, do not always positively respond to sincere strategies for its implementation or any related action plan to retain it. Yip, Robin and Poon (2009) emphasize that the culture in construction companies needs to be a sustainable one, and this can only be achieved by making changes over time in response social demands for sustainability, and global tendencies in sustainable construction development. Therefore, any proposed steps for culture change need to be included in the culture-based TQM framework design, to identify what current organizational culture profiles are currently in place that can lead management towards designing its own strategy for culture development and change, in order to reach a desired quality culture.

10.2 Relationship between Organizational Culture and Total Quality Management System Practices in Construction Companies

A number of studies have been undertaken analyzing how a quality system can be successfully implemented and in identifying the potential benefits to be gained by a construction organization that achieves effective implementation of such systems. Corbet and Rastrick (2000), Irani, Beskese and Love (2004), Coffey (2005), Coffey (2010) agree that there is a definite relationship between corporate culture and quality in construction projects. It has also been noted that the nature of the culture is a major determinant factor for such success, and this, in turn, is related to the successful implementation of a TQM. Koh and Low (2008) have referred to this relationship as “mutually reinforcing” and by this they mean that if the corporate culture is good, the quality system will be applied appropriately, with the resulting products and services also being good.

Organizational practices ingrained in the forms of organizational structure, processes, methods and procedures, must be constantly constructed and managed in order to make an effective organization (Nadler and Tushman 1980). Building up the concept of organizational culture within an organization influences quality management practices and vice versa (Noronha 2002), and all the organizational practices must be in a state of
congruence for good quality practices to operate (Koh and Low 2008). This implies, for example, that if the management applies a new approach that focuses on internalizing quality values [which are part of organization’s culture] in all organizational members, then the organizational culture creates an organizational climate which supports quality improvement and/or also grows the quality climate; this, in turn, directs the quality management processes [and implementation] that achieve quality results (ibid 2002).

Construction companies should undertake a preliminary review of their internal culture before attempting to introduce TQM. Irani, Beskese and Love (2004) suggest that construction firms should examine whether they possess core values that focus on customer satisfaction and retention of such values, before turning to TQM. Although it is recognized that cultural values differ among organizations, the authors state that the basic beliefs in business competition, and the desire to have an efficient operational budget, should be common to all companies (ibid 2004). These points are useful when considering of appropriate culture type, dimensions and strength that a construction company needs to possess or develop, in order to have a chance in gaining customer’s satisfaction, engage in effective management functions, and therefore achieve business excellence.

Koh and Low (2008) appear to have established the links between corporate culture models and strategies for TQM practices. They have proposed that organizations should continuously adjust their corporate cultural values using transparent and open-minded vision, thereby placing themselves in a group of similar strong culture organizations. The companies then need to bring these strong cultural traits into their TQM strategies, as the two need to be incorporated simultaneously.

Using the Organizational Culture Assessment Instrument (OCAI), Koh and Low (2008) conducted an assessment of some construction companies, and analyzed how their cultures related to the implementation of the eight elements of TQM. From their survey findings, four organizational culture types were identified - strong comprehensive, clan-driven, hierarchy-driven and weak comprehensive culture.
They conclude that there are two major strategies:

“(1) modification of organizational culture in response to the diagnosis on weak cultural aspects that require fortification; and

(2) Adaptation of TQM practices to better suit the prevailing organizational culture so that quick results can be attained.”

Looking more deeply into the specific factors of the relationship, earlier research findings have revealed that the link between corporate culture and effective QMS or TQM implementation in construction organizations is related to several common but important management traits. These include: (1) process management; (2) leadership and management commitment; and (3) staff empowerment and effective communication.

**Process management**: The processes that exist in any organization reflect their day-to-day set of activities, and therefore, quality work outcomes are a result of consistent and regular quality management processes and their control. Zhang, Waszink and Wijngaard (2000) have emphasized that process management is the key element in guaranteeing project results that conform to specified requirements. In support of this view, Mahmood et al. (2006) point out...
that if all organization’s activities are directed to TQM initiatives in order to achieve overall quality performance, then process management appears to be an essential requirement for quality of conformance. However, QMS supports the operation of the processes which is an organization itself, has the mandate to design and is free to determine the type and extent of quality documentation it references for its process approach (Watson and Howarth 2011). Therefore, the corporate culture needs to be embedded in a project’s process management through the establishment of top-driven and high-quality project objectives, combined with a desire to satisfy customers by meeting and even exceeding their requirements.

