CHAPTER II

LITERATURE REVIEW

2.1 Introduction

In ensuring that products (goods and services) have possesed the quality in which they have been designed for, a strategy to achieve quality throughout an organization is certainly required. Such quality management approach throughout the entire organization has evolved into *Quality Management System* (QMS), a complementary system to other systems and functions in a company which is not as much of a philosophy in TQM to other systems and functions in a company. It is a systematic approach to achieving quality and customer satisfaction. QMS tends to particularly more focus on individual projects that have a quantifiable impact, i.e., increased profitability. Many companies around the world have evolved out of the ISO certification process and have adopted the *Malcolm Baldrige National Quality Award* (MBNQA) as their QMS. Another well known QMS is *Six Sigma* (Russell and Taylor, 2008).

QMS to a large extent has replaced TQM, a philosophy of an organization management centered on quality and customer satisfaction as a strategy to achieve long-term success. Regardless of the term, a company applies it to monitor the process in achieving quality improvement, and the possible differences between TQM and QMS. There are several certain common characteristics of company-wide approach to quality improvement, such as the active involvement, participation and cooperation of individual in an organization, and virtually encompassing all of its activities and processes. To achieve and sustain this pervasive focus on quality, it apparently requires a significant long-term commitment on

the part of the organization's leadership. TQM requires an organizational transformation—a totally new and different way of thinking and behaving (Russell and Taylor, 2008) and has been the most prominent and visible approach to quality to evolve from the work of Deming and the early quality gurus. Originated in the 1980s as a Japanese style management approach to quality improvement, TQM became very popular during the 1990s, and mostly adopted by many companies (Russell and Taylor, 2008). Knowing the history of TQM presumably becomes a way to understand its implementations.

In the mid 1940s, *Statistical Process Control* (SPC) was initially developed by W. Edward Deming, an advisor in sampling at the Bureau of Census and later becoming a professor of statistics at the New York University Graduate School of Business Administration. His attempt to convince American businesses to adopt TQM was not as successful as his attempt in Japan. After World War II, General McArthur took 200 scientists and specialists, including Deming, to Japan to rebuild the country. Deming, while working at the Japanese Census, was invited by the *Japanese Union of Scientists and Engineers* (JUSE) to give lectures about his statistical quality techniques. One of the attendees was a past professor to many of Japan's CEOs who, after attending the lectures, told his CEO students that if they wanted to turn Japan's economy around within five years, they should attend Deming's lectures on using statistics to achieve quality at a reduced cost. Following this, many of the CEOs took the professor's advice by attending the lectures. Eventually, many Japanese manufacturing companies adopting Deming's theories were able to produce quality products at reduced costs (Gitlow *et al*., 2005).

In this study the researcher focuses largely on the ideas of Deming, one of several quality gurus in United States such as Juran, Crosby, and Feigenbaum. It is not only because of

Deming was the most prominent among other quality experts but also because his approach to quality management advocates a continuous improvement of the production/operations process to achieve conformance to specifications and reduce variability. Deming emphasizes that the primary responsibility for quality improvement lies on the employees and management. He also promotes an extensive employee involvement in a quality improvement program, and recommends training for workers in quality-control techniques and methods (Russell and Taylor, 2008).

While the business world in Japan was concentrated on the product quality, businesses in the United States in contrast were more concerned with a large quantity of products. This condition then enabled Japan, with their inexpensive and high qualified products; to gain a substantial foothold in American markets. Following this condition, in the 1970s and 1980s, many American companies, including Ford, IBM, and Xerox, began to adopt Deming's principles of TQM. This, as a result, gradually led America to regain some of the markets previously lost to the Japanese.

Although TQM gained its prominence in the private sector, it in the 1990s had also been adopted by some public organizations (Gitlow *et al*., 2005). Motorola in the mid-1980s, for instance, introduced *Six Sigma* management, a style of quality management system that endeavors to improve or innovate processes to reduce the number of defects not more than 4.4 per million to affect the bottom-line results of an organization. In 1987, the ISO 9000 series quality standards were also published and spread worldwide promoting a standardization of activities within an organization for governing QMS. In 1986, ANSI (*American National Standards Institute*) and ASQC (*American Society for Quality Control*) similarly announced the ANSI/ASQC Q90 Series of standards - the technical equivalents of

the ISO 9000 series standards. The MBNQA then was established in the United States in 1988 by the *Malcolm Baldrige National Quality Improvement Act* of 1987 (Gitlow *et al*., 2005).

The period between 1990s and 2000s has been considered as a booming of interest in quality management, especially for the core ideas of TQM commonly accepted by the business community throughout the world (Gitlow *et al*., 2005; Montes *et al*., 2003). Within the framework of the "quality revolution", company managers and executives have been flooded with articles, books, and seminars. TQM, in this case, has been described as a new model of thinking in business management (Chorn, 1991), a comprehensive style to improve organizational performance and quality (Hunt, 1993), an alternative to the management control (Price, 1989), and today, as a change of paradigm (Broedling, 1990). Some authors historically consider TQM "as a unique approach to improve the organizational effectiveness and survival with solid conceptual foundations providing us a strategy in enhancing company performance and considering how the companies and their staff should operate" (Wruck and Jensen, 1994 in Montes *et al*., 2003: p. 189). To achieving long-term organizational effectiveness and survival, an organization must develop a continuous process improvement and innovation in order to gain a better understanding of sustainability of TQM implementation (Nonaka *et al*., 2003.; Spencer, 1994; Trott, 2004).

The implementations of TQM and QMS, in its turn, can not properly work without utilizing suitable *quality management methods* or QMMs (Kanji and Asher, 1996; Mann and Kehoe, 1994; Zhang, 2000). As an essential component of any successful quality process in a continuous improvement and innovation (Bunney and Dale, 1997; Tidd *et al*.,

2005), QMMs greatly influences the existence of a company (McQuater *et al*., 1995; Mann and Kehoe, 1995). Zhang (2000) stated that there is a widespread consensus that using QMMs is a way of managing an organization to improve its overall long-term organizational effectiveness and survival. Nonetheless, there is less agreement about how many QMMs actually exist and what effect of QMMs on organizational performance is.

To be effective, QMMs should be categorized into several dimensions of QMPs. It then suggested that organizations pursuing their long-term effectiveness and survival should be consistently designed with the QMPs implemented by organizations' TQM strategic choice. Accordingly, it may be argued that organizations with consistent long-term effectiveness and survival in their QMPs will do better than those with inconsistent long-term effectiveness and survival performance. This issue, however, has not been widely explored in literature (Tamimi and Gershon, 1995; Zhang, 2000). Evidence about the relations among QMPs, and contextual factors of an organization which may relate to TQM implementation, and company performance is still limited.

This study designed to fill this gap examines to what extent an appropriate alignment of QMPs, contextual factors of oil and gas industry (WCC and OE) facilitates the achievement of CNFP, which leads to improved CFP. The research model (see Figure 3.4) investigates a rational of linkages among ten research constructs (six QMPs, WCC, OE, two types of company performance—CNFP and CFP.

In this chapter, the relevant literatures for this study are reviewed in the following three major subject areas: (1) definitions and principles of TQM including definitions of quality, quality pioneers' principles, QMPs, and explanation of TQM implementation model; (2)

managerial issues of comprehensive TQM model for oil and gas industry in Indonesia; and (3) TQM practices as connections of differing contextual factors of an oil and gas industry, such as WCC, and OE; company performance (CNFP and CFP). A multidimensional concept of comprehensive TQM implementation model for oil and gas industry in Indonesia that embodies QMPs, WCC, OE, CNFP, and CFP will be presented as well. Through an extensive review of philosophies related to the research framework, all relevant factors of the research constructs are extracted in the last part of this chapter for developing research hypotheses.

2.2 A Literature Map

As shown in Figure 2.1 (A Literature Map), each component of the related topics of TQM implementation for oil and gas industry in Indonesia offers several critical literatures. The extent of scientific rigor in a research study depends on how the researcher has chosen the appropriate literatures by considering the specific purpose of the study (Sekaran, 2000). The purposes of this study including the literature map are:

1. To enable a researcher to understand how the study of the topic adds, extends, or replicates a completed research,
2. To summarize research that has been conducted by others, and it is typically represented in a figure (a hierarchical structure),
3. To present an overview of existing and appropriate literatures for the study, and
4. To visualize how the study relates to the larger literature on the comprehensive TQM implementation and its contextual factors affecting company performance for oil and gas industry in Indonesia.

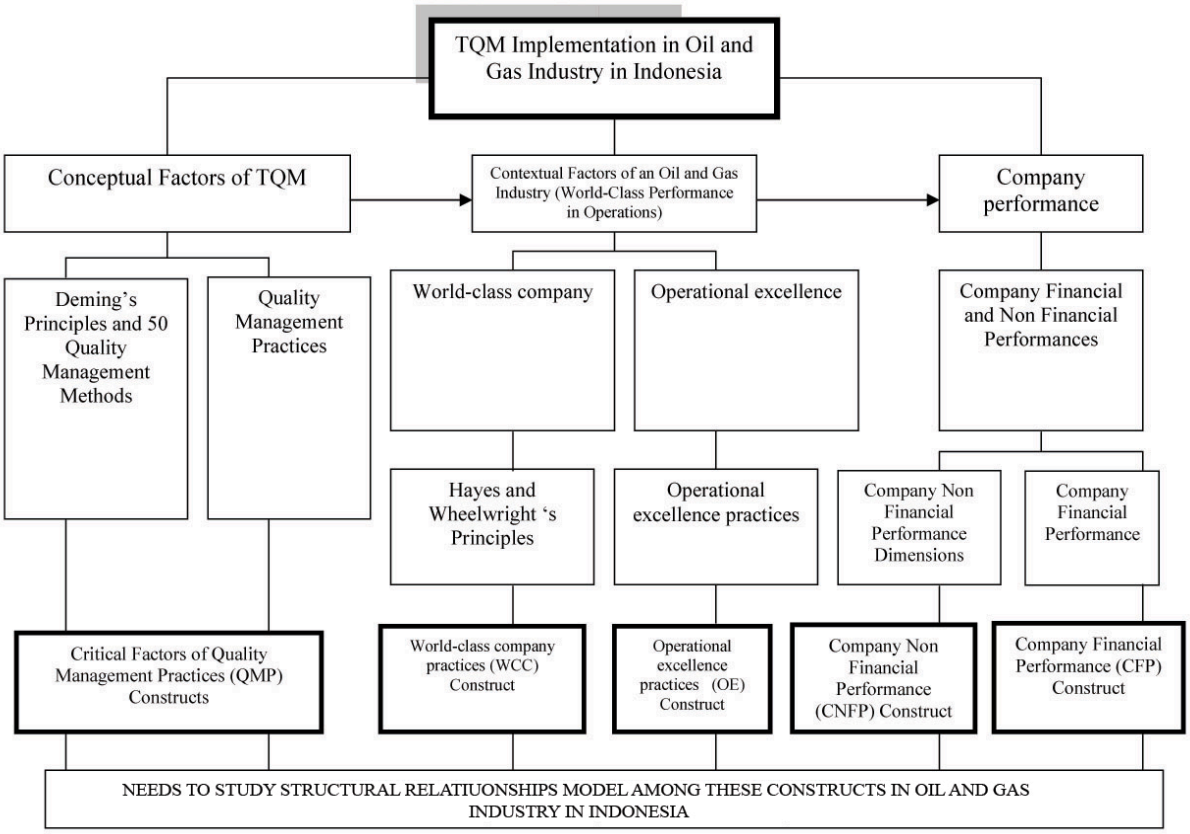

Figure 2.1
A Literature Map

2.3 Quality Principles

Although the literature on TQM includes an abundant spectrum of works, there is still no consensus on the definition of quality (Demirbag *et al*., 2006), as it has been distinctively defined by different authors. Demirbag *et al*. conclude that gurus of the TQM practices such as Deming, Juran, Crosby, Ishikawa, and Feigenbaum all provide their own definitions of quality principles and elements. According to Deming, quality is a predictable degree of uniformity and dependability at low cost and suited to the market. He also identifies 14 principles of quality management to improve productivity and performance of the organization (Deming, 1986). Juran defines quality as "*fitness for use*" and focuses on a trilogy of quality planning, quality control, and quality improvement (Mitra, 1987).

Similarly, Crosby (1979) defines quality as "*conformance to requirements or specifications*" based on the customer needs and identifies 14 steps for a zero defect quality improvement plan to achieve a performance improvement. Similar with Deming, Ishikawa also emphasizes on the importance of total quality control to improve organizations' performance. He contributes to the quality literature by introducing a *cause and effect diagram* (Ishikawa diagram) to diagnose quality problems (Mitra, 1987). Correspondingly, Feigenbaum introduces a concept of organization-wide total quality control and defines quality as "the total composite product and service characteristics of marketing, engineering, manufacturing, and maintenance in which the product and service in use will meet the expectations of the customer" (Mitra, 1987). Major common denominators of these quality improvement plans include management commitment, strategic approach to a quality system, quality measurement, continuous process improvement, education and training, and eliminating the causes of problems (Demirbag *et al*., 2006).

Flood (1993) in responding the quality guru's principles and their philosophies then provides a very detailed analysis by explaining the strengths and weaknesses of each quality pioneer and suggesting – in the following step – a comprehensive direction to implement quality management (Table 2.1). His criticisms for the quality pioneers' principles have emphasized on the insufficient suggestions for organizational transformation and human resource dimension with regard to actual utilization of quality management (Flood, 1993 cited in ByeoungGone, 1997).

Table 2.1
The Strengths and Weaknesses of Quality Principles

Gurus	Strengths	Weaknesses
Deming	1. A systematic functional logic: Interrelationship 2. Management comes before technology 3. Leadership and motivation 4. Statistical and quantitative methods	1. No clear method to actual utilization 2. No intervention about situational circumstances 3. No clear suggestions for dealing with human resource dimension
Juran	1. Concentrate on management practice 2. Focus on the chain of customers 3. Management involvement and commitment	1. No clear suggestions for motivation and leadership 2. Undervalue of workmanship 3. Cultural and political issues are not discussed 4. Failing to deal with human resource
Crosby	1. Provide detailed implementation tools 2. Worker participation is recognized 3. Tangible approach to TQM	1. Heavily emphasis on market 2. Negatively effects on Zero Defects
Ishikawa	1. Participation and problem-solving process 2. Motivation and creativity 3. Mix of quantitative and HRM	1. Heavily emphasis on simple causal analysis 2. No suggestions for interrelationships between causes
Feigenbaum	1. Totally of quality approach 2. Value of socio-technical systems thinking 3. Participation and creativity	1. No suggestions of how to operate

Source: Flood (1993) cited in ByeoungGone (1997)

In conclusion, the key quality principles entirely suggested in the table above – that could be implemented in the management of an organization – are analyzed and summarized as follows (ByeoungGone, 1997):

1. All principles and critics emphasize on a very strong top management leadership and commitment for organizational growth and performance improvement.
2. Quality management practices and activities should emphasize on the continuous improvement and never-ending process.
3. Encouraging the organization to reach a paradigm shift assuming a transformation from an old to a new organizational culture.

4. The organization must be customer-oriented and include the concept of customers and partnership chain. The definition of customers further should also include both external and internal.
5. Organizational structure must be reconsidered as a team-based approach promoting an interrelationship among departments or functions.
6. Human resource management and development dimensions, including employee participation and involvement, training, and employee relations should be reflected upon very carefully.
7. The organization should utilize quality data and reporting systems organization-wide through the performance measurement system, quantitative approaches including statistical methods, quality assurance, and information systems.
8. There should be total adoption and adaptation of a new way of organizational life filled with a significant culture and value shift.

The quality principles initially started in Japan in the 1950's have played a prominent role in the business management literature (Deming, 1986; Juran, 1988). The key message of the so-called quality movement is that management must focus on improving organizational performance to provide superior customer value (Clarke and Clegg, 1998). However, the concepts and ideas coming under the broad umbrella of quality principles have evolved over the last two decades from a focus on inspection of the finished output (product) to a consideration of the whole management system and how this affects the nature of the output or product. Integral to this evolution has been the shift in focus from viewing quality as inherent in the product itself (*First Generation Quality Management*) to as a characteristic of the management system, which is responsible for the finished product (*Second Generation Quality Management*) (Foster and Jonker, 1998).

Another major change that has occurred has been a movement from an almost total emphasis on manufacturing and products to an application of quality principles and ideas in services (Lovelock, 1992). One of the key characteristics of the second generation of quality management lies on the holistic nature of management reflected in the use of "total" in the TQM literature and the holistic nature of the quality awards. However, this implementation makes the quality management seems to be a loosely coupled set of mini-theories, tools, and techniques in which coherence is difficult to discern. Foley (1987) argues that while the basic philosophy, principles, and techniques of quality are sound, problems arise due to the lack of explicit statement or theory of enterprise behavior based on quality. Foley (1999) also adds that such theory of management based on quality (conceptual factor of quality management) would have its roots in economics and statistics and would help to overarch and link other theories of management. In fact, this should ensure that quality is systematically viewed and be understood above the sum of its parts itself (a comprehensive approach of quality management). Unfortunately Foley is unable to articulate such theory based on quality as it is currently conceived (Foster and Jonker, 1998).

However, one aspect, at least, was clarified. As many quality management literatures implicitly assume that the objective of the enterprise is the continuous pursuit of improving quality. Foley (1987, p.3) – in considering this – argues that:

> "Continuous improvement of quality of product and/or service cannot be the end to which competitive business is directed. Whilst every business wants to remain viable ... continuous improvement and customer satisfaction can only be a means to an end and not an end itself. There may be times in the life of an enterprise where, to satisfy its survival (profit) criterion, it will be necessary to discontinue or slow down the rate of quality improvement activity, however clear it might be that those activities would increase quality of product and/or service and customer satisfaction."

In other words, none of quality principles and techniques ends in themselves but they should be seen as potential contributors to the goal of maximizing a long-term value. As a descriptive theory, it suggests that firms who undertake the quality improvements will do so to improve a long-term value of the firm. Foley (1987, p.62) therefore proposes the following theory of quality principle:

> "Maximization of quality in the short-term (subject to the condition that a certain level is achieved) will maximize the long-term value of the firm."

Interestingly, the theory of quality principle uses the term *enterprise valu*e (company non financial) rather than profit (company financial performance) regarded to be too restrictive and suggests that the only beneficiaries of an enterprise are its stakeholders. As a result, a stakeholder theory of quality (*Third Generation Quality Management*) is extended.

Following the seminal work by Freeman (1984), the importance of stakeholders has been emphasized by many scholars (Evan and Freeman, 1988; Preston and Sapienza, 1990) and promoted in many reports. This has been associated with a corresponding attempt to re-conceptualize the nature of the business enterprise called *the stakeholder theory of the firm* (Wheeler and Sillanpaa, 1997; Clarke and Clegg, 1998). So it can be implicitly considered that survival will depend on the firm's relationships with the external world. Building on this, Foley and Barton (1997) suggest that a quality principle should have an explicit focus not only on internal operation but also shareholders, suppliers, internal and external customers. They then develop the foundations of a stakeholder model of quality even though it does not include the external groups as envisaged by Freeman (1984).

