

The effects of Total Quality Management on Organizational Performance in the South African Police Service's Forensic Science Laboratory

by

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*Thesis presented in partial fulfilment of the requirements for the degree
Masters in Public Administration in the faculty of Management Science
at Stellenbosch University*



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April 2019

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Abstract

The purpose of this study was to determine the effect of Total Quality Management (TQM) elements of Leadership, Employee Involvement and Customer Focus on Organisational Performance within the South African Police Service, Forensic Science Laboratory. A thorough analysis of TQM was provided for a better understanding of the concept. The elected elements of TQM for this study were described in detailed and broken down into dimensions. These dimensions were used as indicators in the questionnaires to measure their effects and contributions to organisational performance.

The questionnaire was divided into different sections that covered all the TQM elements elected for this study. This was administered to a purposive sample of Forensic Analysts of the Forensic Science Laboratory at Silverton and General Piet Joubert Buildings. The dimensions for each of the study variables were converted into statements to which respondents provided their perception on a seven point Likert scale.

The results and findings of the study provided valuable information to management and employees of Forensic Science Laboratory to identify areas of improvement. Furthermore the study aimed to promote TQM principles at the Forensic Science Laboratory. Employees not being involved in setting up performance goals or in decision making were identified as the main contributors to non-performance. On the positive side, resource allocation, training and competency of members and the FSL understanding of customer needs were identified as performance enhancers.

Opsomming

Die doel van hierdie studie was om te bepaal wat uitwerking van Totale Gehalte Bestuur (TGB) elemente van leierskap, werknemer betrokkenheid en kliënt fokus op organisatoriese prestasie binne die Suid-Afrikaanse Polisie diens, Forensiese Wetenskap Laboratorium (FWL). 'n Deeglike analise van TGB vir 'n beter begrip van die konsep is verskaf. Die verkose TGB elemente vir hierdie studie was gedetailleerd afgebreek in verskeie dimensies beskryf. Hierdie dimensies is gebruik as aanwysers en die vraelys om die effek en bydraes to die organisatoriese prestasie te bepaal.

Die vraelys is verdeel in verskeie afdelings wat al die verkose TGB elemente vir hierdie studie dek. Dit was aan 'n doelbewuste monster van die Forensiese ontleders van die Forensiese Wetenskap Laboratorium by Silverton en Generaal Piet Joubert geboue toegebied. Die dimensies vir elk van die studie veranderlikes was omskep in stellings waaraan respondente hul persepsie op 'n sewe punt Likert skaal verskaf het.

Die resultate van die studie verskaf waardevolle inligting aan die bestuur en werknemers van die Forensiese Wetenskap Laboratorium om areas van verbetering te identifiseer. Die studie was verder daarop gemik om TGB beginsels by die Forensiese Wetenskap Laboratorium te bevorder. . Werknemers wat nie is in die opstelling van prestasie doelwitte of in besluitneming betrokke is nie, is geïdentifiseer as die belangrikste bydraers tot nie-prestasie. Aan die positiewe kant is hulpbron toekenning, opleiding en bevoegdheid van lede, en die FWL begrip van kliënte se behoeftes geïdentifiseer as prestasie versterkers.

CHAPTER 1: Context and rationale for the study

1.1 Introduction

This chapter consists of the background to the study including the problem statement followed by the rationale of the study, research aim and objectives. It includes in addition, the research hypothesis, research design and methodology, scope of the study, study population and sample, and concludes with the structure and outline of the study.

1.2 Background of the study

TQM has evolved over time, initially as a tool to improve product quality but is now utilised for many applications (Dean & Bowen, 1994:394). The emergence of total quality management (TQM) has since then been one of the major developments in management practice (Prajogo and Sohal, 2002:901).

Can TQM as a management practice indeed be utilised to enhance organisational performance? Numerous scholars and researchers (Prajogo & Sohal, 2002; Rahman & Bullock, 2004; Kaynak, 2003; Zakuan, Yusof, & Shaharoun, 2009; Aktar, Zameer and Saeed, 2014; Mohammadi, 2014 & Sabella, Kashou & Omran, 2014) have conducted studies to establish the relationship between TQM practice and organisational performance. The general conclusions of the abovementioned studies and many others is that Total Quality Management and organisational performance have a significant positive relationship.

For example, Prajogo and Sohal (2002), through a study they conducted, demonstrated that a positive and strong relationship exists between TQM and organisational performance. The positive benefits of TQM have therefore persuaded many companies and public sector organisations to implement TQM. This has motivated many academics and scholars to further investigate the relationships between total quality management initiatives and organisational performance (Tari, Molina-Azorin, Pereira-Moliner, Lopez-Gamero & Pertusa-Ortega, 2015:1). Many of these studies have also found a positive and significant relationship between TQM and Organisational Performance (Inderlal (2013); Masejane (2012); Salahedin, (2009), Mehmood, Qadeer & Ahmad (2014)).

With many studies confirming, TQM as having a positive and significant effect on organisational performance, there are however some studies that have highlighted a failure of TQM implementation in delivering the desired performance goals. In some instances, it was found that there is no relationship, or that the impact was insignificant (Nair, 2005:949). Other studies have shown only partial support for TQM by stating that not all elements of TQM have an effect on performance. Many of the studies reviewed indicated the specific elements that have an effect on organisation. Rahman & Bullock (2004:73) stated that TQM human factor elements, such as team work, employee contribution, skills and training; leadership; and customer interactions have an effect on organisational performance. Inderlal (2013); Jørgensen & Nielsen (2013) and many other used the similar TQM elements used by Rahman and Bullock (2004).

This study focused on leadership, customer focus and employee involvement, the three widely used TQM elements as determined by a review of literature on TQM and Organisational Performance,. These three elements were investigated to determine their effects on the quality of forensic products and services and whether the performance of the FSL was influenced.