**Leadership and Management Commitment:** In the review of barriers in implementing TQM, it is noted that the role of leadership in TQM implementation is critical. McAdam and Kelly (2002) claim that, to successfully implement TQM requires effort by all sections within an organization. However, it is often pointed out that all levels of management have a major responsibility in leading and assisting their members to properly establish the QMS. In addition, Ahmed et al. (2005), Everett (2002) note that, the success of any quality system can be achieved even if there is nothing but a strong commitment to improving quality, and guidance from management on their expectations and requirements for quality in order to value customers. This means that management has responsibility for creating a comfortable workplace atmosphere that helps employees in delivering productive project results (Leiter and Maslach 2002; Mahmood et al. 2006). Hence, the essence of a company’s corporate culture reveals the quality management styles of an organization from top to middle management levels, with top management’s motivation within an organization playing a key role in improving quality (Lo 2002).

Many styles of leadership in construction have also been researched. It has been noted that top leadership and project manager leadership styles are closely associated with effective outcomes for better construction firm work settings. Muller and Turner (2007) indicate that the project manager’s leadership style influences project success, and different leadership styles are appropriate for different types of projects. Toor and Ofori (2008) and Mahmood and Mohammed (2008) argue that authentic leadership must be embedded in the organizational culture to maximize positive outcomes and achieve a factual organizational performance. Ozorovskaja, Voordijk and Wilderom (2007) have examined the practice of transformational and transactional leadership in Dutch and Lithuanian construction
companies, in an effort to get more trustful, productive, and committed employees. The important role of leadership in the construction industry, with the influence of organization’s culture, according to Tijhuis (2010), can make construction more innovative, as long as the central management is seriously involved with decision making and communication in a professional manner.

Specifically in relation to the construction project culture, Pamulu and Husni (2005) have observed that by measuring cultural values in sample companies, they can understand how different aspects of culture affect the use of ISO 9001 to varying degrees, and from their studies, leadership has the highest impact. This means that leadership, which reflects management commitment and involvement, is the most important value in quality management system application. Management commitment, according to clause 5.1 of ISO 9001, states that management has to “develop, control, co-ordinate, supervise and monitor their corporate quality policy and ensure that this policy is understood and maintained throughout the organization”.

Staff Empowerment and Effective Communication: According to Reeves and Bednar (1994) the performance of management and staff in all work stages, including the production of quality outcomes, reflects the prevalent type of company culture that exists. An appropriate corporate culture also enhances a harmonic internal relationship amongst management and staff, so that communication between them runs smoothly (Karathanos 1998). This is highlighted in clause 5.5.3 of the ISO 9001, which notes that internal communication needs to take place to improve the effectiveness of the quality management system implementation. In addition, Irani, Beskese and Love (2004) have observed that good corporate cultures will motivate staff to produce valuable outcomes, as they know exactly what they must do. This is reflected in staff maintaining a positive perspective, even when there is a transformation in the organization, thereby leading to employee recognition and rewards (Mahmood and Mohammed 2008). Sai, Wong and Wu (2011) also note that goal settings and accomplishment, team orientation, coordination and integration, performance emphasis, innovation orientation, member participation and reward orientation, are significant organizational culture factors in the construction industry that help provide an organization with an identity. From these perspectives, it can be seen that corporate human resources are an important factor to be considered in the broader picture of successful TQM
implementation, as the cultural values of an organization are inspired in the minds and attitudes of organizational players and actualize them in a quality manner with a full understanding of their responsibilities.

10.3 Construction Organization Performance Measurement

The fact that the effective implementation of QMS-ISO 9001 in the construction companies’ benefits either the internal management and operational systems of the companies, through the improvement of quality awareness and understanding, and therefore, the quality of services and product delivery, or the satisfaction of external parties involved in the services and product provided by the companies, including the end-users of the construction, indeed the overall benefit is an important for the companies’ business performance improvement.