Hence quality principles have begun to adapt to the stakeholder view of the firm and include a consideration of external influences and groups. Foley (1999), for instance,

attempts to make this external focus explicitly by reconciling it with a traditional view of business as a profit-maximizing organization (Friedman, 1962). He develops a stakeholder model of quality principles that seeks to incorporate the external stakeholder who is able to influence what happens in an organization and the nature of their issues or concerns. Foley (1999, 2001) starts to observe the way community regards business. He furthermore suggests that despite assertions to the contrary, there is evidence that business is not willing to be seen as simply self-serving and is very conscious of being a '*good corporate citizen*'. Business enterprises fundamentally are often concern with the interests of other stakeholders besides its shareholders such as employees, customers, and the local community (Charkham, 1994). Despite this, Foley (1999) gives a rhetorical question whether being stakeholders rather than shareholders and their potential for affecting the achievement of performance is measured as shareholder value.

The stakeholder model of quality presented attempts to incorporate the increasing necessity for management to respond to the needs and expectations of increasingly diverse groups while still delivering shareholder value. Many of the quality principles and techniques have been concerned with the needs and expectations of particular groups such as customers, employees and suppliers that have been acknowledged for a long time as a part of the traditional managerial model (Freeman, 1984, 1999). The stakeholder model provides a theoretical justification and a conceptual framework in which a relationship between the quality aspects and other diverse groups could be explicitly considered and addressed in a holistic manner.

The stakeholder model of quality – representing an emerging third generation of quality – for that reason could be seen to be fundamentally different from and will gradually replace

earlier models. Indeed, it is so different that it could be seen to that. Its focus is still on quality but the way in which quality is addressed is different. Moreover, it is initially grounded in an explicit theoretical framework (Foster and Jonker, 1998.). Table 2.2 outlines a preliminary list of the characteristics of stakeholder model, and its differences from the previous conceptualizations. While each characteristic may be debated individually, it is entirely considered as the difference among the 'generations' (Foster and Jonker, 1998.).

Table 2.2
Characteristics of the Three Generations of Quality Principle

Characteristics/ Generations	First-Generation (Product Quality)	Second-Generation (Management System)	Third-Generation (Stakeholder Model)
Perspective on Quality	Process	Holistic	Relational
Focus	Measurement	Assessment	Consensus
Type of Action	Reactive	Proactive	Engagement
Criterion for Success	Reliability	Efficiency and Effectiveness	Accountability
Orientation	Production	Policy and Planning	Relationships
Basic Assumptions	Control	Manageability	Inter-connectedness
Change	Improvement	Transformation	Transaction
Stakeholder Relationship	Non-existent	Peripheral/Emerging	Embedded

Source: Foster and Jonker, 1998.

The stakeholder model which is the characteristics of the third generation can be seen as a part of the quality family, as its foundations rest squarely on business processes. However, rather than introducing an additional set of processes to underpin the relationships between the organization and its stakeholders, the model requires fundamentally different types of processes that hitherto have not been a part of normal business practice. These processes are not necessarily based either on a commonality of interests (concerns) or on an unequivocal outcome (objective). They are the processes that must be capable of dealing

with complex issues often ideologically based on problematic, indeterminate answers. These issues, in fact, have been described as the wicked problems for which solutions are neither clear nor agreed (Foster and Jonker, 1998). However, it will not be much more than this. Moving quality principle beyond a strictly internal process orientation is really a part of a business aim since it is concerning with the stakeholders' needs and expectations. It is then raising a question about sensitivity towards community, environmental and other issues: is quality more focused than profits? However, by giving the aim of business, it really is able to contribute to the long-term survival of the firm.

Garvin (1988) cited in Kok *et al.* (2001) describes how the ideas in the scope of quality principle had changed in management thinking during the last century. *In the first stage of the evolution of quality principle*, quality has been related primarily to the products (goods and services), and the performances of those goods and services. *In the second stage of the evolution* the view on quality was broadened to the processes by which the products (goods and services) were manufactured. Thus the focus shifted from the end of production line to the process. *The third stage* was again a broadening of the focus from the process to system (the mechanistic approach of quality principle). It was recognized that not only the primary production process influences the performances of the end product; but also the supporting, supplying, and management processes act on that primary process and contribute to the products. The focus turned into the quality of the system. *The fourth stage* can be defined as *the TQM stage*, where quality has become a more strategic issue and the focus is broadened towards the quality of the organization and its relationships with the environment (customers, suppliers, competitors, society at large or the stakeholder). In addition TQM is an organization-wide function. Hence organizations have responded to the challenge by embracing a broad view of quality principle. Organizations are beginning to

stress on the management of quality in all phases and aspects of their business (the organic approach of quality principle), not merely on the province of operation (Benson *et al.*, 1991).

TQM, in turn, is often described as a philosophy of management that strives to make the best function of available resources and opportunities by a constant improvement. Along with the definitions provided (Oakland and Sohal, 1996), and the desire of organizations to assess their progress in implementing many ideas and techniques, a standard or framework in which organizations may be assessed or compared is trying to be searched. This has resulted in a range of such frameworks including the *US Baldrige Award*, *the UK Quality Award*, *the European Excellence Model*, and *the Australian Quality Awards* (Evans and Lindsay, 1995). Although developed independently, and often reflecting the needs and particular circumstances of the country in which it operates, they all have a lot in common that is focusing on the organization's process and stakeholder model, QMS based on the quality pioneers, and the framework of TQM implementation model (Oakland and Sohal, 1996; Foster and Jonker, 1998).

In the following subsection, the researcher *describes Deming's principles,* i.e. QMM and TQM followed by the description of QMPs, TQM implementation, and sustainability of TQM implementation program.

2.4. Deming's Principles and Its Development

2.4.1 Deming's Principles

Three of the quality leaders in the United States, namely W. Edwards Deming, Joseph M. Juran, and Philip B. Crosby, are regarded as truly management gurus in a quality revolution

(Evans and Lindsay, 1996). Frameworks for attaining competitive advantages through quality management have been developed through Crosby's 14 steps (1979), Deming's 14 prescriptive points (1982), and Juran's trilogy (Juran and Gryna, 1980). Each of these gurus identifies a "*set of key variables*" claimed by them to be essential to achieve superior quality outcomes (Motwani, 2001).

In this study, the researcher focuses on the ideas of W. Edwards Deming. The following are the justifications of the reasons why Deming's principles have been selected in this study:

1. Deming stresses that successful TQM implementation programs are well served by developing a family of change strategies, rather than an end in and of itself—continual never-ending improvement (Foster, 2004; Grotevant, 1998). Successful TQM implementation model for oil and gas industry recognizes that TQM is not only as an independent transformation strategy but also as a useful adjunct or follow-up towards the everlasting change efforts (i.e., WCC and OE).
2. The Deming's principle of quality management focuses on bringing out the improvements in product and service quality by reducing uncertainty and variability in the design and manufacturing processes (Deming, 1986; Evans and Lindsay, 1996; Flood, 1993; Foster, 2004; Motwani, 2001). Deming firstly proposed his theory (Quality Management) as a system while explaining it to Japanese and American business leaders in the 1960s. Deming's system was primarily concerned with manufacturing, yet it outlined the basic principles of the supply-/demand-chain as practiced in oil and gas industry today (upstream and downstream sectors) (Malone, 2005).
3. Deming widens the ambit of the concept of quality and includes efforts made by producer to satisfy the customer. Increased customer satisfaction also helps to enhance

the producer's share in the market. In a competitive market, it is desirable for companies to promote the concept of quality focused on fulfilling the customer's requirements. Thus, quality is not a static concept but a dynamic one, which always changes from customer to customer, from product to product, and from time to time (Anand, 2003; Weller, 1996).

4. Deming also develops the quality principles as known as Deming's principles construct:
    a. A systemic functional logic: Interrelationship
    b. Management comes before technology
    c. Leadership and motivation
    d. Statistical and quantitative methods (Flood, 1993).

Deming then becomes more human-oriented in his writings, coming up with his famous quality management principles such as the basic tenet of quality management, the *Five Deadly Diseases*, and the *Fourteen Points*. Any discussion of TQM implementation must start from a description of Deming's universal fourteen points of quality management principles, which are the foundation of TQM and guide the entire TQM implementation in the organization. There are five deadly diseases that must be eliminated from an organization before TQM implementation may be successful. If not, they may not only prevent the TQM implementation but may gradually affect the organization (Gitlow *et al.*, 2005).

Since the five deadly diseases are so critical to any implementation of TQM, according to Dean and Bowen (1994), TQM should be developed as a potential meta-analysis, an attractive alternative for integrating research findings (Glass, 1976; Glass *et al*., 1981 cited in Churchill *et al*., 1985). In essence, meta-analysis is an application of the principles

traditionally employed in primary research studies to review and integrate the findings in a body of studies (Churchill *et al*., 1985). The study of the implementation of TQM uses meta-analysis to analyze the evidence about the QMPs that badly affect the company performance.

In addition, the implementation of TQM encompasses many cross-functional, multi-disciplinary philosophies and approaches. TQM also has one basic assumption called totality. Deming's philosophy about quality can describe best the concept of the totality in TQM. In the context of totality, Deming described his fourteen points as *A Theory of Chain Reaction* and *A System of Profound Knowledge* or SPK. Interpreted by Anderson *et al*. (1994), Deming's system thinking (Deming's chain reaction theory) is a pursuit of the internal and external cooperation. Cooperation itself is synonymous with collaboration among different individuals, groups or organizations, where all entities engaged in noncompetitive, mutually beneficial, *win-win* activities (Anderson *et al*., 1994).

Based on this interpretation, Deming's idea is very similar to the new system theory presented by sociologists (e.g., Bailey, 1992). Both Deming's ideas and new system theory emphasize on external environments (customers) and internal processes (the inter-correlation of elements) to improve quality. To be fit within the external environment, the dynamic equilibrium between internal processes and their environment should be maintained in order to decrease the costs (Bailey, 1992; Deming, 1986). Therefore, "sub-optimization in an organization is opposed" (Deming, 1986 in Wang, 2004: p. 395). In addition, to accomplish reductions in variation, Deming advocates an eternal never-ending cycle of product design, manufacturing, test and sales, followed by market surveys, redesign to capture market with better quality and lower price. He claimed that higher

quality leads to higher productivity, in its turn, leading to long-term competitive strength to stay in business and to provide jobs (Evans and Lindsay, 1996). Figure 2.2 shows Deming's *Chain Reaction Theory*.

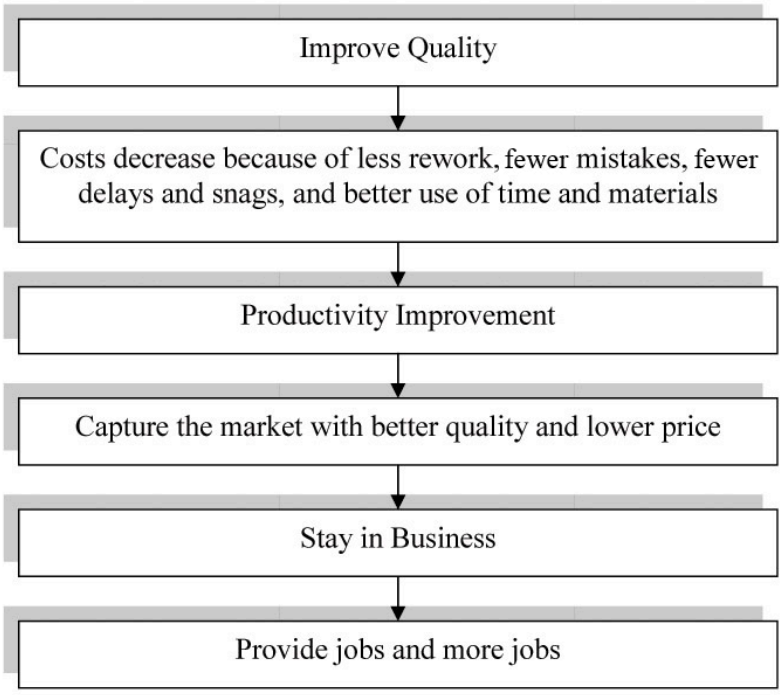

Figure 2.2 Deming's Chain Reaction Theory
Source: Evans and Lindsay (1996)

2.4.2 Quality Management Method (QMM)

The philosophies of Deming, Juran and Crosby provide the fundamental principles on which total quality is based on (Motwani, 2001). While these principles are seldom accompanied by rigorous supporting evidence, they have some degrees of facing validity (Dow *et al*., 1999). Based on the fundamental principle of Deming (improvement efforts), the quality management concept or method goes by several different names. It has been called TQL (*total quality leadership*), TQC (*total quality control*), TQ (*total quality*), TQO (*total quality organizations*), or TQM. Regardless of the name used, the quality management concept or method can be defined as follows:

> "Quality management method (QMM) is an approach (a method) to doing business that maximizes the competitiveness of an organization through continuous improvement of its products, services, people, processes, and environments" (Goetsch, 2005: p. 786).

According to Zhang (2000), the aim of utilizing QMM is to improve business performance. To have a better understanding of QMM, the assessment of suitable QMM consequently is required. One of the most influential individuals in the revolution of QMM was Edward Deming. The Deming's quality management method contains a prescriptive set of 14 points as the guidelines for an appropriate organizational behavior and practice regarding TQM (Anderson, *et al.*, 1994). Deming's philosophy of quality management itself – as stated earlier – focuses on bringing about the improvements both in product and service quality by reducing uncertainty and variability in the design and manufacturing processes (Deming, 1986; Evans and Lindsay, 1996; Saraph *et al*., 1989; Flood, 1993).

To make it easier in recognizing how QMM, as guidelines, prescribes the approaches/ method in the implementation of 14 points of quality management, the researcher provides the methods of Deming's 50 quality management related to 14 points of quality management (ByeoungGone, 1997; Tamimi, 1995).

After the comprehensive review of the QMM from Deming, the following definitions of TQM are considered to be applied in this study.

2.4.3 Total Quality Management (TQM)

A variety of definitions of TQM has been offered over the years. Reviewing previous contributions (e.g. Steingard and Fitzgibbons, 1993; Dean and Bowen, 1994; Dean and

Evans, 1994; Sitkin *et al*., 1994; Hellsten and Klefsjö, 2000; Reed *et al*., 2000; Montes *et al*., 2003; Demirbag *et al*., 2006), a dominant insight among experts seems to define TQM as an approach to management characterized by some guiding principles or core concepts that embody the way the organization is expected to operate, which, when effectively linked together, will lead to high performance. There is a general agreement regarding the assumptions included in the TQM concept, which can be summarized in three main points (Bou-Llusar *et al*., 2009).

Firstly, the core concepts of TQM can be classified into two broad categories or dimensions: social (organic) or soft TQM, and technical (mechanistic) or hard TQM (Dotchin and Oaklnad, 1992; Yong and Wilkinson, 2001; Prajogo and Sohal, 2004b; Rahman, 2004; Rahman and Bullock, 2005; Lewis *et al*., 2006). The social issues are centered on human resource management and emphasize on leadership, teamwork, training and development, and employee involvement. The technical issues meanwhile reflect an orientation toward improving production methods and operations and seek to establish a working method through an establishment of well-defined processes and procedures to make the constant improvement of goods and services to customers might occur.

Secondly, the management of social or technical TQM issues can not be separately performed. Instead both social and technical dimensions should be interrelated and mutually support each other (Flynn *et al*., 1994; Wruck and Jensen, 1994; Hackman and Wageman, 1995; Sun, 1999) reflecting the holistic character of TQM initiatives. This holistic character is also extended to the expected results of a TQM initiative, as a balance of the stakeholders' interests should be considered when the firm defines TQM

implementations (Stainer and Stainer, 1995; Oakland and Oakland, 1998; Fissher and Nijhof, 2005).

Thirdly, the literature suggests that the optimal management of TQM core concepts will lead to a better organizational performance, as studies such as Powell (1995); Terziovski and Samson (1999); Zhang (2000); Hendricks and Singhal (2001); or Kaynak (2003) have verified. The basic theoretical foundations for this relationship is based on an assumption that TQM provides superior value to the customer by identifying customers' expression and latent needs, responsiveness to changing markets, as well as through improving the efficiency of the production processes (goods or services) (Reed *et al*., 1996; Anderson *et al*., 1994).

Within the framework of TQM, a definition can be made between contents and elements or processes. The former has been known under the names of content (Reed *et al*., 2000), principles (Dean and Bowen, 1994), precepts (Sitkin *et al*., 1994), values (Hellsten and Klefsjö, 2000) or basic attributes (Dean and Evans, 1994). Although definitions do not completely coincide, all of them refer to those fundamentals that make up TQM theoretical frame. Without the implementation of management system in an organization or the philosophy on which it is based on, it could not be called TQM (Montes *et al*., 2003). Similarly, the so-called elements (Waldman, 1994), practices (Dean and Bowen, 1994), techniques (Hellsten and Klefsjö, 2000), processes (Reed *et al*., 2000), interventions (Hackman and Wageman, 1995), principles (Sitkin *et al*., 1994), refer to a mechanism through which the above mentioned established basic foundations are put into effect, by means of the effective implementation of the different management processes (Montes *et al*., 2003).

TQM is frequently mentioned in many discussions concerning with quality and, according to Hodgetts (1996), all enterprises, regardless of size and financial status, are involved in the quality revolution. There are many descriptions about the concept of TQM, but with few clear definitions (Eriksson and Hansson, 2003). For example, Oakland (1989), describes TQM as an approach to improve competitiveness, efficiency and flexibility for a whole organization. TQM by Dale (1994) and Huxtable (1995) is as an important management philosophy, which sustains the organizations in their efforts to obtain the customer satisfaction. Some argue that TQM is a management approach, while others state that TQM is a management system. Hellsten and Klefsjö (2000) define TQM as "a management system in a continuous change, which is constituted of values, methodologies and tools, the aim of which is to increase external and internal customer satisfaction with a reduced amount of resources" (Eriksson and Hansson, 2003: p. 37).

As a business management approach or philosophy, TQM principally refers to a culture of an organization committed to customer satisfaction through developing continuous improvement strategies. This culture varies from one country to another and among different industries, yet it has certain essential principles of quality management method, which could be implemented to secure greater market-share, increased profits, and reduced costs (Kanji and Wallace, 2000 cited in Demirbag, *et al*., 2006). According to Demirbag *et al.* (2006), intensifying global competition and increasing demand for better quality by customers have encouraged more and more companies to realize that they will have to provide high quality product and/or services in order to successfully compete in the marketplace. To meet the challenge of this global competition, many businesses have invested some substantial resources in adapting and implementing TQM (continuous

improvement) strategies. In this study, the definition by Demirbag *et al.*, (2006) is used. They define TQM as:

> "A holistic and stakeholder management philosophy aiming at continuous improvement in all functions of an organization to produce and deliver commodities or services in line with stakeholders' needs or requirements by better, cheaper, faster, safer, easier processing than competitors with the participation of all employees under the leadership of top, middle, and low levels of management—as the objectives of improvement strategy" (Demirbag *et al*., 2006: p. 830).