The attainment of Organisational Performance (OP) is critical for the survival and success of any organisation, and the FSL is no exception. Non-achievement of performance objectives, the pressure of courts, parliament and negative media reports has led government to allocate additional funds to the FSL to enable it to deliver on its mandate.

The FSL plays an important role in the criminal justice system of the country. The investigative process is not complete without the forensic evidence provided by the laboratory, because this type of evidence is much more reliable than any other form of evidence in criminal proceedings. Reliability, usability and timeously delivered evidence are the key ingredients to performance objectives of FSL. The turn-around times to process and finalise evidence are indicators of organisational performance. The usability, reliability and credibility of the service and the products and outcomes of processing are indicators of quality improvement.

Organisational performance was the ultimate dependent variable of interest for this study, with quality improvement as an intermediate dependent variable. The chosen three elements of TQM, which are leadership, customer focus and employee

involvement were the independent variables for this study. The choice of these three out of many TQM aspects was motivated by numerous studies that indicated that a positive relationship that exists between these elements of TQM and Organisational Performance (Ross, 1993:1; McKone, Schroeder & Cua, 2001:40; Kaynak, 2003:406; Samson & Terziovski, 1999:393).

1.3 Problem statement

How do Organisations improve their performance? Is there a universal management practice that enables organisations to improve their performance? Is there a universal response to these questions? The answer to this question could not be found by the researcher and many other researchers and academics (Eriksson, 2002:1). It is mentioned in many studies, such as Eriksson (2002); Idris and Zairi (2007); Masejane (2012); Dean and Bowen (1994) and many others that there is no agreement on a single management practice that will ensure organisational performance. This question remains not fully answered by the past literature, with academics and practitioners still holding different views (Idris & Zairi, 2007:1).

Idris and Zairi (2007:1) state in their study, for example, that although many studies support TQM as a universal business strategy, the effective implementation is key to TQM contribution to organisational performance. Meaning that, depending on how the management system was implemented, the TQM principle must assist one organisation to achieve the desired results but not the other. They also mention that the ever changing business environments pose challenges to TQM organisations.

While there have been many studies on TQM and its impact/effect on organisational performance (Jaafreh & Al-abadallat, 2013; Rahman & Bullock, 2004; Ngambi & Nkemkifiafu, 2015; Nekoueizadeh & Esmaeilli, 2013; Munizu, 2013; Lakhal, Pasin & Limam, 2006; Mahmood, Qadeer, & Ahmad 2014; Mann & Kehoe, 1993; Abuzaid, 2015; Prajogo & Sohal 2006; Prajogo & Cooper, 2017; Samson & Terziovski, 1998; Yue, Ooi, and Keong, 2010; Mahmood, Qadeer & Ahman, 2015; Mohammadi, 2014), there is a paucity of similar studies in South Africa. Only two local studies were found by Masejane (2012) and Inderlal, (2013) which examined the impact of TQM on organisational performance. No studies were found that focus specifically on this relationship of TQM and Organisational Performance in the field of forensic science.

It can then be concluded that very little if any is known about the effects of TQM on quality performance and organisational performance in the field of forensic science, hence this study attempted to bridge the gap.

1.4 Definitions

Customer Focus: In this study customer focus exists when an organisation recognises through its ranks that the purpose for its existence is its customers, and all work and efforts must be centred on its customers (Oakland, 2003b; 256).

Total Quality Management (TQM): is a set of activities carried out by all in the organisation, management and employees, to effectively and efficiently achieve the organisation's objectives. This provides goods and services with a level of quality which meets and at times exceeds customer expectations. This management approach is characterised by its principles, practices, and techniques (Dean and Bowen, 1994: 394).

Quality Improvement (QI): In this study QI is defined as a formal approach to the analysis of performance and systematic efforts to improve it (Hughes, 2008:2). It begins with leadership's commitment to quality. Leadership is expected to make visible efforts in support for quality improvement, in communicating with all employees and making resources available. TQM programmes therefore require strong leadership (Inderlal, 2013:38).

Employee Involvement (EI): In this study EI, also referred to as employee management, refers to participation of employees in decision making, goal setting, empowerment by training and involvement in the activities of organisation.

Forensic Laboratory: In this study refers to laboratories which perform testing of exhibit materials or physical evidence for the purpose of providing a forensic report used mainly in criminal proceedings.

Forensic Science Laboratory: In this study, the FSL is a scientific laboratory of the South African Police Service, mandated to apply scientific techniques to analyse crime scene evidence in the process of criminal investigation.

Forensic Analyst: In this study, Forensic Analysts, also referred to as Forensic Scientists or Forensic Examiners, are employees of the South African Police Service that have the skill and knowledge required to apply scientific techniques and methods to process the forensic evidence in the laboratory. They may be required to collect forensic evidence in crime scenes.

ISO: ISO is not an acronym for International Organisation for Standardization, rather it's a contraction of "isos", a Greek word for equal. The founders of the organisation International Organisation for Standardization established the organisation ISO, as a body that provide industries and organisation around the world with equal standards on which to base management systems (OECD/ISO,2016:9).

Leadership: In this study is referred to as management of the FSL, senior and middle managers of FSL stationed in Pretoria Head Office.

Organisational Performance: In this study refers to the extent to which the organisation fulfils its performance objectives and targets (Gavrea, Illies and Stegorean, 2011:287).

Quality Management System: management system to direct and control with regard to quality by use of a set of defined requirements (Goetsch & Davis, 2002:173).

1.5 Rationale of the study

As indicated above, few studies have been conducted on the relationship between TQM and Organisational Performance in South Africa, and none found worldwide in the field of forensic science and laboratories. This view is backed by the results of a search under the title "TQM and Organisational Performance". Numerous search engines identified many studies, most from Middle Eastern and Asian countries, a few from South Africa and none in the forensic field or testing laboratories.