Although there are many potential criteria, which might be measured to assess construction companies’ performance and achievements, the notion that construction companies’ performance is measured in terms of business or financial performance is still critical. Research on the links between qualities by ISO 9001 certified companies and financial performance in various industries, has found contradictory results. ISO 9001 certified companies, in addition to improving their operational efficiency, also have improvements in their financial performance (Cow-Chua, Goh and Tan 2003; Sharma 2005; Haupt and Whiteman 2004). Marín and Ruiz-Ollalla (2011) also researched this issue and found that there was a positive relationship between ISO 9001 quality certification and business results. However, not all companies that become ISO 9001 certified show financial performance benefits. In the construction research area itself, studies on the effects of ISO 9001 implementation on the certified companies’ business performance are still limited.

However, there is no single performance measurement system that fits the construction industry. It is therefore, an important task for every construction company in individual countries, to develop a comprehensive performance measurement that can help the construction industry to measure its existing performance, and then decide which performance criteria need to be more improved for the future continuity of company’s business life. The quality of the construction process and the level of customer satisfaction derived from it, need to be operationalized to form a quality performance assessment system.
(Yasamis, Arditi and Mohammadi 2002), to provide a definite basis for performance measurement, as required from ISO 9001 certified companies. It’s also noted that client satisfaction is one of the most important criteria for measuring construction company performance.

As outlined in the review of the relationships between organizational culture and construction companies’ effective performance, a strong organizational culture helps ensuring that an organization operate effectively and give identity to the organization, as well as supporting QMS-ISO 9001 implementation, ensures that future projects are more marketable and repeat business ensured. This is also reflected in the relationship between a strong organizational culture and an effective QMS or TQM implementation, in reference to their impact on the organizational effectiveness and a high level of successful performance, although there is still relatively limited research on these links.

Earlier studies on the links between organizational culture and organizational performance show the positive relationships between these two parameters. According to Denison and Mishra (1995), organizational culture can be measured and is a trigger for organizational outcomes. They proposed four parameters as a measure of organizational culture (adaptability, mission, involvement, and consistency) within the context of company performance, with comparisons between similar companies being made within the context of profitability, quality, return on assets, sales growth, employee’s satisfaction, and overall performance. There is a significant correlation between the strength of an organization’s culture and its comparative effectiveness in performance. The link, in turn, highlights the importance of organizational culture to an effective QMS implementation in ensuring an overall high level of company performance in both the immediate and longer term.

The importance of national culture to, and relationships with, quality management practices and effectiveness is not well documented in the literature. However, case studies of ISO 9001 and TQM companies operating in mainland China, Hong Kong and Taiwan, found that Chinese cultural values have an important influence on an organization’s quality climate, processes, methods and results. More recently, Kull and Wacker (2010), in a survey-based study of manufacturing industries have found that differences in quality management effectiveness exist among the East Asian cultures of China, South Korea, and Taiwan.
By undertaking the review on the construction performance measurement system, in particular the performance of the ISO 9001 certified contractors, and the linkages between organizational culture and organization effective performance, it’s needed to develop key performance indicators (KPIs) for ISO 9001 certified construction companies, in order to measure their performance in response to the implementation of TQM.

**10.4 TQM Critical Success Factors for Construction firms**

**10.4.1 Top management commitment:**

Research suggests that most quality tools associated with TQM do not generally produce an advantage, but a certain tacit behavioral feature such as executive commitment can produce an advantage. Many a time TQM initiatives have failed to fulfil their potential due to lack of senior management commitment to the quality process. Thus, for TQM, commitment by the management is essential. Without it; there is no need to proceed further.

**10.4.2 Quality culture:**

The factors like use of information for improvement, authority equal to responsibility, job security, climate of fairness, compensation based on equality, teamwork, collaboration, learning and involvement, ownership, and development form an organizational culture, which then leads to increases in productivity, quality, and customer and employee satisfaction. Failure of the TQM is attributed to a lack of developing and sustaining a quality oriented culture and mismatch of organizational culture. In a sense, TQM fundamentally requires a new culture. In the construction industry, company culture and project culture both co-exist and need integration.