The role of TQM is widely recognized as being a critical determinant in the success and survival of both manufacturing and service organizations in today's competitive environment (Demirbag *et al*., 2006). TQM is also considered as a source of competitive advantage (Douglas and Judge, 2001; Hackman and Wageman, 1995; Powel, 1995), innovation (Sing and Smith, 2004), change and new organizational culture (Irani *et al*., 2004). Any decline in customer satisfaction due to poor product/service quality would be a serious cause of organizational failure. Customers are becoming increasingly aware of rising standards in product/service quality, prompted by competitive trends, which have developed higher expectations (Demirbag *et al*., 2006).

TQM approach then has become a solution to the challenges faced by an organization in the highly competitive global economy. Although there are many variations, most knowledgeable observers would agree that the dominant focuses of TQM are to improve in-house work processes and to concentrate on an improvement in efficiency, reliability, and quality (Luthans *et al*., 1995). Steingard and Fitzgibbons (1993) define TQM as:

> "A set of techniques and procedures used to reduce or eliminate variation from a production process or service-delivery system in order to improve efficiency, reliability, and quality—as the dimensions of improvement strategy" (Steingard and Fitzgibbons, 1993: p. 27).

Improved product/service quality is currently considered as a significant element in a firm's competitive advantage. Furthermore, as international and global markets continue to develop, product/service quality is increasingly viewed as a strategic asset to improve a firm's global competitiveness. Management awareness of the importance of TQM implementation, alongside business process reengineering and other continuous improvement techniques is stimulated by the benchmarking movement to seek, study, implement, and improve on best practices (Zairi and Ahmed, 1999). A review of extant literature on TQM and continuous improvement programs identifies 12 QMPs: committed leadership, adoption and communication of TQM, closer customer relationships, benchmarking, increased training, open organization, employee empowerment and development, zero defects mentality, flexible manufacturing, process improvement, and measurement (Demirbag *et al*., 2006).

In the next subsection, the researcher describes the QMPs as improvement strategy dimensions.

2.4.4 Critical Factors of Quality Management Practices (QMPs) as Improvement Strategy Dimensions

In this study, the researcher uses the term of improvement strategy to refer to the improvements within the manufacturing function. The strategy defines the manufacturer's objectives in pursuing improvement by delineating both the ends (what to improve) and the means (how to achieve it). By integrating the diverse activities leading to the creation, development, and commercialization of products and technologies, a company might be able to maximize its payoff from improvement/innovation efforts (Zahra and Das, 1993).

At this point, a manufacturing (i.e. oil and gas company) improvement strategy is able to guide the executive actions by determining critical factors of improvement efforts.

Saraph *et al.* (1989) pioneer the efforts to empirically identify and validate the critical factors of QMP by developing 78 items related to QMM or TQM practices classified into eight critical factors to measure the QMP in an organization and label these critical factors as the role of divisional top management and quality policy, role of the quality department, training, product and service design, supplier quality management, process management, quality data and reporting, and employee relationship.

A major strength of this instrument is the high level of external validity ensured through inclusion of manufacturing and service industries in the sample. The response sample of 162 managers spanned both the manufacturing and service sector, and included about 20 firms. The weakness of the instrument is that it excludes at least two important constructs: customer focus and use of SPC (Ahire *et al*., 1996b cited in Motwani, 2001).

Flynn *et al.* (1994) meanwhile develop another instrument identifying seven QMPs, namely top management support, quality information, process management, product design, workforce management, supplier involvement, and customer involvement. This instrument is in close resemblance to the preceding instrument developed by Saraph *et al*. (1989). Flynn *et al.* (1994) collect data on quality management practices from 42 manufacturing plants from the machinery, transportation component and electronics industry. Thus, as compared to the instrument of Saraph *et al.* (1989), the focus of this instrument is more emphasized on the manufacturing sector. The response sample size for various constructs varied from 41 (for selection for teamwork potential) to 613 (for teamwork). In a later

study, Flynn *et al*. (1995) evaluate the impact of TQM practices on quality performance and competitive advantage. The instrument of this study includes the team-oriented scales, namely selection for potential teamwork, customer interaction, and cleanliness and organization found in no other instruments. However, this instrument excludes employee empowerment and benchmarking scales found in Ahire *et al.*'s instrument.

On the other hand, Ahire *et al.* (1996a) identify, validate, and test 12 constructs of integrated quality management through an empirical survey in 371 manufacturing firms. This instrument is based on a methodical review of the conceptual and empirical literature on TQM. Comprehensive scale refinement and validation procedure using the confirmatory factor analysis approach are employed. The refinement and validated scales are then used for estimating correlation using LISREL. The authors explicitly test the convergent validity of each scale and discriminated validity among the constructs as well. In this instrument, scales pertaining to product quality and supplier performance represent TQM outcomes rather than strategies (inputs) as in Flynn *et al*.'s instrument.

Tamimi (1995) states that the effective transformation to the TQM organization has been linked to the extent to which firms successfully implement certain critical TQM practices. It then interprets the following eight critical success factors of TQM: top management commitment, supervisory leadership, education, and cross-functional communication to improve quality, supplier management, training, product/service innovation, and providing assurance to employees. Interestingly, Tamimi's eight critical success factors of TQM closely resemble the factors developed by Saraph *et.al*. (1989). The Tamimi's study reduces Deming's 14 points into a smaller set of meaningful factors (QMPs) for easier implementation. In a later study, Tamimi (1998) also developed a second-order factor

model to test whether a set of eight QMPs loads on an overall construct that may be termed as TQM. The results provide eight factors collectively loading on a single factor called the QMPs.

Powell (1995) develops a TQM measurement instrument based on an exhaustive review of the TQM prescriptive literature and revises the scale through frequent discussion and site visits with consultants and quality executives. The final scale contains 47 items covering 12 variables. Different from other empirical studies, Powell (1995) specifically cites the discrete quality management tools (such as just-in-time manufacturing and materials resources plan) as part of his 12 quality management prescriptions.

Similarly, using the MBNQA criteria, Black and Porter (1996) identify ten empirically validated QMPs including corporate quality culture, strategic quality management, quality improvement measurement systems, people and customer management, operational quality planning, external interface management, supplier partnerships, teamwork structures, customer satisfaction orientation, and communication of improvement information. All ten factors generated by this empirical analysis are consistent with the factors proposed by Saraph *et al*. (1989); Flynn *et al*. (1994); and Ahire *et al*. (1996). In addition to Black and Porter (1996), various authors also assess the validity of MBNQA criteria (Wilson and Collier, 2000; Flynn and Saladin, 2001).

Zeitz *et al*. (1997) develop a survey instrument designed to measure TQM and supporting organizational culture. In this study, 13 priori dimensions of TQM and ten priori dimensions of organizational culture or climate are operated in a 113-item survey designed to measure the level of culture and TQM experienced by individual members. A factor

analysis of results from 886 respondents indicates that seven TQM and five cultural dimensions account for most of the scale variance. The scale refinement and validation used for the development of this instrument are similar to the empirical studies from Saraph *et al*. (1989); Flynn *et al*. (1994); and Ahire *et al*. (1996). The seven TQM dimensions in the reduced instrument (management support, suggestions, use of data, supplies, supervision, continuous improvement, and customer orientation) – though quite consistent with the thrust of most TQM authors – are less comprehensive than the empirical studies from Saraph *et al*. (1989); Flynn *et al.* (1994); Ahire *et al*. (1996); and (Motwani, 2001).

The seven instruments discussed above are comprehensive and possess higher validity than the non-empirical TQM studies. In many respects, these instruments complement each other. According to Motwani (2001), a blending of the seven instruments is the best approach to take for the identification of critical factors of quality management practices. In addition, Easton and Jarrell (1998) examined the impact of TQM on the performance of 108 firms starting TQM implementation between 1981 and 1991 by comparing each firm's performance to a control benchmark. The findings indicate that performance, measured by accounting variables and stock returns, is improved for the firms adopting TQM. The improvement is also consistently stronger for firms with more advanced TQM systems.

Through a judgmental process of grouping similar requirements, an integrated TQM can be viewed as a composite of the following seven QMPs:

(1) *top management commitment and supervisory leadership*;

(2) *employee training and empowerment*;

(3) *quality measurement and benchmarking*;

(4) *process management*;

(5) *customer involvement and satisfaction*;

(6) *supplier/vendor quality management*; and

(7) *product design*.

Since only one author mentioned the factor ***adopting the philosophy***, this factor is not included. Meanwhile the other factors cover the entire range of activities deemed critically by TQM authors. According to Motwani (2001), several authors have proposed different quality measures that affect business performance. According to Deming (1982), higher quality leads to less rework, lower costs, higher productivity, lower prices, and increased market share. Garvin (1988) shows how a conformance of quality results in lower warranty and product liability costs, lower rework and scrap, and lower manufacturing costs. He also offers another model that depicts how improved performance and features lead to a higher reputation, increased market shares, and high prices. Measures such as the proportion of defects, the percentage of products needing rework, the total cost of quality and the defect rate relative to competitors are the most common types of archival quality outcome indicators employed by several researchers (Adam and Jacobsen, 1994; Flynn *et al*., 1994; Maani *et al*., 1994). Seven QMPs and some of these measures are briefly discussed below (Motwani, 2001).

(1) Factor 1—Top Management Commitment and Supervisory Leadership. The degree of visibility and support that management takes in implementing a total quality environment is critical towards the success of TQM implementation (Deming, 1982; Juran and Gyrna, 1980). The literature review uncovered four distinctive ways where management can support TQM implementation, namely allocating budgets and resources; controlling through visibility; monitoring progress; and planning for change. Inherent in

these components is widely supported by philosophy of reducing management waste, hindering efficiency (Ahire *et al*., 1996; Hardie, 1998). There, additionally, should be a focus on transferring management support to the shop-floor. A champion or change agent frequently leads the efforts to improvement. A successful operation may require roles and knowledge not found in an earlier organization. Referring to that, management should plan to reduce traditionally structured operational levels and unnecessary positions. Simplifying the organization will lead to the establishment of an infrastructure of integrated business functions participating as a team and supporting a strategic vision of the company (world-class manufacturing) (Ross, 1991).

The aim of supervisory leadership should not merely tell people how to do a job, but to supervise people how to do a job better. Leadership totally is a learned skill, so organizations must train their managers to be good leaders and creative supervisors to support their contributions and participations on management-by-committees—participative management system.

(2) Factor 2—Employee Training and Empowerment. Employees must be oriented to a company's philosophy of commitment to never-ending improvement, be informed of company goals, and be made to feel a part of the team (sense of belonging). A proper training includes an explanation of overall company operations and product quality specifications. Where SPC is practiced, training in statistical methods must be included. Specific measures for evaluating training include: the time and money spent by organizations in training employees and management in quality principles, problem-solving skills, and teamwork (Black and Porter, 1996; Saraph *et al*., 1989). On the other hand, the specific measures of employee empowerment include the degree in which cross-

departmental and work teams are used, the extent of employee autonomy in decision making, the extent of employee interaction with customers, and the extent to which employee suggestion systems are being used (Powell, 1995; Zeitz *et al*., 1997).

(3) Factor 3—Quality Measurement and Benchmarking. A company must embrace a strong acceptance and maintenance of a total quality measurement and benchmarking plan. Most authors endorse a "*zero defect*" and a "*do it right the first time*" attitude towards the quality program—as an internal culture of the organization. Quality programs should measure the percentage or the number of parts that deviate from the acceptance to prevent the recurrence of a defect. Measurement techniques should also include monitoring supplier quality levels, utilizing SPC to reduce process variability, and calculating the cost of quality (Ahire *et al*., 1996b; Powell, 1995; Hardie, 1998). The cost of quality could include the relevant changes in market share, warranty costs, and inspections, reworks, and scrap costs. The cost of non-conforming raw materials could include lost revenue or productivity costs and would aid in vendor selection and certification.

(4) Factor 4—Process Management. This factor emphasizes on the added value to processes, increasing quality levels, and raising productivity for each employee. However, there are various tactics emphasized to accomplish this factor, which include improving work center methods and installing operator-controlled processes that lead to a lower unit cost, embracing *kaizen* (continuous process improvement) philosophies, reducing the operator material handling duties, promoting a design for a manufacturing program, and achieving a compact process flow (Kasul and Motwani, 1995a, 1995b; Hardie, 1998). Maskell (1989) and Sellenheim (1991) support the use of more universal measurements instead of individual or departmental measures historically in use. Maskell suggests

measuring productivity through the use of a calculation of finished products divided by the number of people or the production hours used to make those items. Sellenheim promotes comparing the non-value cost as a percentage of value-added activity on a time basis to determine whether an operation is improving on eliminating waste.

The Taguchi method, on the other hand, is a variation of the traditional view of the customer dissatisfaction due to poor quality. Under the traditional manufacturing perspective, "quality losses" are incurred when a unit of the product falls outside of the lower or upper limits of some predetermined manufacturing specification range. Under the Taguchi perspective, a "*quality loss*" is incurred whenever a unit of the product does not reach the exact target value. Variations from this target value that are still within manufacturing specifications do not cause a company to incur internal failure costs of scrap or rework. Thus, the difference between the Taguchi perspective and the traditional perspective is that Taguchi recognizes the customer dissatisfaction even when the unit of the product is within the specified range (Margavio *et al*., 1993).

(5) Factor 5—Customer Involvement and Satisfaction. Customer service should be addressed from two main areas; those are internal customer service and external customer assurance. Components of an internal customer service plan should include providing timely and dependable deliveries, presenting improvements or cost saving suggestions to management and authorizing employees to self-implement solutions, cross-training employees for mastery of more than one job and providing an adequate technical training. An external customer service program, on the other hand, should include providing customers with timely information and quick responsiveness to complaints, and maintaining a corporate goal to reduce the quantity of questions or complaints while

recognizing all successful efforts by employees in providing outstanding service (Kasul and Motwani, 1995b). Measures need to be those which show where improvement has been made and where improvement is possible, rather than merely monitoring people's work. Traditional production measures have assessed personal performance rather than providing information that helps people to improve.

Maskell (1989) prescribes in monitoring the percentage or the number of orders that are delivered late. Subsequent to this, the amount of lateness in minutes will provide a tool in measuring the spread of delivery time. Stickler (1989) expands this concept to emphasize the succeeding operation or work center as a customer. His philosophy centers on a measure of the value-added labor that meets the customer's specific needs. On the other hand, utilizing customer surveys and measuring the percentage of repeat sales to existing customers are able to be utilized to measure customer satisfaction (Hardie, 1998).

(6) Factor 6—Supplier/Vendor Quality Management. A company should support the need to work closer to their suppliers. Partnerships with suppliers have the greatest appeal to most companies due to the shared risks associated with the development of new products. Vendor partnerships should be based on a quality program and accepted documentation of progress towards continuous improvement in quality. Material availability is a simple measure suggested by Maskell (1989) to eliminate problem areas where the material is not available when and where it is needed. Maskell further suggests that this measure is used to identify and eliminate the causes of material shortages. Sheridan (1990) prescribes the usage of a total inventory turnover rate of 25 or more per year and lot sizes of one as effective performance measures.

(7) **Factor 7—Product Design.** Design practices provide an ideal starting point for the study of quality performance. At this stage, everything is in flux. Product requirements are still on paper, components are not to be determined yet, and vendors are unspecified. A wide range of possible choices exist once the designs are finalized. Organizations should consider the factors when they plan the product design processes; namely completely understanding the customer product and service requirements; emphasizing on fitness of use; clarity of specifications and producing ability and involving all affected departments in the design reviews; and avoiding frequent redesign. Maskell (1989) notes that "measurement of innovation and creativity" are always very difficult to do" and additionally suggests to count the number of new products introduced over a period of time and to measure the time taken from design to first sale. Meanwhile, Sellenheim (1991) promotes the use of common or standard parts in as many end items as possible to achieve flexibility.

These factors span the entire range of activities critically deemed by TQM authors. Table 2.3 provides a comparative list of critical factors of quality management practices identified in the seven empirical studies.

Table 2.3
Comparison List of Critical Factors of *Quality Management Practices* (QMPs)

I. Saraph *et al* (1989)	II. Flynn et al. (1994)	III. Ahire *et al* (1996)	IV. Zeitz *et al.* (1997)	V. Black and Porter (1996)	VI. Powell (1995)	VII. Tamimi (1995)
1. Top management leadership	1. Top management support	1. Top management commitment	1. Management support	1. Strategic quality management and corporate quality culture	1. Executive commitment and **adopting philosophy**	1.Top management commitment
2. Quality data and reporting	2. Quality information	2. Internal quality information usage	2. Use of data	2. Quality improvement measurement system and communication of improvement information	2. Measurement and zero defects mentality	2. Cross-functional communication to improve quality
3. Process management	3. Process management			3. Operational quality planning	3. Process improvement and flexible manufacturing	
4. Product /service design	4. Product design	3. Design quality management		4.External interface management		3.Product/ service innovation
5. Training	5. Workforce management	4. Employee training			4. Training	4. Training
6. Supplier quality management	6. Supplier Involvement	5. Supplier quality management and supplier performance	3. Supplier relationships	5. Supplier partnerships	5. Closer to suppliers	5. Supplier management
7. Role of the quality department	7. Employee involvement	6. Employee suggestions				
8. Employee relations		7. Employee empowerment	4.Employee improvements	6. People and customer management	6. Employee empowerment	6.Providing assurance to employees
	8. Customer involvement	8. Customer focus	5. Customers	7. Customer satisfaction orientation	7. Closer to customer	
		9. SPC usage				
		10. Benchmarking			8. Benchmarking	7. Education
			6. Supervision			8. Supervisory leadership

Source; Motwani, 2001: p. 296 and Tamimi, 1995: p. 3048

While it is certainly true that other sets of QMPs and measurements could be developed or defined differently in the future, this set appears to capture most of the important aspects of effective TQM recommended by today's leading researchers and practitioners (Motwani, 2001). As far as the implementation of these factors is concerned, Motwani visualizes TQM as a construction of a house. First, he recommends in putting *top management commitment and supervisory leadership* to TQM as the base or foundation. Without a strong foundation, the house will never stand indeed. Once the foundation is already in place, attention should be put into employee *training and empowerment, quality measurement and benchmarking, process management, and customer involvement and empowerment*. These factors can be

viewed as the four pillars of TQM implementation. Once the pillars are being put in place and enriched, it is time to incorporate the factors of vendor/supplier quality management and product design. These are the final elements to achieving TQM implementation, which also requires a promotion of a collective commitment to quality goals by all organizational members or stakeholders over a broad period of time. The following section will describe further TQM implementation and sustainability of TQM implementation program.