Many Forensic science laboratories worldwide have implemented TQM as a management system or have integrated it into their management system. In many laboratories, TQM is a key requirement for laboratory accreditation. The South African Police Service (SAPS) Forensic Science Laboratory (FSL) like the other laboratories has implemented TQM in the form of a Quality Management System.

The FSL has implemented a Quality Management System based on International Organisation of Standardisation (ISO) specifications. Over the years the laboratory has invested human, physical and financial resources for the implementation of ISO standards, or conformance to the requirements of ISO Standards. The end product of proof of implementation or conformance to ISO standards is either certification or accreditation, which provides assurance that materials, products, processes and services are fit for their intended purpose. This study attempted to demonstrate that TQM is not only a tool for ensuring fit for purpose products and services but an instrument for organisational performance.

There are many studies and research projects conducted on the effects of TQM on Organisational Performance for different industries, but none was found in the field of Forensic testing laboratories. Hence this study not only attempted to be amongst the few if any in the field, but also aimed to promote the TQM as a management system of choice at FSL. It thereby determined whether there was a return on investment, as the organisation has made huge investments in TQM implementation.

1.6 Research aim and objectives

1.6.1 Research aim

The general purpose of this study is to determine the effect of Total Quality Management practices on quality improvement and organisational performance at SAPS FSL. The study focuses on the widely used TQM aspects of Leadership, Employee Involvement and Customer Focus. These elements are also referred to as TQM constructs or practices. TQM critical success factors, developed by combining the work of quality gurus and academics, are analysed to determine their effect on organisational performance and quality improvement.

1.6.2 Research objectives.

In order to achieve the aim of this study, the objectives are outlined as follows:

- a) To develop a research framework indicating the relationship between the three TQM elements with quality performance or quality improvement; and the relationship between the TQM elements with Organisational Performance.
- b) To provide a theoretical background of TQM and the contribution of quality experts also referred to as quality gurus to the management theory of TQM;

- c) To conduct a critical synthesis of previous research papers that focused on TQM and Organisational Performance with the aim of identifying the TQM elements that are implemented to improve Quality and enhance Organisational Performance;
- d) To determine the relationship between TQM practices and organisational performance including quality improvement at the Forensic Science Laboratory, using Silverton and General Piet Joubert Buildings as case study.

1.6.3 Hypotheses

As indicated in the preliminary literature relating to TQM and OP, not all TQM elements have a positive link to improvement of quality, thus the hypothesis formulated are:

- Leadership of the Forensic Science Laboratory commitment to quality is positively related to the FSL attainment of its performance objectives and quality improvement.
- Involvement of employees of the Laboratory is positively related to organisational performance and quality improvement.
- Customer Focus is positively related to organisational performance and quality improvement.
- Quality improvement is positively related to organisational performance.

These hypotheses postulate that a certain kind of relationship exists between TQM and organisational performance. Hence the aim of this research is to specifically prove the hypotheses correct or incorrect at the South African Police Service: Forensic Science Laboratory.

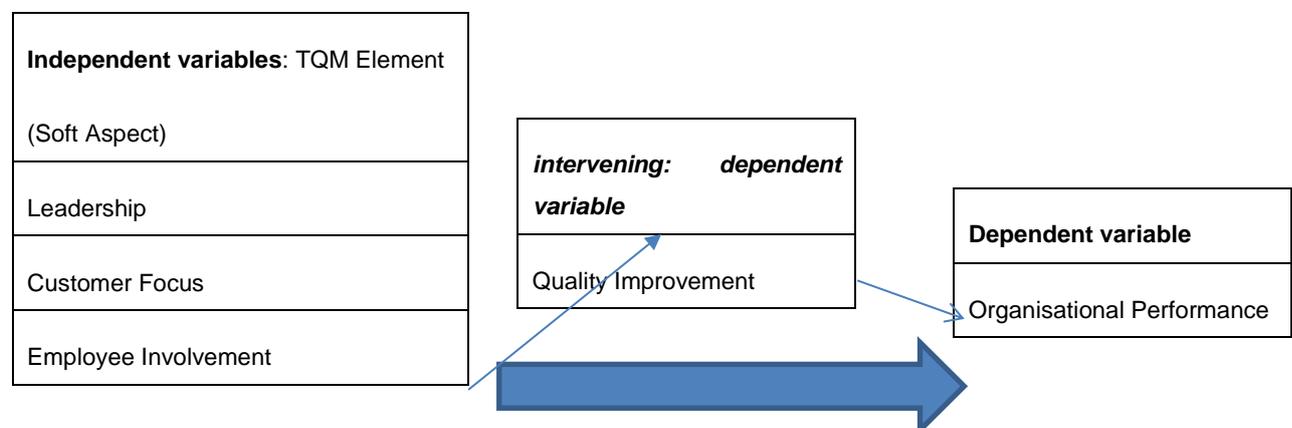


Figure 1: TQM Framework

1.6.4 Research design and research methodology

According to Bryman (2012:46), the research design provides a framework for data collection and analysis, and the research method is a technique for collecting data using data collection instruments such as questionnaires and interviews. This study adopted a descriptive format using non-empirical data from literature related to the research topic. It made use of questionnaires and interviews for the empirical study.

The non-empirical data for this study came from literature reviews of studies on the relationship between Total Quality Management and Organisational Performance as well as Quality Performance. The contribution of “Quality gurus” was also used to determine the application and benefits of Total Quality Management Practices in organisation and improving performance.

1.6.5 Population and sampling

The target population for this study was employees of the Forensic Science Laboratory (FSL) stationed at the Forensic Science Laboratory in Silverton and General Piet Joubert Building in Pretoria. The area of this study was the FSL in Silverton occupied by three of the six Sections of the FSL, namely the Chemistry, Scientific Analysis, and Ballistics Sections, and at General Piet Joubert Building accommodation the Questioned Documents Section.