**10.4.3 Strategic quality management:**

Strategic quality management concepts must be put into practice by the inclusion of quality objectives in the strategic planning process and through strategic planning frameworks, like quality function deployment (QFD), which provides specific instructions for approaching, executing, and evaluating the development of strategic concepts. Internal issues develop a long-term road map with the incorporation of core competencies concepts and emphasize the adoption of new technologies. External issues are the response of the
organization to the economic swings in the industry, the impact of new market opportunities on existing business practices and protection against competitors.

10.4.4 Design quality management:

Superior designs result in distinct competitive capabilities such as fast delivery and flexibility. In construction projects, new designs are thoroughly reviewed before construction and experimental design is used extensively in structure design. Clarity of specifications and avoidance of frequent redesigns is emphasized. Detail design, schedule and cost estimate, design evaluations, constructability in design, control of design activity are part of design quality management. Thus good design quality management results in an excellent quality of core service that positively influences customer perceptions of quality and an important aspect of TQM.

10.4.5 Process management:

Process management focuses on managing the construction process so that it operates as expected, without breakdowns, shortage/missing materials, tools, etc. It is needed to reduce rework and waste due to mis-specification of processing parameters. This provides clarity of ownership and less reliance on inspection. In the context of construction, specific activities like planning the sequence of field tasks, analysis of layout, access, temporary facilities, innovative use of materials, innovative use of construction equipment and tools, and the use of pre-assembly or pre-fabrication items are carried out. Also, constructability is included in the contract document. Pre-work, demobilization, execution are a part of process management.

10.4.6 Supplier quality management:

Supplier quality management includes fewer dependable subcontractors, reliance on suppliers process control, strong inter dependence of supplier and customer, purchasing policy, emphasizing quality rather than price, supplier quality control and supplier assistance in quality development. Materials are often a major source of quality problems and affect buyer satisfaction. Instead of relying on tools such as acceptance sampling to establish the quality of incoming materials and component parts, it is preferable for constructors to purchase from a more limited number of qualified or certified suppliers.
10.4.7 Education and training:

Education and training forces employees to not only possess the adequate knowledge and skills to perform their jobs, but also to possess specific values, knowledge, and skills associated with TQM issues and activities. Reasons cited for the failure of TQM initiative include the lack of appropriate training and inadequate knowledge. Thus employees will be motivated to engage in quality-oriented behavior when their roles and the relevance of their training to overall quality goals are clarified.

10.4.8 Empowerment and involvement:

Empowerment and involvement enhances the individual's self-esteem and improves his/her ability to solve problems and to make low-risk decisions. Worker motivation, responsibility, and accountability are generic concepts that can benefit any business organization. The causes of ongoing quality problems like lack of team work, conflict, and lack of worker involvement are overcome by personally participating in quality improvement activities, which leads to the success of TQM.

10.4.9 Information and analysis:

Information and analysis consist of evaluation for various policies and strategies, quality audit, analysis of quality costs, department/function performance evaluation, and employee and supplier performance evaluation. If there is inferior dissemination of the generated information, quality techniques like benchmarking and SPC tools will be rendered ineffective. To maintain a true customer focus, an organization must ensure prompt feedback of customer survey results to appropriate functional areas for effective actions.

10.4.10 Customer satisfaction:

A construction organization may outperform the competition by being able to anticipate and respond quickly to customers’ demands with new ideas and technologies and to produce constructed facilities that satisfy or exceed customers’ expectations. Despite the use of the latest process improvement techniques and capable management, a firm's neglect of its customers may lead to disaster. Without customer focus, the TQM programme will lack the foundations on which to build further.
10.5 Recommendations for suitable organizational culture and performance

Some recommendations outlined here may have been more appropriate to be applied on the organizational culture of construction industries to support TQM. Based on the study of construction companies, the following recommendations can be emphasized for construction industry to improve organizational performance.