2.4.5. TQM Implementation and Sustainability of TQM Implementation

2.4.5.1 TQM Implementation

According to Zain *et al*. (2001), the body of TQM related to knowledge can be classified into two categories. In the first category, researcher has attempted to comprehend and rationalize the complexities of numerous quality ideas, concepts and theories that afterward are proceeded to systemize into the manageable guidelines to assist organizations to diagnose their circumstances and subsequently improve implementation actions. This category examines '*how*' of TQM implementation. In the second category, researchers have examined gaps in the body of knowledge, and attempted to fill these gaps by developing new guidelines and procedures. This second category examines '*what*' of TQM.

The analysis of 'what' of TQM indicates a balance in term of TQM implementation issues as well as the development of basic concepts (previous TQM research theses), which is an indicator of maturing body of TQM knowledge and associated theory, as illustrated in Table 2.4.

Table 2.4
Previous TQM Research Theses

'HOW' (TQM Implementation)	'WHAT' (Development of New Areas of Study)
1. Identification of critical factors for effective TQM implementation (quality management practices) 2. Effective Implementation of TQM 3. Quality Development of post-ISO9000 companies	1. To measure the 'quality position' of the organizations 2. To develop total quality culture 3. To streamline time-based quality development 4. To implement quality planning 5. To capture cost of quality 6. To measure quality performance

Source: Zain *et al*. (2001)

Evans and Lindsay (1996) suggest three core principles to support TQM implementation: (1) focusing on achieving customer satisfaction; (2) striving for continuous improvement; and (3) encouraging the full involvement of the entire work force. Lee *et al*. (1992) also provide a very clear definition of TQM implementation, which, according to them. is an organizational strategy and accompanying techniques that result in the delivery of high-quality products and/or services to customers (Lee *et al.*, 1992 in ByeoungGone, 1997: pp. 23-24.) Basically, an effective TQM implementation requires five criteria:

1. The strategy is formulated at the top-management level and is diffused throughout the organization. From top executives to hourly employees, everyone operates under a TQM strategy of delivering quality products and/or services to customers. TQM becomes the dominant cultural value throughout the organization.
2. The techniques of TQM range from traditional inspection and statistical quality control to cutting-edge human resource management techniques, such as self-managing teams (Wadswordth *et al*., 1986).
3. Quality is operated by meeting or exceeding customer expectations. Thus, quality is defined by the customer, and the product and/or service must meet or exceed what the customers expect.

4. Under TQM, the quality must be actually delivered to customers. People, not slogans or written mandates, deliver quality products and/or services (Scarnati and Scarnati, 2002).
5. Customers include not only the buyer or external user of the product or service, but also internal customers. TQM includes all the support personnel inside and outside the organization associated with the product or service (Lawler *et al*., 1992).

Cohen and Brand (1993); Fuchsberg (1992); George and Weimerskirch (1994); and Omachonu and Ross (1994) differently define TQM implementation in an identical concept by providing three different definitions within TQM implementation.

1. **Total** implies the search application for quality in every work aspect, from identifying the customer needs to aggressively evaluating the customer satisfaction. The goal, furthermore, turns the organization into a "total" quality system, in which the individual organizational members (managers and workers) are simply one more production component or human resource, for their responsibility in creating and shaping systems. Total also means that everyone in the organization must be involved in the continuous improvement efforts (including its customers and suppliers if feasible).
2. **Quality** means fulfilling and exceeding the customer expectations. In a broad way, it is everybody's responsibility in an organizational system to improve the acceptability of the product or service to the customer or client. Quality in short shows a concern for the customer satisfactions.
3. **Management** means developing and maintaining the organizational capacity to constantly improve quality. Inherence in an effective TQM implementation is the notions of teamwork and consensus fostering a more participative and collaborative

> work environment. TQM implementation purports to represent substantial advances over traditionally individualistic, competitive, and hierarchical organizational forms. In addition, management refers to people and processes needed to achieve the quality (ByeoungGone, 1997; Ho, 1997 cited in Sila and Ebrahimpour, 2003).

Another comprehensive definition of TQM implementation is provided by Terziovski and Samson (1999) as follows:

> "TQM implementation assists organizations to integrate business activities in leadership, people, customer focus, planning, and quality assurance of processes, information and analysis. These activities, when effectively linked together, would lead to sustainable world-class performance in customer satisfaction, employee relations, operating performance, and business performance" (Terziovski and Samson, 1999: p. 229).

TQM implementation requires a constant statistical measurement of quality to monitor performance. All members of an organization must become proficient in the use of statistics to the level required by their position or job (Gitlow *et al*., 2005). This means that an organization must conduct an extensive statistical training for all employees. TQM implementation is very different from these and other management practices. It recognizes that quality, as determined by the service provider, might be much different from quality as perceived by the service receiver. Dissatisfaction of customer to the service given indicates a deficiency of quality in product/service and respectively shows the failure of the product/service process itself (Gitlow *et al*, 2005). By the time TQM concentrates on the production of quality goods and fully satisfying customer expectations (in order to move closer to operating excellence in performing activity) and when it is also extended to employee efforts in all departments that may lack pressing, customer-driven incentives to improve; the biggest successes are achieved then. "It, later on, involves reforming the corporate culture and shifting to a total quality/continuous improvement business

philosophy that permeates every facet of the organization" (Amsden *et al.*, 1996 cited in Thompson *et al*., 2007: p. 396).

TQM aims at instilling enthusiasm and commitment to do things right from the top to the bottom of the organization. In striving for operating excellence (in order to sustain competitive advantage), many companies have also come to rely on three potent management practices: business process reengineering, Six Sigma quality control techniques, and sustainability of TQM implementation (continuous improvement and continuous innovation). It would seem that these three management tools have become globally pervasive techniques for implementing strategies manage to a cost reduction, defect-free manufacture, superior product quality, superior customer service, and total customer satisfaction. In other words, the right implementations of business process reengineering, *Six Sigma* control techniques and sustainability of TQM implementation program (continuous improvement and continuous innovation) are capable of contributing to operating excellence and better strategy execution (Thompson *et al*., 2007).

2.4.5.2 Sustainability of TQM Implementation Program

The present study can be classified as the 'how' of sustainability of TQM implementation in oil and gas industry in Indonesia. The researcher has attempted to comprehend and rationalize the structural relationships among QMPs, WCC, OE, company performance (CNFP and CFP). This research carries out several attempts to explore structural relations of these research constructs that make up the advantages of sustainability of TQM implementation in the oil and gas industry in Indonesia.

Since there is no defined end point for sustainability, Clark *et al.* (1997) assess sustainability by focusing on progress towards a system that survives and persists. Their ideas of sustainability are really predictions both for the future and for the systems (Costanza and Patten, 1995 cited in Clark *et al*., 1997). Nijkamp and Soeteman (1988) justify that the issue of sustainability is essentially much broader than that of environmental protection. According to Gorman and Krehbiel (1997) it has been much written about sustainability and sustainable development; for example, see Hart (1997), and Loucks *et al.* (1997). Sustainability requires that businesses use resources in ways that meet the needs of the enterprise and its stakeholders today, while protecting, sustaining, and enhancing future resources and the environment (Werbach, 2009).

Sustainability refers to an approach of an integrated system on economic, social, and environment. Loucks *et al.* (1997) have formulated this approach into three basic categories of sustainability principle (systems, values, and processes) *and* described Deming's 14 points in terms of the systems, values, and processes categories that classified the sustainability principles. Constancy of purpose (point 1) and adoption of the new philosophy (point 2) are the only points classified as values. Points 5 (improve constantly and forever the system of production and service) and 14 (put everybody in the company to work to accomplish the transformation) have broad implications and are the only two that Gorman and Krehbiel (1997) believed belong in all three categories. The remaining points (points 3, 4, 6, 7, 8, 9, 10, 11, 12, 13) belong to those in the systems and processes categories.

The notion of sustainability would also call for a more general (instead of a partial) and a more long-term or a program (instead of a short-term or a project) oriented policy

perspective. Both TQM and sustainability are the system approaches to management. Their differences lie on the boundary definitions of those systems. In TQM, the system boundary has typically been the individual organization, whereas in the sustainability model is the planet earth. In spite of these differences, both TQM and sustainability movements can be improved by mutual awareness. To make sustainable development program to be real, great improvement and innovation must take place. By practicing sustainability and TQM, organizations are able to maintain a dynamic equilibrium and regenerate systems to maintain their viability (Gorman and Krehbiel, 1997). The complementary between sustainability and TQM also envisages a system whereby economic growth and quality of life improvements occur in a unified system. Quality of life is a concept embracing physical (material) and non physical (cultural, social, and psychological) factors affecting living satisfaction (Gee, 1981).

The sustainability implementation of TQM program goes far beyond the quality movement (continuous improvement). Ultimately it is about continuously searching for organizational system (i.e. renewal and efforts to improve or continuous improvement) and sustains an organizational performance (continuous innovation) (Ahmad and Schroeder, 2002; Barney, 1991). According to the definitions of TQM implementation adopted in this study, TQM implementation comprises both dimensions of organizational structures (technical or mechanistic and social or organic dimensions). Tata and Prasad (1998) consider these two dimensions to be important in implementing TQM and introduce a model in relating culture and structure to TQM implementation involving a control-flexibility oriented culture (organizational value orientation) and a mechanistic-organic structure, as depicted in Figure 2.3. A flexibly-oriented culture and an organic structure correspond to success in TQM implementation (Irianto, 2005).

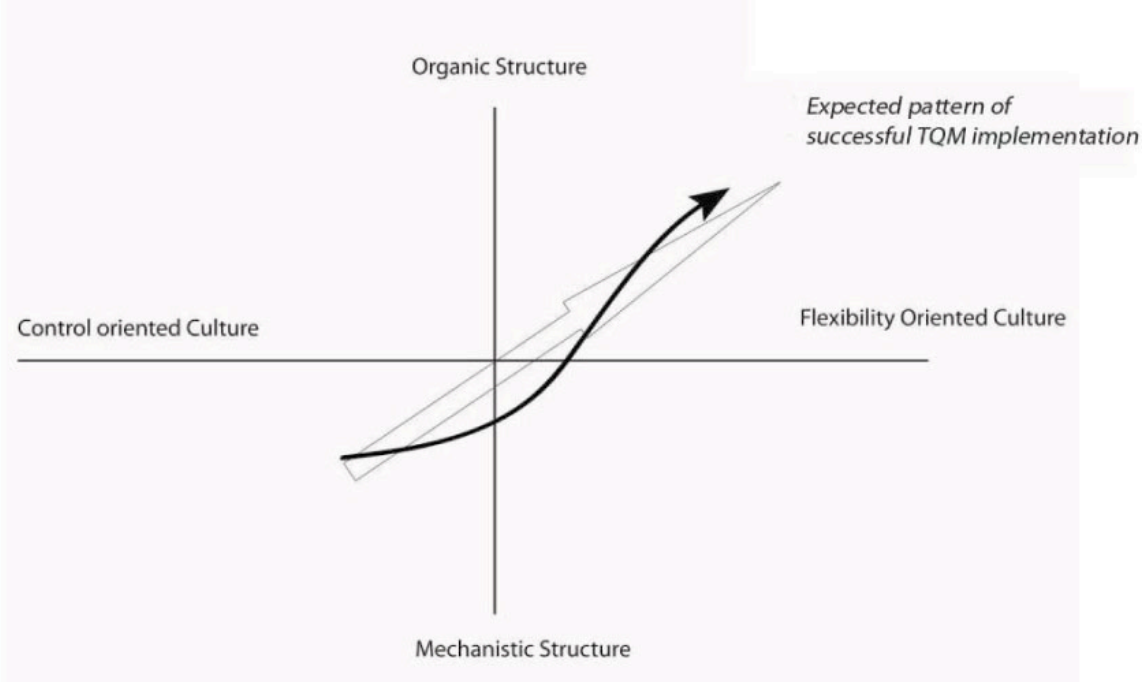

Figure 2.3
The Link between Culture, Structure and Implementation Success
Source: Irianto, 2005

The implementation of sustainability of TQM needs to change from a predominantly narrow and mechanistic approach, with quality basically rested on hard elements related to production or systematic measurement of standard operating procedure (SOP), to a softer or more social (organic and culture) procedure (McAdam, 2000 cited in Sa and Abrunhosa, 2007; Bou and Beltran, 2005). In fact, the mechanistic approach of TQM, by emphasizing stability, conformity, and discipline, does not introduce enough looseness into the system for people to explore new possibilities and collaborate with others. In contrast, the organic approach of TQM, by stressing on leadership, involvement, empowerment, partnerships, and comparison with the best in class (benchmarking), encourages people to scan the environment for new trends, information communication technology (ICT), knowledge management, and changes in the mindsets (continuous innovation) (McAdam, 2004 cited in Sa and Abrunhosa, 2007).

Sustainability of TQM implementation is a comprehensive management philosophy, embracing all the aspects of the organization and involving its entire workforce, as well as its customers and suppliers (Dale, 1994). Implementing sustainability of TQM program is expected to enhance organizational performance (sustainable competitive advantage). However, the effectiveness of this implementation should be realized by accessing and utilizing the concerted knowledge and experience of managers and employees at all levels (Kossoff, 1993 cited in Melan, 1998).

Since TQM is an organization-wide function, organization theory should be used to describe, explain, and improve it. Organization-theory research could contribute significantly to the practice of TQM and, in turn, improve quality performance and company performance (Benson *et al*., 1991). One of the organization theories is the "mechanistic-organic" approach. An effective sustainability TQM implementation program in an organization uses a combination of both mechanistic and organic approaches. Organizations are viewed as the instruments designed to efficiently achieve specified goals. As the contingency theory posits, mechanistic approach will be more useful in a more stable business environment, whereas organic approach will be more effective in a turbulent, dynamic and complex business' environment. This contingency theory is supported by Paul Lawrence and Jay Lorsch's work. After studying several firms in three different industries, Lawrence and Lorsch (1967) found that more effective firms have designs that matched their improvements in a manner suggested by figure 2.4 (Riyanto and Kismono, 1998).

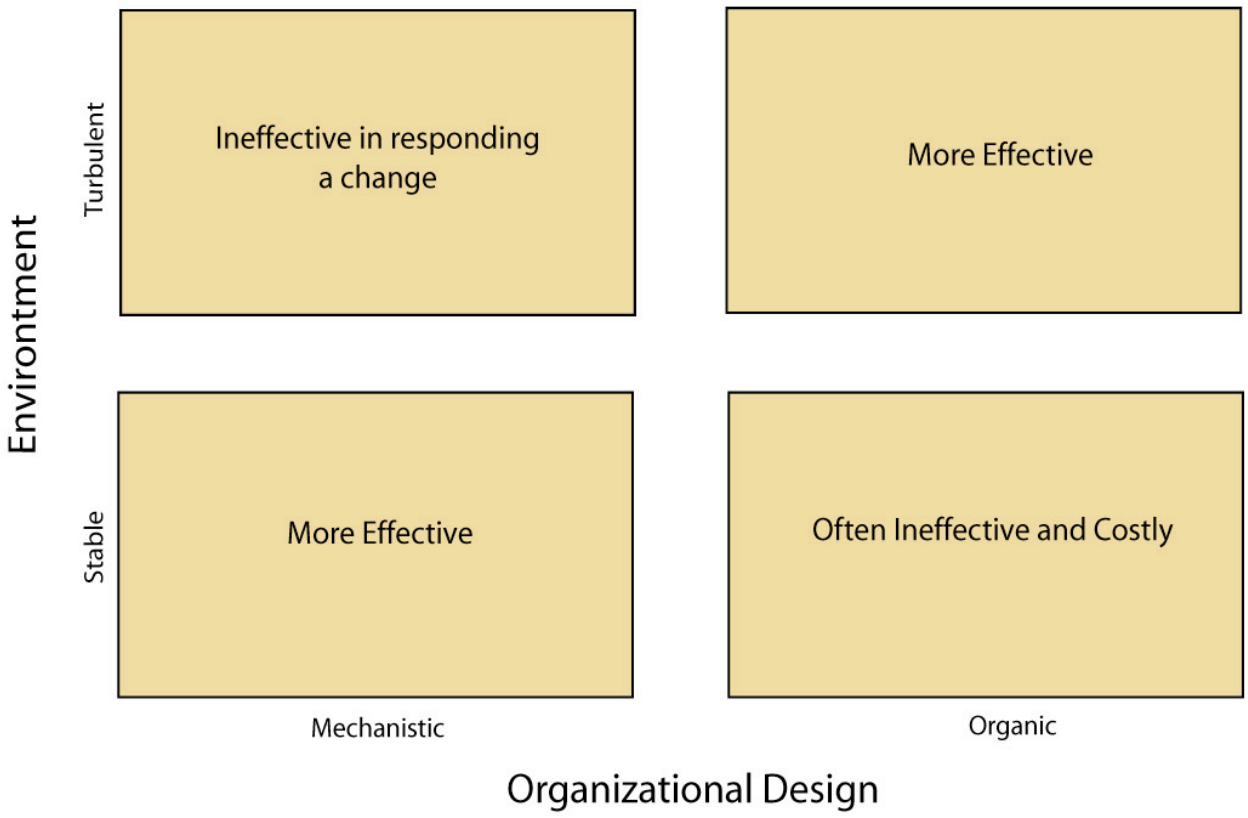

Figure 2.4
Suggestions about Organization Design of Lawrence and Lorsch
Source: Riyanto and Kismono, 1998.

Figure 2.5 and Figure 2.6 illustrate the organizational arrangements for mechanistic and organic approaches. As shown in Figure 2.5, the mechanistic approach is characterized by high specialization, rigid departmentalization, clear chain of command, narrow spans of control, a high degree of centralization, and a high degree of formalization (directive). On the contrary, Figure 2.6 shows that the organic model is characterized by cross-functional teams, cross-hierarchical teams, and free flow of information, wide spans of control, a high degree of decentralization, and a low degree of formalization (empowerment) (Burns and Stalker, 1961 cited in Riyanto and Kismono, 1998).