1.6.6 Demarcation of the study

The Forensic Science Laboratories are located in Gauteng, which is the head office and laboratory processing large number of samples. Other laboratories are situated in Western Cape, Eastern Cape and Kwazulu Natal and deliver forensic services to the entire country including neighbouring countries. The FSL provides forensic services to the entire country including neighbouring countries.

1.6.7 Outline of chapters

Chapter 1 Outlines the brief background of the study, the rationale for this specific study; the aim of the study, the problem statement, the rationale of the study. It explains the research aim and objectives, study hypotheses, the problem statement, the research design and research methodology, study population and sample and finally its scope and demarcation.

Chapter 2 provides an insight into total quality management. It outlines the history, the use and application of the management system and explains the TQM practices using a variety of sources. The review of literature and studies evaluates the effects of TQM on Organisational and Quality performance.

Chapter 3 provides a detailed explanation of the research design and methodology, the research approach, the rationale for choosing the research design and approach for this study, the sources of data, data collection methods and instruments used to gather data and the methods of data analysis. This chapter also describes in detail the research process, including the piloting of questionnaires, distribution of questionnaires, data processing, reliability and validity of research instruments.

Chapter 4 covers SAPS FSL as a case study for analysis of the TQM effects on Organisational and Quality performance. The organisational background includes organisational structure and management committee, vision, mission and mandate of the organisation.

Chapter 5 provides the analysis of data and the presentation of the results. The research results are discussed in this chapter.

Chapter 6 presents the summary of findings illustrating the aim and objectives, significance and limitations of the study, conclusions and recommendations.

2 Chapter 2: Theoretical framework and literature review

2.1 Introduction

This chapter provides the definition of the concepts of TQM practices, Organisational Performance and Quality Performance. In addition, the history and evolution of TQM is discussed, and the contribution of quality experts, the relationship between TQM and quality management system (QMS) is outlined. Included in this chapter is the critical evaluation of past research and articles on TQM and Organisational Performance.

2.2 Quality, Total Quality Management and Quality Management Systems.

2.2.1 Quality

Quality is a subjective, perceptual, conditional attribute to a product or service received by customer (Kim-Soon). The concept of quality is defined differently by many and this concept has and continues to evolve (de Coning). Well known so called quality gurus and authors have also view quality in different ways. Juran, defined quality, as simple, fit for purpose; Crosby, define quality as conformance to requirements; Deming argues that “quality should only be when needs and expectations of customers are met”; Feigenbaum, quality is as results of contribution of all departments in the organisation, marketing, finance, manufacturing including human resource department and all other department that support products or service offered by organisation; and according to Oakland, who support Deming, sees quality, as simply meeting the customer’s requirements (Knowles, 2011:10; de Conning, 2009:15).

Quality is a customer- driven concept that gain recognition in the late 1980’s and early 1990’s. The individual elements or practices are still used today by many organisation around the world (Goetsch & Davis, 2014:1).

Goetsch & Davis (2014:2), defines, Quality as a dynamic state associated with products, services, people, processes, and environments that meets or exceeds customer needs and expectations and aids in producing superior value.

Although there is no consensus or one universally accepted definition of quality, enough similarities does exist among these many definitions that common elements can be extracted, these common elements led to the birth of Total Quality. These

elements, products, people, services, processes and environment are critical in making quality not only about product and services but includes all activities and resources that bring about goods and services (Goetsch & Davis, 2014:2).

By using the above progressive view of quality as indicated by different quality gurus and authors, this study explores the concept from the view stated above. Quality is the end point and the means to “get there”, is quality management of which this study is based

2.2.2 Quality Management

If quality management is the means to the end, then processes and approaches based of quality management are explored in this study. There are many principles central to quality management that were established by quality gurus, Juran, Crosby, Deming, Ishikawa and Feigenbaum that are used as foundation for quality management and ISO's quality management system.

The key quality management principles derived from work of quality gurus are:

- Customer focus: If value needs to be created for organisations customers, then understanding the needs and expectation of customers must be key to the organisation;
- Leadership focus: If leaders in the organisation are not committed to the strategic objective of the organisation, then no goals will be achieved by that organisation;
- Strategic focus: quality management must form part of organisations strategy. Each and every activity in the organisation must be quality orientated;
- Process focus: many organisations are focused on the final product. This is seen when “checks and balances” or quality inspections are done on final product and not of processes and procedures that are used in the organisation. This principle of process focus, emphasises that assessments should be done on every process and at every step throughout from begin to end.
- People focus: Quality management places people at centre. The behaviour, culture and role played by every employee in the organisation leads to success of any organisation.

- Scientific focus: Quality management is based on a scientific methodology of Plan, Do, Check, Act. This is a cycle methods where decisions are evaluated based on evidence and these are acted upon and measured if they are effective and that information is then used for any future decision to be taken by organisation.
- Continual Improvement: At the heart of quality management is dissatisfaction is status quo, and thriving to find improvement opportunity. This does not mean change what is working, but that every situation can be constantly improved.
- System thinking: Quality Management advocates working as unit and not in “silos”. It emphasizes on creating synergies between the elements and deliver a whole which is greater than sum of different parts

(Knowles, 2011:12)

Quality Management is therefore a method of ensuring that all activities from planning to implementation, designing, developing and manufacturing in order to have product or services including, policy, objectives, and organisations goals must be customer oriented.

2.2.3 Quality Management Systems

Quality management just like quality is a contested area, whereby different views and approaches exists. To overcome this quality gurus, quality experts, industry experts through their representatives from all over the world have formed an organization that aim to bring consensus in the field of quality and formulate standards that are general accepted by everyone or by many with the aim of developing guidelines, rather than prescriptive manual, to help organization to achieve its goals. These standard are referred to as Quality Management Systems (Knowles, 2011:38).

The International Organization for Standardization (ISO) is an international non-governmental organization established in 1947 to promote standards in international trade. ISO does not consider itself or the standards they produce as some form of regulation, however this does not stop countries to use the Standards as regulation (OECD/ISO, 2016:9). The organization has no power and no aim to impose its standards, but countries use these Standards as guiding documents to assist them to implement and maintain total quality management (Goetsch & Davids, 2002:3).