- Allocating a percentage of the profits of the company's for training and education programs.
- Establishing a team from inside or outside the company for training and education of employees and to work out special programs to deal with the requirements of design changes.
- Devote at least 4 hours a month for education and training.
- Making lists graded of rewards (for bonuses and incentives).
- Give more freedom for employees to make decisions on their jobs and should be encouraged to propose solutions for problems which arise during work.
- Adopt a policy of product quality for the formation of long-term relationships with suppliers.
- Administration's choice should be done through efficient and effective mechanisms proposals.
- Organize training course for top management in TQM concepts.
- Top management must participate in quality management activities.

There is great potential for quality improvement in the construction industry. In today's competitive world, the term 'quality' and its concepts are vital for the construction industry. There is not much time nor resources to waste. Reworks and delays are not acceptable. As in the manufacturing industries, the construction industry should focus on process quality. It is clear that TQM and its principles do apply to the construction industry. TQM philosophy of teamwork and co-operation not confrontation and conflict, is long overdue for the construction industry.

This study indicates that future strategies and potential developments should be based on the following findings. Project managers and company administrators should consider the following points in developing their quality systems.
Management commitment to quality and to continuous quality improvement is very important in each phase of the building process. Management must participate in the implementation process and be fully committed to it if TQM is to succeed.

Construction industry professionals are aware of the importance of quality training. Engineering, architecture and construction management students who eventually become the industry's future leaders must be instructed in the basics of quality management. Education and training in TQM theory and practice at all levels (management as well as operative levels) and in all phases (design, construction, and operation phases) are essential to enhance competitiveness.

Teamwork is necessary to allow each person to get the assistance required to be successful individually, and collectively as a team. The whole construction industry is project oriented; so improved quality performance must be project-related and must include the whole project team. Manufacturer, subcontractors, main contractor, vendors, professional designers, project managers and above all, the owner must be involved in the process. Partnering arrangements between these parties will enhance total quality.

Statistical methods are essential problem solving tools and are very important in monitoring quality in manufacturing industries. But they are not perceived as very useful by construction professionals; yet, there appears to be potential for a feedback system in the construction process. As the project is being completed, feedback loops originating at the end of each phase could be used to upgrade the original quality standards adopted at the beginning of the project.

Taking measures to achieve high quality cost money. This cost should not be considered an expense but an investment. Construction organizations that achieve reputation for high quality can maximize their competitiveness and increase their business opportunities.

The construction project should be considered as a process where all customers must be satisfied. These customers include internal customers (employees, units, departments within an organization) and external customers (owner, designer, contractor, etc.).

The requirements of the owner must be clearly defined at the beginning of the project and be agreed to by both the owner and design firm. The more time and effort are
spent at the beginning in defining requirements, the more smoothly the project will progress. Objective setting is important because it provides a focus for scope definition, guides the design process, controls the construction process, and influences the motivation of the project team.

- Drawings and specifications received from the designer affect the quality of the construction. Drawings are the only documents given to the constructor that show the design concept, size and scope of the job. It is critical that drawings and specifications be clear, concise, and uniform. The project must be constructible by those retained to build the project. Design professionals must be familiar with construction materials and techniques that constructors will be using in the project.
11. Conclusions

This paper reviews the literature related to TQMs, in a global context and reviews the basis of the relationships that have increasingly been shown to exist between contractor’s organizational culture and the practice of TQM in construction companies.

It’s clear that the successful implementation of a TQM, particularly if certified under a formal international standard such as ISO 9001, requires a total change in organizational culture which involves leadership styles, management and staff commitments, improved organizational effectiveness, process management, staff empowerment and effective communication. The change from an organization’s current culture to a new quality culture must become focused on achieving greater customer satisfaction, together with meeting internal organizational needs. These two concepts, the TQM and the organizational culture, are mutually bound, and a failure in the commitment to a strong quality culture will result in unsuccessful TQM implementation and vice versa.

To date, there have been few studies on how and why the organizational culture of construction companies is important in achieving an improvement in the quality of project performance globally. This research was therefore been focused on the study of these issues from an organizational culture perspective, including the type and strength of the company’s culture, as well as their roles in the TQM processes and practices, as a means to direct organizations towards more successful quality outcomes, following the implementation of TQM. Main limitation in this research was the analysis of organizations from different countries with different and specific national cultures, different legal guidelines, and different political and business environments, which might influence an organization’s culture. Even though, the study could overcome the barriers by examining the conditions effectively.