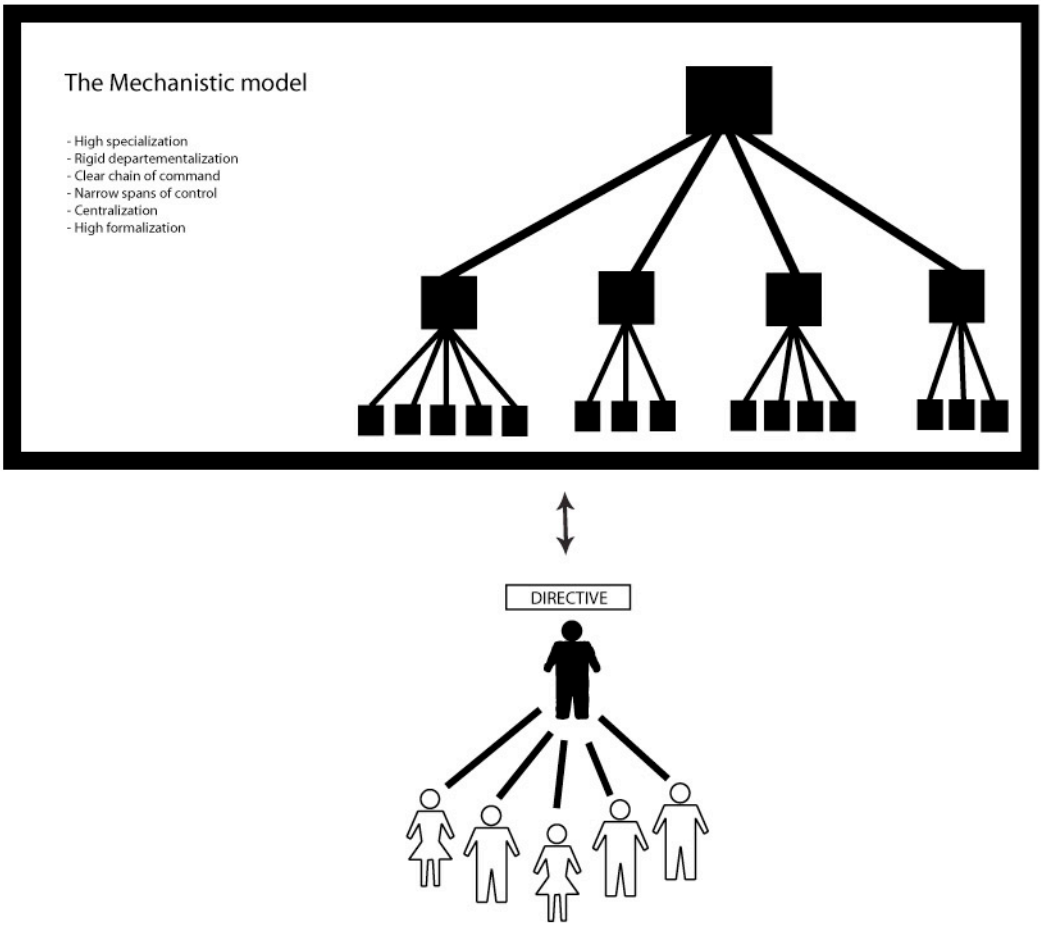

Figure 2.5
The Mechanistic Approach
Source: Riyanto and Kismono, 1998.

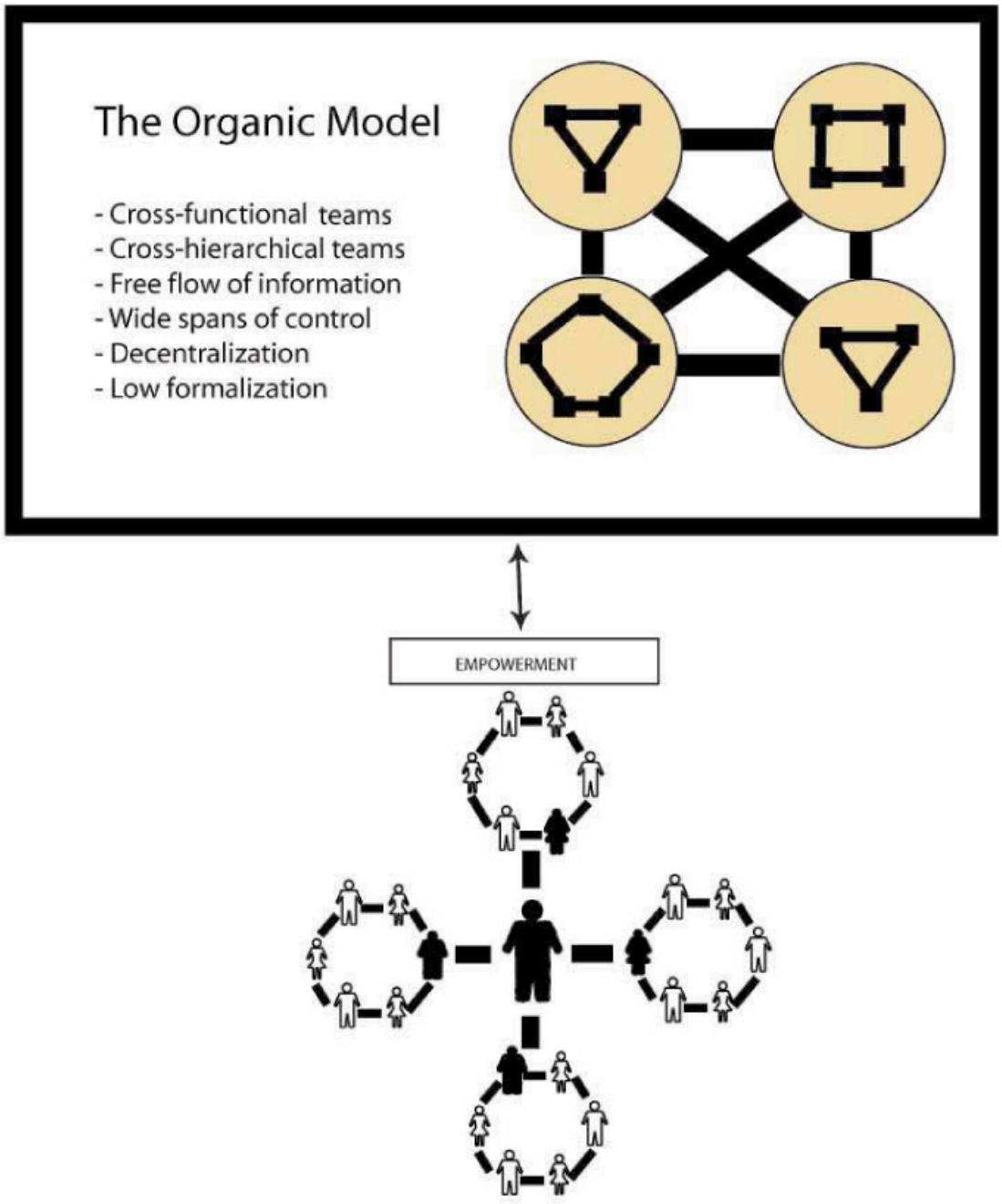

Figure 2.6
The Organic Approach
Source: Riyanto and Kismono, 1998.

The processes of TQM for the mechanistic (or machine) approach differ from the organic (or the organism) approach. (Beyer *et al*., 1997; Morgan, 1997). The mechanistic approach

assumes that individual behavior is only motivated by physical, secure, and economic motives. The motivation process is implemented through the use of fear and sanctions. In the mechanistic approach subordinates do not feel free to share their problems in work with their superiors, as opportunities given to the employees to solicit ideas and opinion are limited (Burns and Stalker, 1961).

The organic approach, on the other hand, has totally different assumptions with regard to human resources (employees' involvement and leadership in teams), as it assumes that employees' involvement and leadership in teams are the integral parts of organizational life. Consequently, organizations should pay attention to employees' involvement by taking part in all activities related to the improvement of quality. However, leadership in teams through cross-functional team relationship goes beyond the nature and dynamism of employees' involvement or the relation of leader-follower (relational approaches combine transactional and transformational leadership) (Gonzales and Guillen, 2002). Cross-functional teams offering many potential benefits to an organization are increasingly being used in organization to improve a coordination of interdependent activities among specialized subunits. The teams allow flexible, efficient deployment of personnel and resources to solve the discovered problems. An effective leadership (the combination of transactional and transformational leaderships) is required to meet the challenges inherent in the development of the cross-functional teams (Ford and Randolph, 1992; Manz and Sims, 1993, Yukl, 2006).

Spencer (1994) proposed that the definition of quality under the mechanistic model is related to conformance to internally generated standards, whilst under the organic model, customer satisfaction would be emphasized. Further, the role of employees under the

mechanistic would be interpreted in more passive and order following terms, whilst under the organic model, a greater use of self control and adjustment would be expected in carrying out tasks (Moore and Brown, 2006). Table 2.5, adapted from Spencer (1994, p. 459), summarizes the comparison of the two models.

Table 2.5
Comparison between Mechanistic Model and Organic Model

Dimension	MechanisticModel	Organic Model
Organizational goals	Efficiency/ performance goals	Organizational survival (requires performance)
Definiton of quality	Conformance to standards	Customer Satisfaction
Role/nature of environment	Objective/outside boundary	Objective/inside boundary
Role of management	Coordinate and provide visible control	Coordinate and provide invisible control by creating vision/system.
Role of employees	Passive/follow orders	Reactive/self-control within system parameters.
Structural rationality	Chain of command (vertical communications)	Process flow (horizontal and vertical communication)
Philosophy toward change	Stability is valued but learning arises from speculation	Change and learning assist in adaptation.

Source; Adapted from Spencer (1994, p.459)

Spencer (1994) also suggested that the implementation of TQM may be viewed, in terms of a "methodology for use", along seven basic doctrinal dimensions as shown in Table 2.6. These seven dimensions arguably provide not only a useful device, but also an effective framework for collating and analyzing evidence garnered from the actual experience of TQM (Moore and Brown, 2006).

Table 2.6
Seven Dimensions of TQM Doctrine

TQM doctrinal dimension	Doctrinal content
Goal	TQM established quality enhancement as a dominant priority and one that is vital for long-term effectiveness and survival. Improving quality can decease rather than increase costs and facilitate attainment of other demands and objectives.
Definition of Quality	Quality is satisfying or delighting the customer. All quality impovement initiatives must begin with an understanding of customer perceptions.
Role/nature of environment	TQM blurs the boundaries between the organization and the environment. Entities previously regarded as outsiders (e.g. suppliers, customers) are now considered part of the organizational processes
Role of Management	Management's role is to create constancy of purpose for quality improvement of products and services (Deming, 1982), and to devise a system that can create quality outcomes. Managers and the systems rather than the workers, have the responsibility for poor quality outcomes (Juran, 1991; Ross, 1993)
Role of Employees	Employees are empowered to make decisions, build relationships, and take steps needed to impove quality within the system designed by management. Additional training and educational opportunities provide necessary skills for this broader role.
Structural rationality	The organization is reconfigured as a set of horizontal processes that begin with the supplier and end with the customer. Teams are organized around processes to facilitate task accomplishment.
Philosophy toward change	Change, continuous impovement and learning areencouraged. Ideally, allorganizational members are motivated to impove the *status quo*

Source: Adapted from Spencer (1994, p. 447)

Sustainability of TQM incorporates both ‘hard’ (mechanistic) aspects—such as SOP and work design; and ‘soft’ (organic) aspects—such as leadership, involvement, and empowerment committed to stakeholder satisfaction through the continuous improvement and innovation. In addition Bou and Beltran (2005) cited that the sustainability

implementation of TQM needs to change the work behaviour of the employees. In this sense, since the entire workforce (i.e. for oil and gas industry from upstream to downstream sectors) is responsible for quality, the organizational culture should change towards a climate where employee trust, commitment, and participation effectively increase (Kufidu and Vouzas, 1998; Mohrman *et al.*, 1995; Wilkinson *et al*., 1991 cited in Bou and Beltran, 2005).

According to Prajogo and Sohal (2004), sustainability of TQM needs to be implemented and aligned with the company's business strategy. In addition, organizations need to pursue multiple aspects of performance, including quality (quality management practices) and innovation (world-class company and operational excellence practices) simultaneously. Prajogo and Sohal (2004a) also suggest an interrelation between quality and innovation as a cumulative performance rather than as a trade-off between the two, and only those that are capable of synergistically managing both will survive in the next global competition (Corbett and Van Wassenhove, 1993; Thompson, 1993/1994; Wheelwright and Clark, 1992).

The emphasis throughout all stages of sustainability of TQM implementation should involve all managers and employees in problem-solving, decision making, and non-financial and financial success of the firm (Yusuf *et al.*, 2007). It means that sustainability of TQM implementation encourages people at all levels to become more closely related to the long-term organization's goals (Collard, 1989 cited in Yusuf *et al.*, 2007). It also requires employee involvement and empowerment to continuously improve quality and increase the quality of life. Sustainability of TQM implementation afterward should be implied not only in all stages but also in almost every aspect of human being, such as

leadership and commitment, developing teamwork or cross-functional relationship, recognition and reward system.

According to Ahmad and Schroeder (2002), organizations launching TQM initiatives with great enthusiasm is merely to achieve performance improvements that are short-lived. These organizations consequently fail to sustain continuous improvement and innovation efforts and, thereby can not remain competitive in their industries over long term (to sustain competitive advantage). Factors such as lack of top management support and/or employee empowerment, being failed to create a conductive culture, or inconsistent human resource management policies (e.g. reward/recognition and punishment), have been considered as the factors to contributing to TQM failures (Dayton, 2001; Shin *et al.*, 1998 cited in Ahmad and Schroeder, 2002). Following the same reasoning, it has been argued that top management's ability and support to create a vision and promote change is at the heart of successful TQM implementation (Puffer and McCarthy, 1996 cited in Reed *et al.*, 2000). In other words, top management highly needs certain transformational leadership skills.

In the following subsections, the researcher will describe the characteristics of successful and unsuccessful TQM implementation, which have already been done by worldwide organizations in the past two decades in developing benchmarking studies (Nwabueze, 2001; Usilaner, 1992). A good understanding of these characteristics potentially can significantly assist the development of sustainability of TQM implementation model for oil and gas industry in Indonesia.

1) **Characteristics of the unsuccessful TQM implementations.** Not all the implementation of TQM has been successful as expected. Researchers like Ahire *et al.*

(1996a), Brown *et al*. (1994), Cullen (1991), Porter and Parker (1993), and Smith *et al.* (1994) suggested that the primary reasons offered for TQM success/failure are leadership, management commitment and involvement, established need and strategic (long-term) view.

These researchers additionally reveal that the unsuccessful implementation of TQM has suffered in U.S. industry. Many reasons are suggested for this failure, ranging from an improper understanding of TQM, lack of top management support to inflexibility of the corporate culture. A serious gap then emerges between what actually is espoused as TQM and what actually is being implemented (Laza and Wheaton, 1990). Top management begin to realize that TQM delegates quality to quality czars and experts rather than to real people (employees)—TQM is just lip service or a rhetoric project (Yukl, 2001; Zbaracki, 1998). In addition, TQM program could not be delegated. It must be central to company strategy, smart operations system (cross-disciplinary, cross-departmental teamwork efforts which include internal and external customers), and clear individual job roles and careers (Reger *et al*., 1994; Sashkin and Kiser, 1993).

One of these researchers (Imai, 1986) stated that the failure in a continuous process improvement and innovation program occurred in the company has made the management tends to put all blames on quality problems (errors, mistakes, or failures) to the employees. Conversely, a continuous process improvement and innovation truly positions the whole organizations—managers and employees, and all functions— to be responsible for the consequences in quality practices (management and employee's involvement and empowerment). It is essential to know why TQM implementations fail and how to correct

the causes of failure—as a feedback loop mechanism for continuous process improvement in learning process as well (Handfield, 1989).

2) **Characteristics of successful TQM implementations**. As stated earlier several researchers suggested that top management has played a significant role in establishing and maintaining any type of corporate culture, its leadership behavior and also personality aimed at a success in the TQM philosophy implementation. TQM, at this point, needs top management leadership, visibility, and sustained commitment over the long-term process. Imai (1986) states that the most crucial elements in the *Kaizen* process are the commitment and involvement of top management. Usilaner (1992) in his study also stresses that an activecommitment of all top management is needed to register on the successful TQM implementation. He identifies the following differences between organizations that experienced benefits from TQM and those that were failed to achieve any lasting benefits (Grotevant, 1998). Table 2.7 shows the characteristics of successful and unsuccessful TQM implementation program.

Table 2.7
Characteristics of Successful and Unsuccessful TQM Implementation Programs

Characteristic of Successful TQM Implementation Programs	Characteristics of Unsuccessful TQM Implementation Programs
1. Active top management leadership and commitment	1. Minimal top management support
2. TQM considered to be permanent change in an organization's culture, structure, and processes	2. Failure to recognize the need for fundamental change with accompanying emphasis on TQM training, tools, and techniques
3. Well defined and widely communicated organizational strategies	3. Lack of overall organizational strategy
4. TQM concepts integrated into the fabric of the organization with well-established reward and recognition programs	4. Minimal integration of TQM with existing processes, and strategies
5. Persistent, long-term objectives and results	5. Expectations of quick results not achieved or sustained over time

Source: Grotevant, 1998

These findings are highly related to this study, especially the finding of the characteristics of a comprehensive TQM implementation model or program, which is a family of change strategies, rather than an end in and of itself (Grotevant, 1998). A comprehensive TQM implementation model for oil and gas industry, in particular, recognizes TQM not only as an independent transformation strategy but also as a useful adjunct or follow-up to more contextual factors of an organization (i.e., WCC and OE).

The characteristic of TQM implementation program encourages organizations to address quality on a broad range of contextual issues (i.e., WCC and OE). Companies that wish to compete for the world-class standards must produce evidence of leadership and commitment, initiate verifiable cross-functional communications, address the happiness and well-being of the workforce through reward and recognition and, above all work toward achieving long-term objectives (Curkovic*, et al.,* 2000; Usilaner, 1992).

The next subsection, the researcher describes the relationships among critical factors of quality management practices, company performance and competitive priorities.

2.5 Critical Factors of Quality Management Practices, Company Performance, And Competitive Priorities

One potential determinant of the relative information content of alternative performance measures is the business strategy of a firm. Prior research argues that the performance measures used in TQM practices should be closely linked to the organization's strategy to ensure that commitment of the managers are aligned with the company's competitive strategy (e.g. Salter, 1973; Govindarajan and Gupta, 1985; Simons, 1987 cited in Ittner *et al*., 1997). The corporate strategy literature strongly suggests that a competitive strategy can be broadly conceptualized as a continuum between two different strategic orientations (Miles and Snow, 1978; Porter, 1980). "Basically, organizations are characterized either as *prospectors* or as *defenders. As prospectors*, organizations are exhibiting a *differentiation* strategy attempting to identify new product/service market opportunities, quickly adapting to changes in the external environment and following a "*first-to-market*" strategy in order to gain a maximum profit. *As defenders*, organizations are exhibiting a *cost leader* strategy attempting to provide a stable set of products and services to a well-defined portion of the total market while emphasizing improvements in current operating efficiencies in order to lower costs" (Ittner *et al*., 1997: p. 233).