ISO standard 9000 is a family of standards and guidelines related to Quality Management System. This is a generic standard that is applicable to any organization that wishes to implement a quality management system (Goetsch & Davids, 2014:246).

Laboratories including the Forensic Science Laboratory implements ISO 17025, which is a standard based on ISO 9000 but more specific to testing laboratories. When a laboratory implements and conforms to ISO 17025, automatically it conforms to ISO 9000 and not vice versa. ISO 17025 is the standard for the Generic requirements for the competence of testing and calibration laboratories applicable to only testing and calibration laboratories.

ISO 9000 is a foundation for all another ISO Standards, and is structured into different clauses or elements. These come directly from the principles of TQM, which emanates from the framework of quality gurus. The manner in which they are structured follows the Plan – Do- Check –Act (PDCA) cycle, the work of quality guru, Dr. Deming (Goetsch & Davids, 2002:5).

ISO standards are meant to economic efficiency and to facilitate international trade by enabling products and services produced in one country to be of use in another country (OECD/ISO, 2016:11).

2.2.3.1 The ISO 9000 elements

Customer focus – it's the understanding of the customer needs, striving to exceed their expectations (Goetsch & Davids, 2002:5). Everyone in the organization must understand that without customers there will be no need for the organization to exist.

Leadership – establishment of the unity of purpose, establishing direction and supporting the work environment (Goetsch & Davids, 2002:5). Leadership of the organization must be committed to continuous improvement, and this commitment must be visible through management actions (Pekar, 1995:3).

Employee involvement – ensures that every employee is able to make a meaningful contribution for the benefit of the organization (Goetsch & Davids, 2002:5).

Process approach – recognizing that all work done in the organizations must be done so through a process and it must be clearly understood by all and managed

accordingly (Goetsch & Davids, 2002:5). The process orientation addresses the means and not just the ends (Mansir & Schacht, 1989:6).

System Approach to management – management that ensures improvement of the entire system and not just parts of it (Mansir and Schacht,1989:6) and ensures achievement of any objective a system of interrelated processes that are constantly improved as a whole (Goetsch & Davids, 2002:5).

Continual Improvement – recognizing that no process is so good that it does not need improvement and to ensure dynamic and adaptive processes over time (Goetsch & Davids, 2002:5; Mansir & Schacht, 1989:6).

Factual approach to decision making - sound decisions must be based on credible and reliable information. There must be investment in knowledge that leverages the effectiveness of the improvement process (Mansir and Schacht, 1989:6).

Mutual beneficial supplier relationships - synergy can be found in such relationships (Goetsch & Davids, 2002:5). Suppliers play an important role and the relations with them are important for any organisation.

2.3 The concept of Total Quality Management (TQM)

In managing and achieving quality, the focus is not only on quality product or service but also on the systems, processes to achieve it. Thus quality management uses management techniques and tools throughout the organisation using every resource in the organisation to achieve product or service quality. The use of every resource in the organisation is known as Total Quality Management (TQM). The practices or principle, referred to others as aspect, is a combination of work of quality gurus and quality practitioners. Organisations use a combination of one or more of this practices, a choice that is dependent on the nature of their business and what the organisational performance goals are (Goetsch & Davis, 2014:3-5).

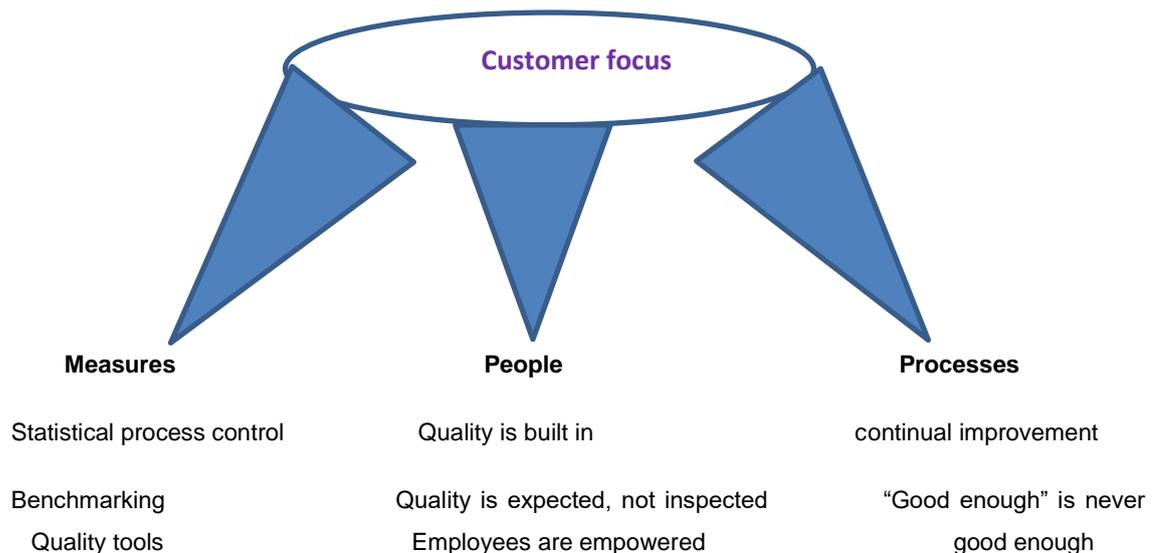


Figure 2: Three-Legged Stool of Total Quality

Source Goetsch & Davis (2014:3)

There is no single definition of TQM, but the work of numerous authors, scholars and quality practitioners has resulted in many definitions of the concept. As an example, the American Society for Quality (ASQ) has defined TQM as a management approach to long-time success of an organisation through customer satisfaction. It involves effort from all members of the organisation for continual improvement of products, processes and services including the working culture (ASQ: 2017).