A number of caveats were inserted with the overall mood of optimism in TQM’s future credibility in construction industries. TQM must remain focused on organizational practice and business goals, not only operational but also strategic. Hence, the future research should therefore cover the measurement of the preferred future culture profiles within large-scale construction companies, to meet their perceived needs relating to internal developments and the future business environment, including challenges and opportunities to be faced by the companies.
12. Bibliography

3. Prajogo, I., Daniel and Sohal S. Amrik, 2006. The relationship between organization strategy, total quality management (TQM) and organization performance-the mediating role of TQM.
12. Website references:
   http://www.researchgate.net/publication/222471034_Total_quality_management_in_the_construction_process
   https://www.construction-institute.org/scriptcontent/more/sd74_more.cfm
Annexure

Questionnaire:

**Impact of organizational culture on total quality management in construction industries**

**AIM**

The aims of this survey are:

1. To investigate the current status of quality management system implementation in construction companies
2. To identify organizational culture profiles of construction companies.
3. To find out the relationship between organizational culture and quality management.

**CONFIDENTIALITY**

All information provided in this survey will be treated as strictly confidential, no companies or individuals will be identified in any subsequent research report, and all information collected will be used purely for the academic purposes.

**FEEDBACK OF RESULTS**

After all surveys are collected and analyzed, feedback on the overall research results will be provided upon request to interested respondents in this study.

**CONTACT DETAILS**

If you have any questions regarding this survey, please do not hesitate to contact:

Jince George on +39 3384361689 or e-mail: jince.george@mail.polimi.it
Please kindly respond to the following questions by ticking (v) the appropriate box, circling the appropriate figure, or writing your answer in the space provided.

**Position of Respondent**

<table>
<thead>
<tr>
<th>Role</th>
<th>Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Manager/Quality Management Representative</td>
<td></td>
</tr>
<tr>
<td>Project Manager</td>
<td></td>
</tr>
<tr>
<td>Purchasing Manager</td>
<td></td>
</tr>
<tr>
<td>Logistics Manager</td>
<td></td>
</tr>
<tr>
<td>Maintenance Manager</td>
<td></td>
</tr>
<tr>
<td>Finance Manager</td>
<td></td>
</tr>
<tr>
<td>Site Engineer</td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
</tr>
</tbody>
</table>

How long have you been employed by the company?

- [ ] <5 years
- [ ] 5 – 10 years
- [ ] 11 – 15 years
- [ ] 16 – 20 years
- [ ] >20 years

**The Company Details**

<table>
<thead>
<tr>
<th>Detail</th>
<th>Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of contractor</td>
<td>[ ] Building</td>
</tr>
<tr>
<td></td>
<td>[ ] Civil</td>
</tr>
<tr>
<td></td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>Type of company</td>
<td>[ ] Public Ownership</td>
</tr>
<tr>
<td></td>
<td>[ ] Foreign Ownership</td>
</tr>
<tr>
<td></td>
<td>[ ] National Private Company</td>
</tr>
<tr>
<td>How long has the organization been</td>
<td></td>
</tr>
<tr>
<td>operating?</td>
<td></td>
</tr>
<tr>
<td>No. of employees</td>
<td></td>
</tr>
<tr>
<td>City of main operation</td>
<td></td>
</tr>
<tr>
<td>Major customer sector</td>
<td>[ ] Government</td>
</tr>
<tr>
<td></td>
<td>[ ] Private</td>
</tr>
<tr>
<td></td>
<td>[ ] Foreign</td>
</tr>
</tbody>
</table>
Section II – Questions related to the development stage of QMS

2.1 Did your company employ consultants to assist in setting up the QMS?

☐ Yes  ☐ No (please go to 2.2)

IF YES

What is your opinion of the consultants’ role?

☐ Very helpful  ☐ Helpful  ☐ Fairly helpful  ☐ Not helpful

What percentage of involvement did the consultants have in the establishment of the company’s QMS documentation (e.g. Quality Manual, Quality Procedures and Project Quality Plan)?