The primary goal of defender firms in increasing operating efficiencies is relative to the previous period, short-term, retrospective financial measures such as cost control, operating profit, cash flow from operations, or return on investment that are relatively informative measures of managerial performance (Miles and Snow, 1978; Simons, 1987; Govindarajan and Fisher, 1990 cited in Ittner *et al*., 1997). In contrast, the desired managerial actions of prospector firms (e.g. market-share increases or new product development) may take substantial time to be revealed in financial results, making short-run financial performance

measures, such as annual operating profits, relatively uninformative about managerial effort on those dimensions. Consistent with these strategic objectives, Govindarajan and Gupta (1985) find that SBUs following a "build" (or prospector) strategy, highly rely on non-financial criteria (e.g., new product or personnel development) than those following a "*harvest*" strategy (a classification similar to a defender strategy). Similarly, Simons (1987) finds that SBUs following a defender strategy tend to compensate their managers to be more frequently using the merit pay system – a function of predetermined financial budget targets. This means that a competitive strategy plays an important role in the choice of performance measures by focusing on business unit managers and examining a self-reported importance of various performance measures (Ittner *et al*., 1997).

The defender-prospector continuum represents a general characterization of a competitive strategy. A more specific strategic choice that has prompted widespread calls for the use of non-financial performance measures to be the adoption of TQM initiatives. According to the quality management literature, successful TQM implementation requires a greater reliance on non-financial performance measures in order to foster management commitment to the quality program, to communicate the significance of TQM to all organizational members, and to ensure that quality improvement results are elevated to the same level of importance as financial performance—*strategic quality management* (Daniel and Reitsperger, 1991; Pfau and Gross, 1993; Ittner and Larcker, 1995; Madu and Kuei, 1993). Since the benefits from current quality improvement activities may not be fully reflected in short-term financial measures (Anderson *et al*., 1994; Ittner and Larcker, 1996), non-financial performance measures provide additional information regarding current company performance (Hauser *et al*., 1994).

As organizations have strived to become world-class performance in operations (WCC and OE) by improving their products and processes and attaining the greater customer satisfaction; their measurement systems of company performance have lagged behind the operational improvements achieved (Vickery *et al*., 1993; Vokurka and Fliedner, 1995). In an attempt to assess world-class performance in operations, organization still relies on the measures of cost and efficiency, whereas indicators such as quality, time, service (Klassen and Whybark, 1999; Stonebraker and Leong, 1994; Cokins, 2004) would be more appropriate performance measures. It is important that the measurement system be continually reviewed and revised as the global environment and economy change. Company performance measurement has always been difficult, and changes have made it more difficult indeed (Maani, 1989; Santori and Anderson, 1987). Performance measurement afterward needs to provide information on activities with respect to meeting customer expectations and strategic goals (Hendricks and Singhal, 1996; Phillips *et al*., 1983).

Although many authors have attempted to set out a clear definition of performance, the debate currently continues in the academic literature, especially concerning with some aspects of terminology, analysis level, and conceptual basis for assessment (Ford and Schellenberg, 1982). Venkatraman and Ramanujan (1986) consider three different levels of performance within organizations, those are financial performance, business performance, and organization effectiveness. These performances have been subsequently known as organizational or company performances (e.g. Chu-Hua *et al*., 2001; Terziovski and Samson, 1999 cited in Montes *et al*., 2003). The present work studies a relationship between TQM and performance on a broad sense, and for this reason, this research focuses on a relationship between QMPs and company performance (CNFP and CFP).

Performance can be defined in many different ways (Eriksson and Hansson, 2003). This research is using the definition provided by EFQM (1999), which defines performance as a measure of attainment achieved by an individual, team, organization or process (Eriksson and Hannson, 2003). This study, from many different indicators to measure the performance (Eriksson and Hansson, 2003), sets out to measure the impact of QMPs on CNFP and CFP. Condrey (1994), Wright and Geroy (2001), and Cokins (2004) describe that world-class performance should combine the financial and non-financial factors to improve the productivity of the organization. Without a combination of both factors, the employee is not likely to be effective (Morse and Wagner, 1978). The non-financial factors (management style analysis, human resource management system, job cost, organizational development methodology, feedback/participation system, training and development methods, career development plans and processes) need to be supported by financial factors (cost accounting practices)—(industrial engineering, ergonomics, job design, physical plan engineering and maintenance, information technology, and on the job training), as employees must be supported by the tools and a conductive environment to an effective organizational performance.

In light of increased competition and the market-driven nature, it requires oil and gas companies to constantly upgrade their company performance through its connections with TQM implementation. A successful TQM implementation model is a multidimensional concept that embodies the contextual factors of an organization (Sadikoglu, 2004). Because the contextual factors of an organization (i.e. WCC and OE) have not been given much importance and consideration (Shah and Ward, 2003), the researcher considers these two contextual factors as the appropriate ones for this study.

According to Kanter (1995) and Kay (1993) success could be achieved from the ability of the whole spectrum of the company both internally and externally to meet world-class standards and maintain an excellence performance. Thorne and Machrcey (2000); Basu and Wright (1996) meanwhile define world-class performance as a capability in creating a consistent standard of excellence performance transcending the global (geographical) boundaries. Manufacturers, in its turn, must compete against world-class companies. It only follows that a manufacturer's ability to compete, and to survive will depend on its ability to achieve world-class standards (Basu and Wright, 1996; Shillito, 1994). The argument indicates the needs to be a marriage of world-class requirements as the contextual factors for oil and gas companies (i.e. WCC and OE), and success in gaining a fraction of the global competitive advantage.

Rockart's *critical success factor* (CSF) approach discusses the concept of "critical factors" in management literature (Rockart, 1979). Rockart (1979, 1982) and Freund (1988) define the critical factors as the limited number of areas in which results—if they are satisfactory—will ensure successful competitive performance for the organization (Soliman *et al.,* 2001). They are the few key areas where "*things must go right*" for the business process improvement. Amberg *et al.*, 2005 argue that managers need appropriate information and should provide a disclosure and financial transparency on their management functions/operating processes; and that performance in each area should be measured continually. "The performance of processes does not immediately improve or degrade—it changes gradually" (Cokins, 2004: p. 11). It follows that such information should be made available by organizations, as necessary, for enhanced company performance. In addition a comprehensive set of CSFs of TQM or QMPs is needed to make better improvement efforts in the organization. Improvements will occur in quality

performance and ultimately result in improved non financial (value gain) performance and financial (monetary gain) performance for the organization (Cokins, 2004).

Attempts are also needed to develop successful TQM implementation model for oil and gas industry. This study investigates several interrelationships among ten research constructs (six QMPs, WCC and OE, and two types of company performance—CNFP and CFP).

Dave and Buschmann (1998) stated that the goal of world-class performance is to reduce total operating costs, improve productivity in an already well-understood critical factors of TQM implementation and enable previously unavailable world-class company practices strategic capabilities. TQM implementation should consider another contemporary management as an integrated network management system (Ashmore, 1992; Cua *et al*., 2001). The study additionally brings together various themes to summarize the main principles underlying TQM in an attempt to develop a sequential TQM implementation framework. This emphasis reflects not only the developing importance of quality management practices but also the softer aspects of world-class company and operational excellence practices as an integral part of successful TQM implementation model for oil and gas industry.

The importance of adopting a set of suitable performance measures by a company has long been recognized and is well documented (Kaplan and Norton, 1992; Sinclair and Zairi, 1995; Neely, 1999 cited in Kumar *et al*., 2008). Performance measurement is highly important for an effective management of an organization (Demirbag *et al*., 2006). Proper performance measurement is believed to support formulation of company strategy, management of business processes and change, communication, resource allocation,

employee motivation, and long-term success (Sinclair and Zairi, 1995; Bourne *et al*., 2000 cited in Kumar *et al.*, 2008). According to Deming (1986), without measuring something, it is logically impossible to improve the performance of organization. Hence, one needs to determine the extent of QMPs and measure their impacts on company performance (Madu *et al*. 1996; Gadenne and Sharma, 2002). Among the TQM proponents, the work of Deming (1982, 1986) perhaps becomes the most relevant to understanding the connections between total quality (QMPs) and work performance and the management of such performance (company performance) (Waldman, 1994).

In the late 1980s and 1990s many researchers and practitioners expressed a general dissatisfaction with traditional performance measurement systems (developed from costing and accounting systems) identified their shortcomings and argued for a change (Johnson and Kaplan, 1987; Fry and Cox, 1989; Kaplan and Norton, 1992 cited in Kumar *et al.*, 2008). The need to adopt a balanced range of financial and non-financial performance measures into company performance is nowadays widely accepted. Proper performance management is especially important for companies in implementing TQM. Performance measurement is considered as one of the dimensions of TQM and a critical success factor for TQM implementation (Bititci *et al.*, 1997; Mehra *et al*., 2001; Brah *et al*., 2002; Taylor and Wright, 2006 cited in Kumar *et al*., 2008). An improper performance measurement can undermine all TQM philosophy and prohibit the company from gaining the expected benefits from TQM implementation (Goodman *et al.*, 1994; Najmi and Kehoe, 2001; Chang, 2005, 2006 cited in Kumar *et al.*, 2008). On the other hand, proper performance measurement can lead to employee motivation, ability to respond to market demand on time, and overall improvement of business processes (Bititci *et al.*, 1997 cited in Kumar *et al*., 2008). Organizations wishing to implement TQM, therefore, face a necessity of

profound changes in performance measurement and are in need of guidance and better understanding of the role of different performance measurement methods and systems (Sinclair and Zairi, 1995; Kumar *et al*., 2008).

Designing and implementing an effective performance measurement system in the TQM context somewhat are not a straightforward task. Numerous authors accordingly tried to provide several guidelines and recommendations for TQM adopters (Kumar *et al.*, 2008). Kaplan and Norton (1992) stated that "an effective performance measurement system should provide timely, accurate feedback on the efficiency and effectiveness of operations" (Kumar *et al*., 2008). To be effective, a performance measurement system, as a consequence, must be based on the drivers of organizational success, which in the perspective of company performance includes both CNFP called *value-gain* (quality of product/service, delivery of product/service, variety of product/service, customer satisfaction, employee satisfaction, community involvement) and CFP called *monetary-gain* (financial performance—net income, profits, profit margin; market performance—increased market share, sales volume; and operating costs and efficiency) (Carpenter and Sanders, 2007; Cook and Verma, 2002). The long-term goals of TQM performance measurement should include a continuous improvement of performance and maximization of customer satisfaction by adapting to change in customer requirements and the general business environment (Kumar *et al.*, 2008). Implementation of performance measurement in the context of TQM depends on many factors: leadership, quality planning, specialized training, supplier management, process management, and continuous improvement and learning (Claver *et al*., 2003 cited in Kumar *et al.*, 2008).

Despite the vast existing research on performance measurement in TQM context, the empirical researches that investigate what performance measures are actually being used by the TQM adopters and how these companies perceive their appropriateness are still limited. This study applies the following two performance measurement systems applied in TQM implementation in the oil and gas industry in Indonesia; namely company financial performance and company non financial performance. Carpenter and Sanders (2007); Cook and Verma (2002) summarize some relevant company financial performance and company non financial performance outcomes in Table 2.8.

Table 2.8
Company Financial and Non Financial Performance Metrics

Company Financial Performance (Monetary- Gain)	Company Non Financial Performance (Value-Gain)
• **Financial Performance (price** dimension of competitive priorities):	➢ Quality of Product and Service Offerings (**Quality** and **Innovativeness** dimensions of competitive priorities)
Net Income	➢ Delivery of Product and Service Offerings (**Delivery** dimension of competitive priorities)
Profits	➢ Variety of Product and Service Offerings (**Flexibility** dimension of competitive priorities)
Profit Margin	➢ Customer Satisfaction (**Service** dimension of competitive priorities)
• **Market Performance (price** dimension of competitive priorities):	➢ Employee Satisfaction (**Service** dimension of competitive priorities)
Increase Market-share	➢ Community Involvement, empowerment, and development (**Service** dimension of competitive priorities)
Sales Volume	
• **Operating Performance** (**low cost** dimension of competitive priorities)	
Operating Costs	
Efficiency	

Source: Carpenter and Sanders, 2007; Cook and Verma, 2002; and Zhao *et al*., 2002

Cook and Verma's study (2002) conceptualizes the company performance based on two dimensions. The first dimension is related to the financial or monetary gain performance (i.e., net income, profit, profit margin, sales volume, market share enhancement, cost

reduction, and efficiency). The second one is related to the non financial or value gain performance (i.e., product/service quality enhancement, delivery performance, customer and employee satisfaction, and community development impacts). An organization must translate the customer requirements into objectives for operations known as *competitive priorities*, which commonly include low cost, quality, delivery, and flexibility (Ward *et al*., 1998; Zhao *et al*., 2002). It has been widely accepted that those competitive priorities in manufacturing can be expressed by, at least, four basic factors; namely cost, quality, delivery, and flexibility (Fine and Hax, 1985; Hayes and Wheelwright, 1984 cited in Zhao *et al*., 2002). With the severe competition in the global marketplace, product life cycle is becoming increasingly shorter; so a fifth factor, *innovativeness*, is now becoming a critical factor in determining the success of a company (Leong *et al*., 1990). It is commonly known that the first innovative product available in the marketplace can usually be sold at a higher profit margin (Zhao *et al.*, 2002). The shorter the new product released, the earlier the product is available in the market, thereby creating a longer period for the first launcher to enjoy a higher profit. That is why many researches and development departments in leading manufacturing companies are racing against time.

Today, customers through internet could have more choices and a better bargaining position with their suppliers. They can demand lower cost, better quality and delivery, and higher flexibility in meeting their design specifications and delivery schedule intended. Moreover they could demand better customer services, which include new product information, quotation, sales order status, product availability and after sales services. More value-added services for customers (both internal and external) are now becoming one of the key factors in determining competitive priorities. To achieve higher customer services, many companies have installed a *customer relationship management* (CRM) system, which

is integrated with their *enterprise resources planning* (ERP) systems. It is aimed to provide real time information to their customers. Furthermore, applications of intelligent information technology make it possible to perform *one-to-one* marketing and to predict individual customer's needs (Zhao *et al*., 2002). In this research, the researcher also includes the service dimension (customer satisfaction, employee satisfaction, community involvement, empowerment and development) in the list of competitive priorities. The items of company performance (non-financial and financial as illustrated in Table 2.8) included in this study are basically adopted from the questionnaires used in Cook and Verma's study (2002), and Zhao *et al*.'s study (2002).

Traditionally, a company performance has been measured by using financial indicators, which may include net income, profits, profit margin, market-share, sales volume, operating costs, and efficiency. Kaplan and Norton (1996)—the original idea generator of the balanced scorecard—emphasize that financial indicators would measure only past performance. Therefore, in order to overcome potential shortcomings of traditional organizational (company) performance systems, they add non-financial categories to the traditional performance measurement system. For the financial measures, managers afterward are encouraged to consider the measures drawn from other three perspectives of the business: *Learning* and *Growth*; *Internal Business Process*; and *Customer*, chosen to represent the major stakeholders in a business (Mooraj *et al*., 1999). Cokins (2004) argues that implementing a balanced scorecard as blending non-financial and financial measures for balanced emphasis is the ultimate solutions. However, "balanced scorecard implementations often fail to deliver anticipated benefits because they are not integrated with management processes, particularly those used at an operational level" (Cokins, 2004: p. 2). The balanced scorecard's critical role is that it puts the measures (key performance

indicators, or KPIs) in the context of strategy. "With strategy-linked measures reported through scorecards, it automatically can explain not only about what happened but also about where that leads to and why it is important" (Cokins, 2004: p. 42). By combining financial measures and non-financial measures in a single report, the *Balanced Scorecard* aims to provide managers with richer and more relevant information about activities they are managing than the one provided by the financial measures alone.

There is a relatively large body of empirical studies that measures the company (business) performance by TQM criteria (Samson and Terziovski, 1999; Flynn *et al.*, 1994; Wilson and Collier, 2000; Fynes and Voss, 2001; Flynn and Saladin, 2001; Montes *et al*., 2003; Benson *et al*., 1991; Choi and Eboch, 1998). These studies explore a variety of theoretical (conceptual) and empirical (contextual) issues. If TQM plan is properly implemented, it will produce an impact on a wide range of areas including understanding customers' needs, improving customer satisfaction and internal communication, better problem solving and fewer errors (Demirbag *et al*., 2006). The combination among these improvements eventually leads to increased sales, market penetration, and higher profits and returns (Cokins, 2004). Choi and Valikangas (2001) argue that TQM is an important tool, yet to create sustainable value, it should be coupled with more innovative and forward-looking strategies (the contextual factors of an organization). In a review of the evolution of TQM, Gehani (1993) describes the contextual factors of an organization (*innovation management practices*) as the next quality frontier where firms focus on quality-performance based on value-added activities. The alignment between QMPs and the contextual factors of an organization are needed to facilitate a better company performance (non-financial and financial) (Cobbold and Lawrie, 2002).

Many studies have demonstrated a positive and direct relationship between TQM practices and company performance. In the following subsections, the researcher investigates the relationship between quality management practices and company performance. First, the researcher examines the relationship between the QMPs and their effect on both CNFP and CFP. Next, the researcher investigates to what extent CNFP mediates the relationship between QMPs and CFP.

2.5.1 TQM Implementation and Company Financial Performance

The question whether an adoption of TQM improves the financial performance has been discussed for several years (Eriksson and Hansson, 2003). Several various studies have been conducted to examine the impact of TQM on financial performance, but empirical studies investigating the relationship between TQM practices and financial performance have produced mixed results. These studies either use stock price performance (Hendricks and Singhal, 1996, 2001; Easton and Jarrel, 1998) or perceptual measures developed by the researchers themselves (Powell, 1995; Kaynak, 2003; Samson and Terziovski, 1999; Prajogo and Sohal, 2006).

Hendricks and Singhal (1996) studied award-winning companies (as a proxy for TQM implementation) to establish the relationship between TQM and stock price performance but it found no evidence of long-term company performance. In contrast to the findings of Hendricks and Singhal (1996), Easton and Jarrel (1998) found a significant relationship between stock-price performance and TQM implementation. A follow up study by Hendricks and Singhal (2001) with a larger dataset revealed that in the post implementation period, the sample of effective TQM implementers significantly outperformed the various matched control groups. Douglas and Judge (2001) used the perceptual measures of

financial performance (alongside with expert rated performance measures) whose results indicate that the level of TQM implementation was positively and significantly related to both perceived financial performance of a hospital and its industry-expert rated performance. It appears that the degree to which the entire TQM philosophy is implemented is strongly correlated with the financial performance perception (Kaynak, 2003).

Bergquist and Ramsing (1999) argue, on the other hand, that it is difficult to establish a relationship between TQM and the performance of the company. Some results have been published as well, presenting a more negative picture of TQM implementation benefits. Eskildson (1994) states that, based on survey results, many organizations failed to implement TQM. Harari (1993), additionally, argues based on his own experience, that TQM programs are ineffective, and that at best one third of the TQM programs have achieved significant improvements (Eriksson and Hansson, 2003). The approaches used to determine the benefits of TQM programs, and to find a relationship between TQM and company performance (CNFP and CFP) are also different among the studies (Eriksson and Hansson, 2003).