TQM is also defined as a management philosophy seeking to bring all organisational functions and activities to a focus on customer needs as a key to attaining organisational objectives (Nassef, 2009:2). It is also defined as a management framework based on the belief that organisations can build long term success by having all their members, at any level, to focus on quality improvement which eventually result in customer satisfaction. Another definition describes TQM as a way to do business through people, leadership, values and culture with customers as the main focus (Oakland, 2003a:18).

Porter and Tanner (2005) define TQM as a management approach which focuses on improving the efficiency and effectiveness of processes of an organisation as well as organisation’s responsiveness to customer and other stakeholder needs, this achieved by actively harnessing employees’ skills and competencies that enable performance improvement.

Despite being different therefore, the above definition and many others in one way or another all centre on organisation resources, human resources, physical resources and customer focus.

TQM is described in many other studies (Fapohunda, 2012; Nekoueizadeh & Esmaeilli, 2013) as a management approach used by many organisations. It is based on the premise that quality is the responsibility of every member of the organisation. It is aimed at long-term success through customer satisfaction, and beneficiaries of the success are the organisation's employees, customers and society. It involves making constant effort to reduce defeats, identify areas of improvement, and identify customer needs and ways to increase customer satisfaction.

TQM culture involves continuous learning and adaptation to changes in customer needs, operational methods and changes in technology. It requires establishment and maintenance of quality standards in all operational and managerial aspects of the organisation. It is considered as a management system that constantly evolves with time, with the aim of increasing internal and external customers' satisfaction with a use of less amount of resources (Fapohunda, 2012:2).

Human Resources are the key drivers in TQM, as they are a source of ideas and innovation. Employee expertise, knowledge, skills and co-operation have to be harnessed for the effective implementation and success of the management system (Fapohunda, 2012:3). TQM consists of organisation-wide effort, however leadership of the organisation plays a critical role in the establishment, implementation and maintenance as well as success of the management system.

2.4 History of TQM

Total Quality Management (TQM) began to shape the culture of many organisations as early as 1950. It was originally intended for the manufacturing sector, but later it evolved into a generic management tool that has been applied in nearly all sectors (Germain, Bird and Labuschagne, 2011:100). It has evolved from the use of management tools such as statistical process control (SPC), just-in-time and benchmarking to being a management system that encompasses behavioural methods for the customer focused organisation. It involves all employees of the organisation as well as customers for continual improvement of organisational performance. All employees participate in working towards common goals (Sousa-

Poza, Nystrom and Wiebe, 2000:745; Dean and Bowen, 1994:396). In the early 1990s, quality management principles started finding their way into service industries.

One of the early leaders in the field of QM, DR Edward W Deming (1900-1993) introduced the concept of TQM, and made it an important enough issue to catch the attention of many managers and researchers (Mukonyo, 2014:1). It is now recognised as the most popular productivity programme in South Africa as well as internationally (Wärnich, Acarrell, Albert and Hartfield, 2015:153).

Managers have started to realise that “quality of management” is more important than “management of quality”, resulting in the birth of TQM. TQM is an integration of quality principles into organisations’ systems. Many managers have begun to recognise that all fundamental organisations’ activities such as leadership, human resources, policy and decision making, strategic planning need to be in line with TQM to enable the organisation to achieve its goals. The notion of TQM has therefore evolved from its initial use in manufacturing to a concept of performance excellence which aligns all organisational activities, and contributes to organisational effectiveness (Masejane, 2012:4).

Successful implementation of TQM involves three main approaches: contributions of quality gurus, quality management standards such as ISO 9000 series, and formal evaluation models – award based quality framework as well as academic based quality framework (Inderlal, 2013:14; Jaafreh and Al-abadallat, 2012:95).

2.5 Contribution by quality gurus

The contribution of quality gurus such as Dr W Edward Deming (1900-1993), Dr Joseph Juran (1904-2008), Philip Crosby (1926-2001), Armand Feigenbaum, Kaoru Ishikawa, and many others had an influence upon later studies about TQM in such a way that the literature on TQM evolved. These gurus suggested various frameworks to quality management, and whilst specific details may differ, there are some common elements in these frameworks (Inderlal, 2013: 14-20).

For example, Dr W Edward Deming introduced the concepts of TQM with 14 steps to improvement and the Plan-Do-Check-Act (PDCA) Cycle, still used today in many management practices, including its use in International Organisation for

Standardization (ISO) Standards such as ISO 9000, ISO 14000 and many other series (Jaafreh & Al-abadallat, 2012:95; Germain, Bird & Labuschange, 2011:100).

Dr Joseph Juran, a pioneer in quality, developed emphasises the importance of balanced approaches using managerial, statistical tools, and technological concepts of quality. He developed what is commonly referred to as the quality trilogy, which is quality planning, quality control, and quality improvement (Gryna, Chua & DeFeo, and 2007:10). He is credited as have introduced the Pareto Principle as early as 1941. This principle states that approximately 80% of the effects come from 20% of the causes (Germain *et al.*, 2011:100).

Phillip Crosby defines quality in relative simple terms of “conformance to requirements”. He introduced the DRIFT Principle: “Do it Right the First Time, which is the concept of zero-defects to quality” (Germain *et al.*, 2011:101). His work demonstrated that every employee in an organisation can be motivated to pursue continual improvement. It can only be achieved if there are adequate resources and people, continually trained and motivated to perform better (Gryna, Chua & DeFeo, 2007:10).

Armand Feigenbaum introduced the concept of total quality control in 1950. He proposed the three steps to quality as Quality Leadership (a commitment by top management); Modern Quality technology (quality of process and products); and Organisational Commitment (involvement of all employees). His framework emphasises the integration of people, machines, process and information. He defines total quality control as a powerful foundation of TQM, and that quality is the responsibility of every single person in the organisation from low level employees to top management (Jaafreh and Al-abadallat, 2012:95).