☐ < 25%  ☐ 25 – 50%  ☐ 51 – 75%  ☐ 76 – 100%

2.2 How was the fundamental QMS documentation (e.g. Quality Manual, Quality Procedures etc.) generally developed?

☐ Every division/sub-division prepared the draft of the documents
☐ Quality Assurance Team developed the documents
☐ The consultant developed the documents
☐ Quality Assurance Team and the consultant developed the documents

2.3 Please rank order, from 1 (most) to 8 (least), the motives you find important for the company to develop a QMS certified.

Motives for developing QMS

- To effectively and efficiently control project activities
- To minimize poor quality of construction processes and products
- To enter the international construction market
- For the betterment of the company’s overall management system
- As a requirement of the Ministry of Public Works
- To fulfill clients’ requests as part of the bidding process
- To improve the company’s prestige (e.g. image, reputation)
- To improve business performance
Section III – Questions related to the practice of QM principles

3. Based on your experience, rate the level of implementation of each major principle of QM standards in your company.

4 = fully implemented  
3 = Not so fully implemented  
2 = minimally implemented  
1 = yet to be implemented

<table>
<thead>
<tr>
<th>The eight major QM principles</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 The company focuses on customer requirements and expectations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 The leaders establish unity of purpose and direction of the company.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 Employees are fully involved and their abilities are empowered for the company’s benefit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4 Project activities and related resources are managed as a process.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5 The company identifies, understands, and manages interrelated processes as a system.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6 The company has a strategic objective for permanent and continuous improvement of overall performance.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.7 Decision-making is based on an analysis of relevant data and information.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.8 The company and its suppliers have a mutually beneficial relationship.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section IV – Questions related to the practice of QM elements

4. Based on your experience, please give your score in the appropriate box which indicates the level of implementation of QM elements in your company.

4 = fully implemented  
3 = Not so fully implemented  
2 = minimally implemented  
1 = yet to be implemented

<table>
<thead>
<tr>
<th>The QM elements</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Management sets the company quality policy and implements it by providing resources and training.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2 A Quality Manual and supporting procedures have been created and are maintained.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3 Contracts reflect customers’ needs and expectations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.4 Design changes are carefully documented to ensure that they become fully coordinated and are approved internally and by clients.

4.5 Creation and modification of any quality documentation is strictly controlled by established procedures.

4.6 Purchasing procedures fully describe supplier requirements and there is a formal system for ensuring compliance to these standards.

4.7 Procedures detail methods of handling and safekeeping of product supplied by clients.

4.8 Methods of tracking the dates and lot-codes of products and raw materials, from arrival on site to incorporation into construction, guarantee traceability.

4.9 Work instructions, quality plans and workmanship standards, verify that each job is being done correctly.

4.10 Inspection and testing at receiving, in-process and final inspection areas ensure quality compliance. Test and inspection records are retained and preserved as part of the quality documentation system.

4.11 Instruments and measuring tools are calibrated regularly, and records maintained.

4.12 Only inspected materials may be used or processed further. Inspected product is always identified.

4.13 Materials or products that fail to meet specifications are rejected and separated from normal production. Only the proper authorities may decide if rejected material will be used as is, reworked or returned to the supplier.

4.14 The corrective action system focuses on identifying the root causes of quality concerns and any corrective and preventative actions required.

4.15 Procedures outline practices that protect products from damage during construction and delivery.

4.16 Quality records provide an audit trail for internal and external auditors.

4.17 Trained teams verify that the company Quality System is working, by evaluating whether the QM requirements examined by the external auditors, are being met on an on-going basis.
### Section V – Questions related to the problems of QMS implementation

5. The following statements are related to problems that companies mostly faces in relation to effective QM implementation.