2.5.2 TQM Implementation and Company Non Financial Performance

Although a financial performance is generally accepted as an ultimate aim of business organizations, non financial performance indicators are also equally important in implementing TQM principles. Quality management practices may not only affect financial performance directly (Kaynak, 2003), but also indirectly increase innovation (Sing and Smith, 2004), changing organizational culture (Irani *et al*., 2004), market competitiveness (Chong and Rundus, 2004), overall organizational performance (Powell, 1995), market-

share and market-share growth (Kaynak, 2003), employee morale (Rahman and Bullock, 2005), and productivity (Kaynak, 2003; Rahman, 2004). Prajogo and Sohal (2001) report two main arguments on the relationship between TQM and innovation where the first argument suggests that TQM is positively related to increasing innovation capacity of TQM practicing firms. The second argument, however, focuses on the negative relationship between TQM implementation and innovative performance of firms. The logic behind this argument is that customer focus and its principles may trap organizations into the captive markets where they only focus on existing customers, which may result in ignoring the search for innovation and novel solutions (Prajogo and Sohal, 2006). Samson and Terziovski (1999) found support for the relationship between some non-financial measures (i.e. export growth, market share growth, innovation growth, cost and quality) and implementation of TQM practices (Demirbag *et al*., 2006).

2.5.3 Relationship between Company Financial and Non Financial Performance

A relationship between financial and non-financial measures of organizational performance has long been discussed in organization and strategy literature. Hackman and Wageman (1995) provide an insightful account of conceptual and practical issues in researching TQM implementation and change. York and Miree (2004) argue that non-financial performance such as improved quality, innovativeness and increased market share should actually reduce costs to bring a positive effect on measures of financial performance. Although the studies of oil and gas industry performance and TQM relations do not examine non-financial performance measures directly, evidence from larger organizations supports the argument that operational performance indicators are tightly related to financial performance dimensions (Fuentes-Fuentes *et al*., 2004). Some other studies also demonstrate a positive relationship between operational performance dimensions such as product quality (Larson

and Sinha, 1995), innovation and R&D (Prajogo and Sohal, 2001; Singh and Smith, 2004) employee performance (Fuentes-Fuentes *et al*., 2004); and customer satisfaction (Ittner and Larcker, 1998) and financial performance (Demirbag *et al*., 2006).

According to Ittner and Larcker (1998), non financial indicators of improvements in areas such as quality, customer or employee satisfaction, and innovation may be better predictors of future financial performance than historical accounting measures, and should supplement financial measures in internal accounting systems (e.g., Deloitte Touche Tohmatsu International, 1994 and Kaplan and Norton, 1996). This same discussion has produced calls for disclosure of non financial information on the drivers of firm value (e.g., Wallman, 1995; Edvinsson and Malone, 1997, and Stewart, 1997). A report by the *American Institute of Certified Public Accountants* (1994), for instance, concludes that companies should disclose leading, non financial measures on key business processes such as product quality, cycle time, innovation, and employee satisfaction (Ittner and Larcker, 1998). Based on these reasons, the researcher finds that company non financial measures are leading indicators of company financial performance (Hendricks and Singhal, 2003; Dehning *et al*., 2004; Skrinjar, *et al.*, 2008).

2.5.4 Mediating Effect of Company Non Financial Performance

Earlier studies of TQM implementation and financial performance treated TQM elements as independent variables and tried to establish a relationship between them. In the case of small and medium enterprises (SMEs), non-financial performance dimensions are equally significant and may mediate between TQM practices and financial performance (York and Miree, 2004; Rahman and Bullock, 2005) consequently indicating effectiveness of TQM implementation (Prajogo and Sohal, 2006). Hackman and Wageman (1995) point out long-

term versus short-term performance issues in TQM implementing organizations. This argument also can be extended to cover TQM implementation in SMEs, where there may be time lag between TQM implementation and financial performance (Demirbag *et al.,* 2006).

2.6 TQM and Contextual Factors of An Organization as Mediating Variables

TQM approach has tended to focus on internal processes rather than on external issues such as competitiveness and market appeal, and become more reactive and adaptive than anticipative. The time has come to go beyond TQM and to understand the nature and application of contextual factors of an organization (learning organization and world-class organization), which may affect TQM implementation (Luthans *et al*., 1995; Sadikoglu, 2004). Learning organization envision change is committed to generating and transferring new knowledge and innovation, and has learned how to learn. TQM may be embedded in the learning organization, but it is a first step or wave in transforming and creating organizations which continuously expand their abilities to change and shape their futures—incremental/continuous improvements (adaptive organization). TQM (continuous improvement) requires a commitment to learning (Garvin, 1993). Garvin has recognized a link between learning and continuous improvement and has begun to refocus the companies strategic around it.

Garvin (1993) defined a learning organization as follows:

> "A learning organization is an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights." (Garvin, 1993: p. 80)

Hill (1996) also argued that organizations wishing to progress towards TQM must address the implementation of organizational learning. This is necessary for a number of reasons. *First*, such a transition usually entails major organizational change encompassing, among other things, culture, structure, and behaviors. Change and learning go hand in hand (Bounds *et al.*, 1994). Indeed, a change has been conceptualized as a learning journey (Burdett, 1994). *Second,* it has been argued that organizational learning and TQM are inextricably linked, and that organizational learning should be the most compelling reason for undertaking a TQM effort (Barrow, 1993). Moreover, organizational learning has been described as the "passport to continuous improvement", which involves a learning of new ways of doing existing things and, at its best, learning new things to do. As Garvin (1993) states:

> "Continuous improvement requires a commitment to learning. How after all can an organization improve without first learning something new." (Garvin, 1993, p. 78)

Third, and perhaps most compelling, is the growing recognition that the rate and effectiveness of organizational learning may soon become the only source of sustainable competitive advantage, especially in certain industries (Stata, 1989 cited in Hill, 1996).

What are organizations doing to develop and sustain a competitive edge (to gain sustainable competitive advantage? They employ a number of strategies that can be best summarized in term of three stages or paradigm shifts through which organizations must progress to compete in today's global economy environment. McGill *et al.* (1992) recognized adaptive organizations, which are characterized by reaction to required changes (stimulus-response behavior) but a failure to anticipate and stay on or ahead of the cutting edge (Hodgetts and Luthans, 2000). In addition, learning organizations, as an integral part of new paradigm organizations, is able to transform themselves by anticipating change and discovery of new

ways in creating products and services; they have learned how to learn. Figure 2.7 illustrates the new paradigm organizations: from total quality—adaptive organizations to anticipative learning organization to being simply the best and world-class organizations (WCOs). An attention has been given to TQO so far, and the rest of the next section is devoted to the emerging learning and world-class organizations in the oil and gas industry.

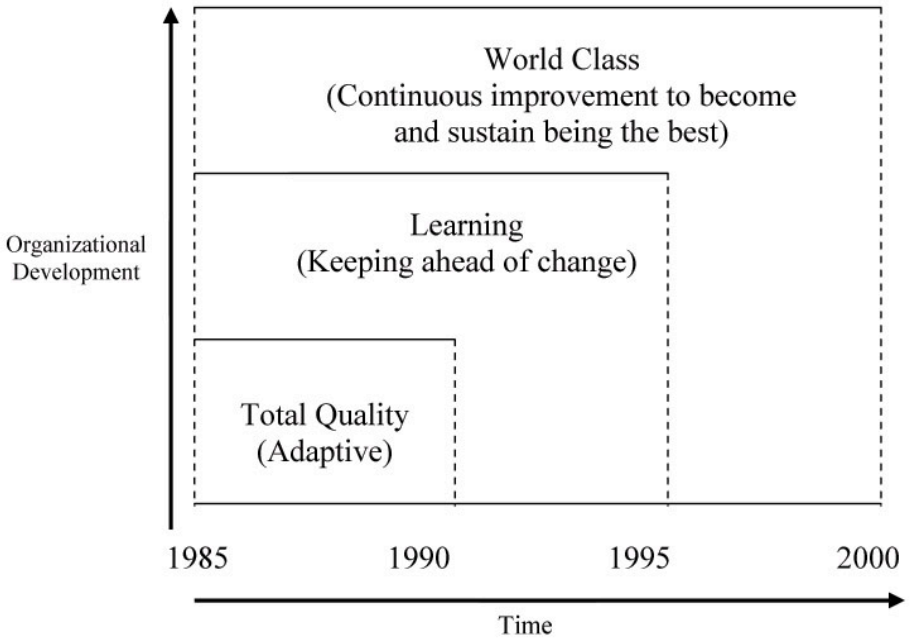

Figure 2.7
New Paradigm Organizations
Source: Hodgetts and Luthans (2000); Hodgetts *et al*. (1994).

2.6.1 Learning Organization

Easterby-Smith and Lyles (2003) view "learning organization" as entities, which have the capacity to learn effectively and properly. The concept itself emerged towards the end of the 1980s largely on the basis of the work of British Authors Garrat and Pedler. However, de Geus's paper published in *Harvard Business Review* brought a wider attention to the concept and Senge's 1990 book become the foundational work and the key source for academics as well as an inspiration for the practitioners. Senge (1990) defines a learning

organization as a place where people continually expand their capacity of creating results they really want, where patterns of thinking are broadened and nurtured, where collective aspiration is free and where people are continually learning to learn.

Using the social construction perspective, DeFillippi and Ornstein (2003) explained that organizational learning takes place socially. Learning is embedded in the relationships and interactions among people. Learning is thus social and is grounded in the concrete situations in which people participate with others. Elkjaer (2003) similarly added that learning is not restricted to taking place inside individuals' minds but as a process of participation and interaction. In other words, learning takes place among and through other people. Learning is also viewed as a relational activity, not an individual process of thought. This view changes the locus of the learning process from that of the mind of the individual to the participation patterns of individual members of organizations in which learning takes place. In this sense, learning is regarded as a ubiquitous part of human activity. It is an integral part of the practice in everyday organizational life and work. Given this, Elkjaer implies a "situated curriculum, which denotes the pattern of learning opportunities available to newcomers in their encounters with a specific community inside a specific organization. Learning is something enabling actors to modify their relations to others while contributing to the shared activity" (Genilo, 2007: p. 19).

To deal with the environmental complexity, an organic system must develop processes for searching learning as well as deciding (Spencer, 1996 cited in Wang, 2004). The most successful corporation of the 1990s will be something called a *learning organization*. Over the long run, superior performance depends on superior learning (Senge, 1990). TQM includes the idea of learning organization. Hackman and Wageman notice TQM's learning

orientation stating "TQM is pro-learning with a vengeance" (Hackman and Wageman, 1995). In a TQM implementation, managers and supervisors "grow" with change and work with their troop. They ask their employees what the next thing we need to do. They educate their employees so that the knowledge could be accumulated in the organization (Wang, 2004). Garvin (1993) points out that many TQM concepts actually are the concept of learning organization. These concepts include: *Kaizen*, Experimental Design, and Benchmarking.

Through the incorporation of new ideas about learning, training and process innovation, the quality movement is able to demonstrate the potential capability of the organizations to cope with the uncertain and changeable circumstances of today's environments (Sitkin *et al*., 1994). With regard to the question: "how can an organization learn?" Hackman and Wageman (1995) cited in Montes *et al.* (2003: p. 196) and cited in Wang (2004: p. 399) state that there are three different types of learning in TQM:

(1) Learning among employees by means of cross-functional teams and problem solving;

(2) Learning about ways to enhance (to improve) performance and work processes; and

(3) Learning about the management of collective objectives and interests—what the collectivity should be doing.

The teamwork and problem solving techniques are the first two types of learning called as first order learning or single loop learning (Sitkin *et al*., 1994; Hackman and Wageman, 1995; Fulmer *et al*., 1998). Unfortunately, TQM does not specifically focus on the third type of learning: double-loop or second order learning (Wang, 2004). It is not to say that TQM firm can not have double-loop learning. The responsibility of double-loop learning

lies on the shoulder of managers (top management commitment and supervisory leadership). TQM managers should provide a leadership (Evans and Lindsay, 1996). Senior managers and supervisors, as leaders, should learn about the collective purposes and provide a vision to their employees.

Overall, TQM is a learning orientation (Hackman and Wageman, 1995 cited in Wang, 2004). Although TQM does not explicitly provide any direction for second (double-loop) learning, it really does adopt most learning principles. Sitkin *et al.* (1994) called TQM's second order learning as TQL (*Total Quality Learning*). However, TQL is not prescriptive as other TQM practices.

According to Montes *et al*., (2003) the quality movement proponents state that the staffs within a company are willing to learn and develop themselves. However, this trend can weaken, since learning may not be shared, common value in the company, or a lack of the necessary tools and skills may exist. TQM practices generate the ideal environments for learning, minimizing the organizational culture fears and providing employees with a series of tools enabling them to develop. Furthermore, with different levels of continuity, TQM informs employees about the performance level of their work processes.

According to Barrow (1993), TQM and the organizational learning are intrinsically bounded; the later brings the main reason to carry out the endeavors involved by the former. In this case, the relationship between them can be studied on a twofold basis:

(1) TQM itself constitutes a learning process; and

(2) TQM affects the way in which organizations learn.

On the other hand, TQM constitutes an organizational learning process that involves an introduction of changes in the way of organizations act. In this regard, TQM has been considered both as a double-loop learning process (Grant *et al.*, 1994), and as a single-loop learning process (Hackman and Wageman, 1995). In fact, according to the former consideration, the changes brought about by TQM result from a learning process incompatible with the traditional management practices, in such a way that a change in the premises upon which these practices have been built is necessary for the success of the TQM practices. On the contrary, those standing for the TQM as a single-loop learning consider that in TQM, the rhetoric predominates (Zbaracki, 1998), so that the main change in organizations is related to the way where managing processes are recognized, whereas the basic premises remain the same (Montes *et al*., 2003).

TQM meanwhile affects the staff's knowledge-acquisition processes, as it is considered that their power comes from their competence to develop new starting points to solve existing problems in the organizations (Mukherjee *et al.*, 1998). Thus, one of the basic principles of TQM is the continuous process improvement embedded in an explicit attempt to learn out of one's own experience (Miner and Mezias, 1996). In this way, organizations focus on the study of the errors made and find out solutions. Therefore, they put into practice one of the knowledge-acquisition ways that most decisively contributes to boost the company performance in a short-term, as there is an evidence that people learn more from their mistakes than from their right decisions (Li and Rajagopalan, 1997).

TQM is a systematic, integrated (holistic), and organizational way-of-life directed at a continuous process improvement where aspirations must be supported by the system through the removal of barriers, and also favoring a learning-driven environment, which

includes substantial investments in training and the spreading of the statistics and cross-personal techniques designed to promote learning, both at the individual and at the team levels. In any case, the individual's higher or lower level of learning will not be subjected to the support of the system. Rather, it will depend on the personal characteristics of individual given—capability and skill (Montes *et al*., 2003).

Some would argue, especially those associated with TQM, that there is no clear distinction between total qualities and learning organizations. However, in terms of emphasis, perspective, and even certain specific design characteristics, most academicians and impartial observers would say that a difference exists. For example, an organization can achieve a marked improvement in quality by practicing "*single-loop*" learning. Faced with the quality challenge in the global marketplace, these organizations find the ways of meeting the challenge successfully. Learning organizations, on the other hand, are characterized by anticipating change (Hodgetts *et al*., 1994).

Based on the definition of learning organizations, the overriding characteristic in a learning organization is the intense desire to learn. Another closely related characteristic is a strong commitment to generating and transferring new knowledge and technology. It is facilitated by information gathering and training programs (offered by both internal and external sources). In addition another key characteristic is openness to the external environment. The learning organization is responsive to, and is trying to learn about what is going on in the outside world. It then relies heavily on periodicals, research reports, briefings from key personnel, and talks and seminars by outside experts.

Moreover, the members of learning organizations have developed some values that emphasize on a shared vision and systems thinking. A shared vision obviously creates a personnel commitment. Once everyone knows and understands where the organization is heading, it will ease to gain support for the activities that must be performed. This is ongoing and demands ongoing effort. System thinking focuses attention on the interrelationships between cause and effect, it thus avoids short-term solutions not addressing long-term (systemic) problems. Participants are trained to identify symptoms, and solve underlying problems. A good example – related to this – is provided by oil and gas industry. Each department in oil and gas companies has an ideal team in which all employees participate in the operational excellence practices. These teams meet on a formal basis and engage in the following five-step problem solving process in developing operational excellence practices: (1) the group brainstorms regarding causes of the problem under review, (2) The most important causes of the problem are identified, (3) An action plan is developed for resolving the problem, (4) A cost/benefit analysis is conducted and (5) the proposed solution is implemented and then reviewed.

The period of 2005-2020 is the important transition years for entering the era of competing in the global marketplace, following efforts of managing with the triple-A strategy—*Agility, Adaptability, Alignment* (Lee, 2004) in facing up to a sustainable competitive advantage. Triple-A strategy is an important requirement for companies to stay ahead of competitors and survive in the global competitive market place. ***Agility*** has been defined in the literature as an ability to thrive and prosper in a competitive environment and to quickly respond to rapidly changing markets and customer/society needs (Fliedner and Vokurka, 1997; Lee, 2004). Fliedner and Vokurka (1997) identified four key dimensions of agile competition: enriching the customer or the society; cooperating to enhance the

organization/nation competitiveness; organizing the master change and uncertainty through quality and innovation; and leveraging the impact of people, information, and technology. These dimensions recognize the importance of employees/citizens as a company/nation asset and therefore place greater emphasis on the development of this asset through education, training and empowerment. ***Adaptability*** is an ability to adapt over time as market structures and change strategies evolve. ***Alignment*** is an ability to align the interests of all firms (nations) in the supply-demand network (Lee, 2004). "Triple-A merges the four distinctive competencies of flexibility, dependability, quality, and cost" (Fliedner and Vokurka, 1997: p. 2; Lee, 2004: p. 105).

Good managers are able to create a value (sustainable value creation) throughout the value chain of the company—upstream (supply-chains), midstream or mainstream chains (value-added processes), and downstream chains (demand-chains) (Kinicki and Wiiliams, 2006). The reason is that a manager has a multiplier effect whose influence in the organization is multiplied far beyond the results that can be achieved by an individual action. Lee (2004) states that the best value chains are not only fast and cost-effective but also are agile and adaptable by ensuring all their companies' interests stay aligned. The implementation of Triple-A strategy at this point requires an interaction among quality improvement, learning organization, and world-class organization (Lee, 2004; Rossetto and Franceschini, 1995; Rice and Mahmoud, 2001).