Finally, Kaoru Ishikawa a Japanese Quality guru based his work on that of Deming, Juran and Feigenbaum (JUSE, 2018:2). He introduced the concept of quality circles and developed the Japanese style of Total Quality control (TOC) called the Company Wide Quality Control (CWQC). He defines quality control as developing, designing, producing, marketing and servicing goods with optimum cost efficiency for the main purpose of meeting customer’s need and expectations (Jaafreh and Al-abadallat, 2012:95). One of his well-known achievements is the “cause and effect diagram”

popularly known as the Ishikawa diagram. He developed the rigorous audit system that determines whether companies qualify for an award. He wrote several books explaining statistics to non-specialists (Wallach, 2011:4).

The above list of gurus is not exhaustive of all those who made a contribution to the philosophy of Total Quality Management. The common elements from the different frameworks are Leadership, Customer focus, Total employee Involvement, Process-centred approach, Strategic and Systematic approach, Continual improvement, Factual approach to decision making, Mutual beneficial supplier relationships, Integrated Systems and Communication (Goetsch & Davis, 2002:16; Mansir & Schacht, 1989:6).

It is evident that quality gurus listed above and many others not mentioned in this study have established various frameworks to quality management. Whilst the work of quality gurus are not the same, there are elements that are common across various frameworks, and these common elements gave rise to elements of TQM. The table below illustrates the common elements across different frameworks.

TQM Elements	Deming	Feigenbaum	Juran	Ishikawa	Crosby
Leadership Commitment	x	x	x	x	x
Employee Involvement	x	x	x	x	x
Customer Focus	x	x	x		
Quality improvement instead of quality inspections	x	x			
Strategy, policy and firm wide control		x	x	x	x
Designing system based on prevention	x	x	x	x	x
Quality first and schedules are secondary	x	x	x	x	x

Figure 3: TQM Guru common elements

Source: Neyestani (2017:15)

2.6 TQM and Quality Management Systems

Total Quality Management is composed of three aspects, i.e. Total – which refers to organisation-wide; Quality- with its many definitions, and Management- the system of managing quality, which includes planning, organising, controlling and leading. Whereas Quality Management System is the collection of an organisation's processes focused on meeting customer requirements and optimising resources to achieve the organisation's goals and improve performance.

2.6.1 The relationship between TQM and QMS

Although both ISO 9000 and Total Quality Management are quality initiatives, they are not the same and never will be, despite ISO 9000: 2000 made a great leap towards TQM. ISO 9000 and TQM originated independently from each other. ISO 9000 series was developed in response to the need to harmonise dozen of international standards that existed throughout the world. This standard was first introduced in 1987, at that time Total Quality Management already existed. ISO 9000 is concerned with quality management systems for the design, development, purchasing, production, installation, and servicing of products and services, whereas TQM encompasses every aspect of organisation, all elements of ISO 9000 including systems such as human resources, finance and marketing, which are not covered in ISO 9000 (Goetsch & Davids, 2014:250).

In TQM, management of the organisation is responsible for developing the vision and mission of the organisation, and ensuring that tactics and strategies are in place and implemented to achieve the vision and mission. TQM is based on teaching of quality gurus (Goetsch & Davids, 2014:251).

The main difference between TQM and ISO 9000 is in the degree in which TQM is involved. TQM requires involvement of all functions and all levels, from top management to entry level in the organisation, whereas ISO 9000 only requires functions and levels that are involved in direct realisation of products and services, and not those functions that have indirect roles, such as finance, marketing and human resources (Goetsch & Davids, 2014:251).

Characteristics	ISO 9000	TQM
Customer focus (internal & external)	x	x
Obsession with quality		x
Scientific approach to problem solving	x	x
Long-term commitment	Partial	x
Teamwork		x
Continual process and product improvement	x	x
Education and training intensive	x	x
Freedom through control		x
Unity of purpose	x	x
Employee involvement & empowerment	Partial	x

Figure 4: TQM & ISO 900 Compared

Source (Goetsch & Davids, 2014:251)

Figure 4 illustrate how close ISO 9000 evolved but not at same level as TQM.

TQM is an approach to doing business that attempts to maximize competitiveness of an organisation through the continual improvement of the quality of its processes, systems, products, services, people and the environment, whereas ISO 9000 pays more emphasis on product and service quality (Goetsch & Davids, 2014:251).

ISO 9000 is compatible with and can be viewed as a subset of TQM. The two are not in competition. ISO 9000 can be used as an entry to TQM. ISO standards requires updating, whereas TQM is a concept that evolves “naturally” (Goetsch & Davids, 2014:251).

2.6.2 Assessment Models of Quality

In addition to quality standards there are a number of widely accepted and recognised models used to promote service excellence. These assessment models are based on work by Quality gurus, Deming, Juran and many other quality practitioners.

The Deming Prize named in the honour of Dr W Deming, “Quality Guru” by the Japanese Union of Scientific and Engineers (JUSE) and follows the scientific quality principle of the Plan, Do, Check, Act, (PDCA) cycle. The assessment criteria for this tool are company policy and planning, organisation, quality control, quality education,

quality information handling, standardisation, quality assurance and future plans of organisation (Knowles, 2011:44).

The Malcolm Baldrige National Quality Awards named after Malcolm Baldrige, a United State Secretary of Commerce and Industry who was championing a quality cause, put more emphasis on customer satisfaction. The assessment criteria are strategic planning, customer focus, measurement and analysis and knowledge management amongst others, to foster service excellence (Knowles, 2011:44).

The European Foundation for Quality Excellence Award (EFQA) was established by a consortium of 14 European multi-national organisations, follows the Baldrige model. This model advocates for a balance between enablers, that is, people; leadership; strategy, partnership & resources to achieve results (Knowles, 2011:45).