<table>
<thead>
<tr>
<th>4 = Often experienced</th>
<th>3 = Sometimes experienced</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 = Very seldom experienced</td>
<td>1 = Not experienced</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Difficulty in the process of attaining QMS</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Management attitudes and purposes appear solely focused on marketing effort or are solely due to imposed customer requirements, resulting in a QMS that often lacks any internally driven improvement component.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2 Top management considers compliance to QM a documentation task rather than the opportunity to change to an improved and systematic management style. Consequently, a Quality Manager is appointed without authority to make any real changes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.3 Lack of corporate commitment and inconsistency of management action and decision-making.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.4 Lack of strong motivation from all levels of management.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5.5 Lack of effective management response to settle staff grievances and needs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.6 Difficulty in understanding QM terminology in order to integrate fully into company’s operating procedures.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.7 Management and staff complete their activity reports ‘at the last minute’, prior to the conduction of an internal and/or external audit. Management and staff perceive QMS as just a matter of fulfilling the internal and/or external audit requirements.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.8 Failure in disseminating the requirements of the company’s QMS to all organizational levels.

5.9 Lack of a well-designed reward system to motivate employees to espouse the QMS values, such as training, development and promotion, and/or a financial bonus.

5.10 Internal communication processes between management and staff, and amongst staff, are not always well defined and lead to misunderstandings.

5.11 Poor external communication exists (e.g. with subcontractors and clients) and contributes to poor quality outcomes.

5.12 Uncertainty exists with the effectiveness and/or suitability of subcontractors and suppliers quality systems.

5.13 There is resistance to implementation of QMS amongst staff.

5.14 Lack of identified funding in the company for implementing QMS.

Section VI – Questions related to the company’s organizational culture

6. The following statements are used to assess the company’s organizational culture. Please allocate a score (0 – 100) next to the corresponding statement to indicate in your view the degree of correctness.

The highest score is given to the statement completely true describing the current organizational culture of your company, followed by somewhat true, etc., while the lowest points indicate never true. The total points score for each item should add up to 100.

<table>
<thead>
<tr>
<th>The organization is a very:</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Personal place. It is like an extended family. People seem to share a lot of themselves.</td>
<td></td>
</tr>
<tr>
<td>B Dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.</td>
<td></td>
</tr>
<tr>
<td>C Results-oriented. A major concern is with getting the job done. People are very competitive and achievement-oriented.</td>
<td></td>
</tr>
<tr>
<td>D Controlled and structured place. Formal procedures generally govern what people do.</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
### 6.2 The leadership in the organization is generally considered to exemplify:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Mentoring, facilitating, and nurturing.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Entrepreneurship, innovation, or risk taking.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>A no-nonsense, aggressive, results-oriented focus.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Coordinating, organizing, or smooth-running efficiency.</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

### 6.3 The management style in the organization is characterized by:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Teamwork, consensus, and participation.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Individual risk taking, innovation, freedom, and uniqueness.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Hard-driving competitiveness, high demands, and achievement.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Security employment, conformity, predictability, and stability in relationships.</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

### 6.4 The glue that holds the organization together is:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Loyalty and mutual trust. Commitment to this organization runs high.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Commitment to innovation and development. There is an emphasis on being on the cutting edge.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>The emphasis on achievement and goal accomplishment.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Formal rules and policies. Maintaining a smooth-running organization is important.</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

### 6.5 The organization emphasizes:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Human development. High trust, openness, and participation persist.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Permanence and stability. Efficiency, control, and smooth operations are important.</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

### 6.6 The organization defines success on the basis of:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The development of human resources, teamwork, employee commitment, and concern for people.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Having the most unique or newest products. It is a product leader and innovator.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Winning in the marketplace and outpacing the competition. Competitive market leadership is key.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Efficiency. Dependable delivery, smooth scheduling, and low-cost production are critical.</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Section VII – Questions related to organization performance during implementing QMS

7. The following statements indicate several key performance indicators (KPIs) of a construction organization. How would you assess your organizational performance, particularly after implementing a QMS? Please respond to each statement by putting the score in appropriate box.

<table>
<thead>
<tr>
<th>Organization performance</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Profitability for the preceding two years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.2 Sales growth for the preceding two years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.3 Market share in your region for the most recent year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.4 Global market contracts acquired</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5 Quality of services and products</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.6 Sustainable construction products</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.7 New product innovation and development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.8 Generating employee satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*** Thank you very much for your participation in this survey ***