Company managers in addition are able to significantly advance the cause of Triple-A strategy execution by pushing organization units and company personnel to identify and adopt (learn from) the best practices for performing value-chain activities and, further, insisting on continuous process improvement in how internal operations are conducted. One of the most widely used and effective tools for learning and gauging how well the

executing pieces of its strategy entail the benchmarking of the company's performance of particular activities and business processes against best-in-industry and best-in-world performers or best practice (Ungan, 2004; Hyland and Beckett, 2002). It will also bring a great benefit to look at best-in-company performers of an activity if a company has a number of different organizational units performing the same function at different locations. Identifying, analyzing, and understanding (learning by doing) how top companies perform particular value-chain activities and business processes will provide the useful yardsticks for judging the effectiveness and efficiency of internal operations and setting performance standards for organization units to meet or beat (Thompson *et al*., 2007). The next subsections describe the implementation of learning organization into best practices and operational excellence practices.

2.6.1.1 Best Practices

The best practice is a technique in performing an activity or business process that, at least, one company has demonstrated works particularly well. To qualify as a legitimate best practice, the technique must have a proven record in significantly lowering costs, improving quality or performance, shortening time requirements, enhancing safety, or delivering some other highly positive operating outcomes. The best practices thus identify a path to operating excellence. To make the best practice valuable and transferable, it must demonstrate success over time, deliver quantifiable and highly positive results, and be repeatable. Benchmarking is the backbone of the process in identifying, learning, and implementing outstanding practices (Thompson *et al*., 2007). Thompson *et al.* stated that the more organizational units use best practices in performing their work, the closer a company moves toward performing its value-chain activities as effective and efficient as possible. This is what operational excellence is all about. Benchmarking and best practice

implementations have clearly emerged as legitimate and valuable managerial tools in promoting operational excellence.

Previous researchers in the area of the causal (structural) relations between TQM practices and organizational performance have not considered the impact of WCC (best-in-world performers) and OE on company performance. In several interviews with the oil and gas managers, the researcher found WCC and OE to factors definetely affecting company performance. Consequently, in this empirical study, the researcher introduces the WCC and OE as mediating (intervening) variables to determine the impact of critical factors of QMPs on the CFP.

2.6.1.2 Operational Excellence Practice (OE)

In pursuing the global competitive advantage, it is increasingly important to execute the organization vision and mission by consistently focusing on operational excellence (Allen and Kutnick, 2002; U.S. NAVAIR, 2002). Operational excellence reflects the organization's adoption and adaptation (the implementation of learning organization) and regular process for assuring the essential global management system standards by implementing all aspects of organizational development (Mandell, 1999). Implementing operational excellence may require TQM practices (Parker, 1999). According to Parker, operational excellence is superior to TQM now that it changes work processes fundamentally. Operational excellence is a management philosophy demanding an introspective action, and a focus on continuous process improvement and innovation. Thompson *et al*. (2007) define TQM as a managerial tool that can contribute to operating excellence and better strategy execution. Here, it can deliver good results when used properly.

Parker (1999) defines operational excellence as a systematic management of *safety, environment, health, reliability, and efficiency* (SEHRE) to achieve world-class organization. The following performance expectations have been established as parts of operational excellence practices:

1. An injury-free work place achievement **(Safety**)
2. Elimination of spills and environmental incidents and identification and mitigation of key environmental risks (**Environmental**)
3. Healthy work place promotion and significant health risk mitigation (**Health**)
4. Incident-free operation with industry leading asset availability (**Reliability**)
5. Maximization of resources/asset utilization (**Efficiency**) (Loflin and Kipp, 1997; Schneider Electric, 2003; www.polyurethane.org/pdfs/ExSecurity.ppt, 2002).

The operational excellence practices specify the structure and expectation of operational excellence that are enterprise-wide requirements including:

a. A process referring to a set of interrelated and interacting activities.
b. A desired result achieved more efficiently when related activities and resources are managed as a process.
c. A management system as a set of processes.
d. Systematic management referring to identifying, understanding and managing interrelated processes as a system.
e. Identifying, understanding and managing interrelated processes as a system contributing to an organization's effectiveness and efficiency in achieving world-class performance in operations (Allen and Kutnick, 2002; Parker, 1999; Peters and Waterman, 1984).

King and Lenox (2001) and Liker (2004) described the operational excellence practices with four dimensions: philosophy, process, people and partners and problem solving. Allen and Kutnick (2002) meanwhile recognize the four perspectives of operational excellence practices as goal, platform automation, process performance and organizational impact.

The Polyurethane (www.polyurethane.org/pdfs/ExSecurity.ppt, 2002) at this point conceptualizes operational excellence practices based on five dimensions: management policy and leadership, need of identifications and planning, accountability and implementation, measurement and corrective action, and management system for security. According to Schneider Electric (2003), the operational excellence practices are described into five perspectives: efficiency, globalization, organization, internationalization and localization, and process.

According to Fisk (2006), a discipline value provides a simplistic but useful thinking model, and argues that there are three disciplines that can lead any company to be a leader (world-class organization) in any sector:

a) Product leadership—these companies have an obsessive focus on innovation and quality in order to offer the best product.
b) Customer intimacy—these companies have an obsessive focus on service and relationship in order to offer the best solutions.
c) Operational excellence—these companies have an obsessive focus on efficiency and consistency in order to offer the best price.

Figure 2.8 shows three value disciplines developed by Michael Tracy and Fred Wiersema (Fisk, 2006) to understand an orientation, which a business must embrace to achieve world-class organization.

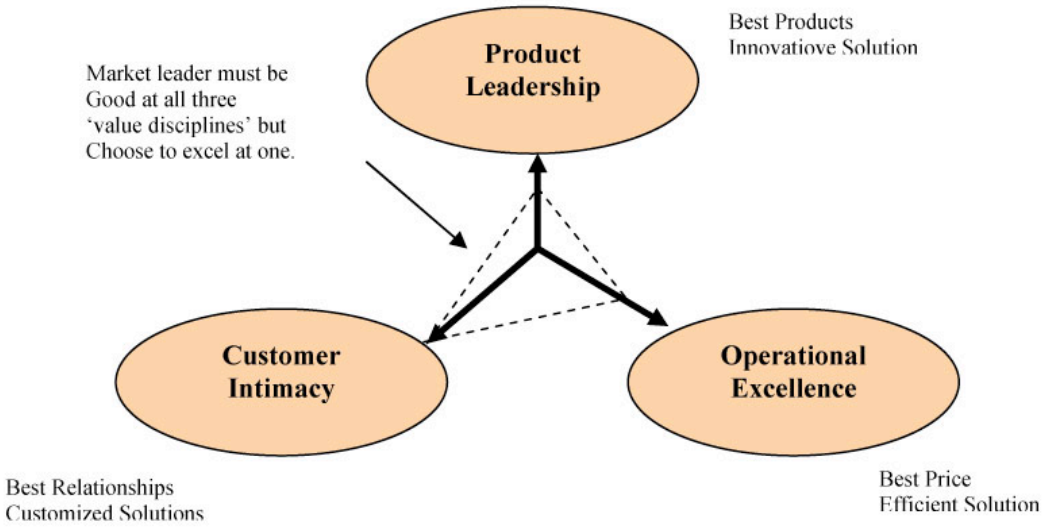

Figure 2.8
Value Discipline
Source: Fisk (2006)

The operational excellence practices in oil and gas industry originally evolve from Chevron-Texaco's program. It defines the key function areas, or aspects, of safety, environment, health, reliability, and efficiency as critical in meeting the company's policy commitment and strategic goals (ChevronTexaco, 2003). The operational excellence practices are the integral parts of the strategic business intents to achieve the "4+1" performance (organizational capability, operational excellence practices, cost reduction, capital stewardship, profitable growth). Organizational capability systems link six elements: dynamic leaders, skilled employees, learning and innovation, recognition and accountability, world-class processes and organization, technology and partnership. In the holistic efforts, operational excellence practices, cost reduction, capital stewardship and profitable growth for distinct capabilities system will be built. To help the businesses deliver world-class performance, protecting people in the environment has been established for operating practices in the following critical element areas: leadership, safety and incident free operations, legislative and regulatory advocacy, compliance assurance, natural

resource conservation, product stewardship, pollution prevention, property transfer, community outreach, and emergency management (Chevron Indonesia, 2007).

This study applies the concept of operational excellence practices which has been already implemented by ChevronTexaco, one of the biggest Oil and Gas Company in the world. The following subsection describes world-class organization as a contextual factor of oil and gas companies, beyond the learning organization.

2.6.2 World-Class Organizations

Some companies have managed to go beyond the learning organization stage (adopting best practices and striving for continuous process improvement): to become world-class organizations (best-in-world performers). These enterprises are not merely leaders in their field; they are recognized as the best—and they strive to sustain this status. "A world-class organization can be described as being the best in its class or better than its competitors around the world, at least in several strategically important areas" (Hodgetts *et al*., 1994: p. 14). Thus, any organization, regardless of size or type, can be world-class. Many organizations are exceptional in none or more areas of performance.

World-class organizations consist of both total quality and learning organizational characteristics. To be a world-class organization, an organization must excel in most of the dimensions that are important in both total quality and learning organizations; nevertheless there are other dimensions as well. Figure 2.9 summarizes six pillars that seem necessary to support world-class organizations—customer-based focus, continuous improvement, fluid-flexible or virtual organizations, creative human resource management, egalitarian climate, and technological support.

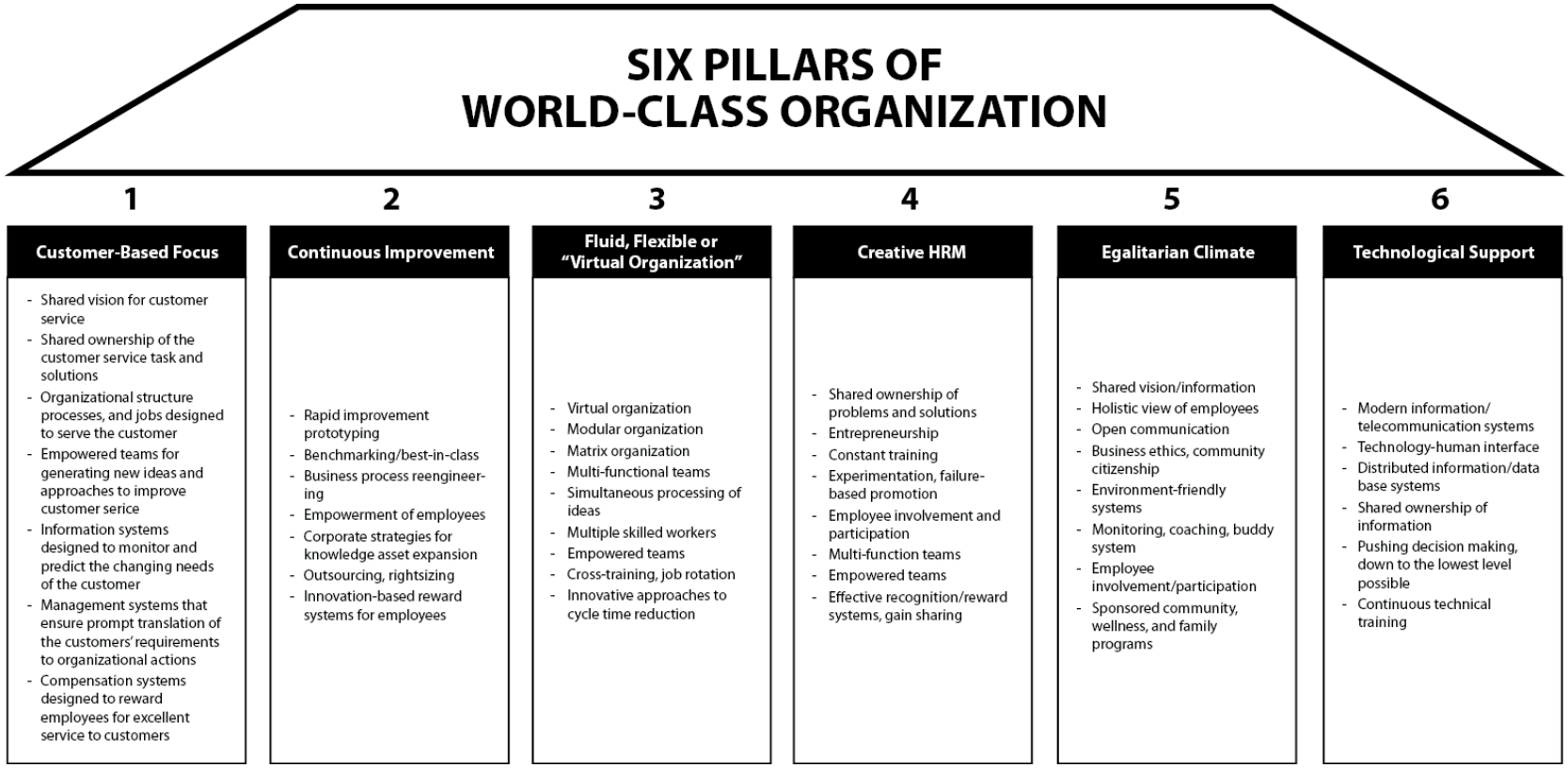

Figure 2.9
Six Pillars of World-Class Organization
Source: Hodgetts and Luthans (2000) and Hogdetts *et. al* (1994)

2.6.2.1 World-Class Company Practice (WCC)

Researchers like Gitlow *et al*. (2005), Madu and Kuei (1993) cited in Ahire *et al*. (1995) state that TQM is still recognized only recently by companies as a powerful competitive strategy in order to achieve WCO successfully. The goal of world-class organization is eliminating all wastes and the developing customer satisfaction (Rubrich and Watson, 2000). World-class organization means a company that produces goods and services in an effective and efficient way at international level. According to Rubrich and Watson (2000), world-class organization is essential by developing an effective company's strategy to compete in global market environment.

Basu and Wright (1996) stated that in entering the global market environment, organizations must compete against world-class orientation. It only follows that organizations' ability to compete, and survive, will depend on its ability to create a consistent standard of excellence which transcends global boundaries or to achieve world-class organization (Thorne and Machrey, 2000). To meet this need, a manufacture should develop an internal benchmarking approach that enables a company to self-appraise against establishment of world-class manufacturing standards. It is called world-class company practices solution (Hayes and Pisano, 1994).

Flynn *et al*. (1997) meanwhile defines WCC as a systematic process of measuring all aspects of a manufacturing business through six pillars of WCC solution (marketing and innovation, supply chain management, environment and safety, manufacturing facilities, procedures, and people).

The term "world-class company" was first used by Hayes and Wheelwright (1979) to describe an organization (i.e. manufacturing) achieving a global competitive advantage through the use of their company (manufacturing) capabilities as a strategic weapon (Hayes and Wheelwright, 1984). The concept of world-class company has been embraced, expanded and enhanced by a number of authors (Flynn *et al*., 1999; Schonberger, 1986), who have reinforced some of Hayes and Wheelwright's ideas, added some new practices and ignored others.

Hayes and Wheelwright (1984) additionally developed their concept of world-class company based on an in-depth analysis of the practices implemented by Japanese and German manufacturing companies, as well as U.S. manufacturing companies which had competed equally with the Japanese and German manufacturing companies. The term "world-class company" was used because these manufacturing companies were associated with an outstanding performance in their global industries, resulting in them being described as "world-class". Hayes and Pisano (1994) found that there were many commonalities between these highly successful firms, arguing that the key to building competitive strength is related to six world-class manufacturing practices (Flynn *et al*., 1999; Leong *et al.,* 1990).

Hayes and Pisano (1994) find that relative to manufacturing companies in Germany and Japan, U.S. manufacturing companies had neglected *workforce skills and capabilities*. They, in this case, recommended a proactive stance on the part of U.S. manufactures, focusing on apprenticeships, internal training institutes and cooperative arrangements with vocational technical institutes. They also find *management technical competence* lacking, relative to Japan and Germany, making management of cutting edge manufacturing a

significant challenge. To provide technical training for managers, they furthermore suggest to involve more managers with engineering or technical degrees, and to rotate managers through technical functions in their organizations (Flynn *et al*., 1999).

Flynn *et al.* (1999) also states that although Hayes and Wheelwright (1984) view the third practice as *competing through quality*, their definition is substantially narrower than recent definitions of quality management focusing primarily on the product design function, with customers as the drivers of quality. In terms of *workforce participation*, Hayes and Wheelwright emphasize that development of true worker participation moves beyond simply putting employees into teams but also by focusing on culture change and policies which support the employees' participation.

Hayes and Wheelwright's fifth practice, *rebuilding manufacturing engineering*, describes an internal development of equipment with unique characteristics, which is difficult for competitors to copy. They also stress the importance of developing employees' ability to maintain and improve their own equipment. At last, Hayes and Wheelwright speak of 'Tortoise and Hare' approaches to the competition or *incremental improvement approaches*. While U.S. manufacturing companies have traditionally pursued strategic leaps as a means of manufacturing improvement, Hayes and Wheelwright suggest that world-class competitors should pursue a continuous improvement in small increments winning the race by creating a constantly escalating standard (Flynn *et al*., 1999).

More recent authors (Giffi *et al*., 1990; Schonberger, 1986) have developed their own descriptions of WCC, often building on new manufacturing company's practices, such as TQM and JIT. Schonberger (1990) provides a list of sixteen principles of world-class

manufacturing. Many of these correspond to Hayes and Wheelwright's practices, although they directly are not necessary. In addition, Flynn *et al*. (1999) consider the work of Giffi *et al.*, (1990), which summarizes the attributes of world-class organizations or world-class companies.

From the above comparison of recent descriptions of world-class companies with Hayes and Wheelwright's world-class manufacturing practices, Flynn *et al*. (1999) state that Hayes and Wheelwright's foundation for world-class company is more relevant for today's organizational environment. Flynn *et al.* also seek to identify all world-class company practices functioned in the achievement of operating performance, examining whether they support dimensions of operating performance which are tradeoffs or synergies—world-class performance in operations.

The concept of world-class company practices is based on the early work in the area in implementing the construct of world-class company suggested by Hayes and Wheelwright. Hayes and Wheelwright's practices are then related to the competitive performance, and the addition of new company practices resulted in further continuous improvement practices in a competitive operating performance. The Hayes and Wheelwright's concept is important to this study in that the concept of world-class company is associated with OE in the global industries (world-class performance in operations), resulting in the industry being described as WCC (Flynn *et al*., 1999; Voss, 1995). The next section, the researcher describes the summary of the literature review of the study.

2.7 Summary of The Literature Review

The literature is reviewed in order to ascertain the relevant research on the following issues; QMPs, the contextual factors of WCC and OE (world-class performance in operations), CNFP, and CFP. The literature review is employed to enunciate the research method and describes the selected literature of the study based on the relative importance attached to five constructs supporting the comprehensive (sequential) of sustainability TQM implementation model in the oil and gas industry.

In the next chapter (Chapter III), the researcher describes and explains the research methodology employed in this study. As an explanatory study (a quantitative-deductive research approach), this study is based on a questionnaire mail survey, e-mail survey and interview to the top level, middle level and low level managers at the SBU level in the oil and gas companies. Overview of research paradigm, the research design and method, the research flow, the research questions, hypotheses development and research framework, research instrumentation, sampling method, data collection method and pilot test, and data analyses method used are also reviewed and discussed.