2.7 TQM and performance enhancement: Formal evaluation models and award based framework

Independent assessments and self-assessments have been used for many years as an important tool for continual improvement and for gaining competitive advantage over peers. Independent assessments are conducted by external bodies, whilst self-assessments are conducted internally in an organisation (Eriksson, 2002:10).

TQM awards determine quality criteria for competing firms to assess their performance. These include the Deming Prize, Japan; Malcolm Baldrige National Quality Awards MBNQA, USA; European Quality Awards (EFQM), Europe; and South African Excellence Model (SAEM) (Uysal, 2012:451).

2.7.1 Deming prize

Dr W. Edward Deming, not only taught Japanese students statistical theory, but also self-confidence. He contributed to the success of many industries in Japan and was also instrumental in helping Japan during the 1951 census. As a teacher he mentored the likes of Ichiro Ishikawa who later became a pioneer in the field of Quality. Ishikawa was at the time the president of the Union of Japanese Scientists and Engineers (JUSE). Deming returned some of the fees from his work in Japan asking it to be used for the development of Quality improvement for Japanese industry. This resulted in the JUSE deciding to honour Deming by establishing the Deming Prize (Kudtarkar, 2018:1-2).

The award was initially given to Japanese companies for their consistent improvement in performance quality. The five main criteria that must be met or are used to determine award winners are stated below. These criteria not formally structured into a model as with other national quality awards discussed in this study such as MBNQA, EFQM and SAEM:

- With clear management policies that reflect its management philosophy, industry, scale and environment;
- Have established proactive customer focused objectives and strategies;
- Top management must exhibit leadership in their formulation;
- TQM is suitability utilised and implemented; and
- Organisation must demonstrate capacity for future growth

(JUSE, 2018)

The Deming award considers the zero defects achieved, with organisational process more important than business results, “means more important than end” (Uysal, 2012:453). The award is now international, offered annually to any organisation or business that can demonstrate not only that TQM has been implemented but that TQM assists in setting and achieving performance objectives (Kudtarkar, 2018:2; JUSE, 2018:2).

2.7.2 The Malcolm Baldrige National Quality Award (MBNQA)

The Malcolm Baldrige National Quality Award (MBNQA) was established by the United States of America (USA) congress in 1987, named after Malcolm Baldrige, who served as United States Secretary of Commerce during President Ronald Regan’s administration. Baldrige passed away while the bill was in Congress. President Regan passed it into law in 1987 (Oakland, 2000:100). The MBNQA is awarded annually by the President of USA to US organisations that achieve excellence in quality improvement and quality management. It sets very high standards for quality, and to win, one has to demonstrate that the processes and systems are of superior quality and that provide evidence of customers (Oakland, 2003a:100).

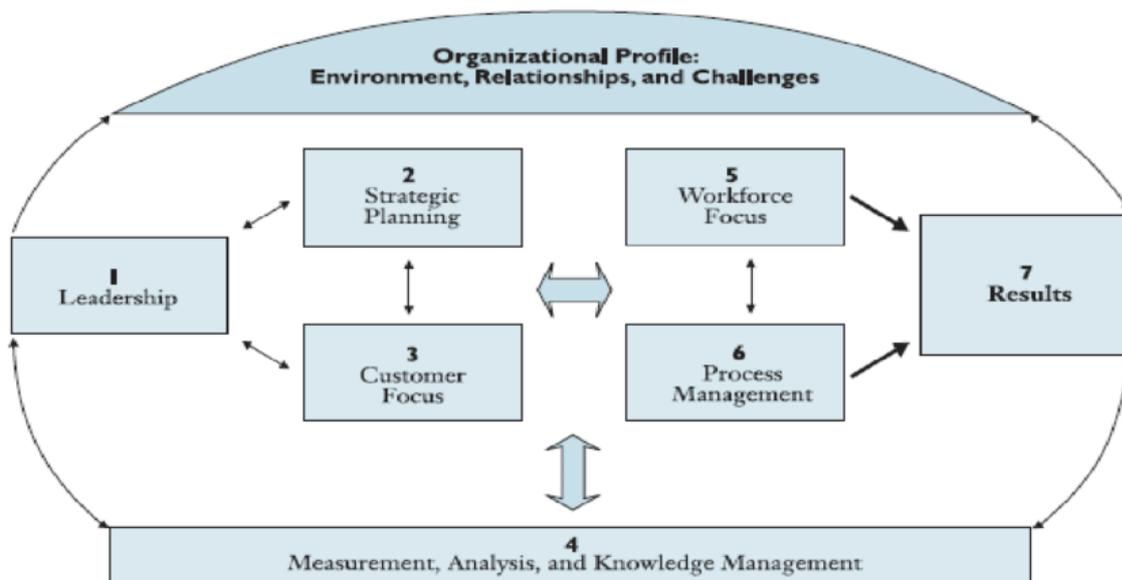


Figure 5: Malcolm Baldrige National Quality Model

Source (Oakland, 2003b:100)

The criteria used to assess organisations for performance excellence are:

- Leadership: How top management leads the organisation and the organisation's leadership role in the community is served;
- Strategy: How the organisation's strategy is established and implemented;
- Customers: How organisations establish, implement and maintain lasting customer relations;
- Measurement, analysis and knowledge management: How data is used by the organisation to support and enhance performance;
- Workforce: How the organisation empowers its employees and how they are involved in decision making;
- Operations: How processes are established, managed and improved;
- Business results: How an organisation performs in terms of customer satisfaction, finances, human resource development and utilisation, supplier performance, governance, social responsibility, operations and how it performs in relation to its competitors.

(Oakland, 2003b:100)

The Baldrige Award is a guide for organisations to establish an integrated framework to achieve organisational performance for quality. The criteria used for assessing

performance are strategic planning, organisation's leadership, organisation's customer and market focus, human resources, information and analysis, as well process management and business results (Uysal, 2012:452).

Many organisations use the Baldrige criteria to conduct self-assessments rather than for winning the prize. The criteria are designed to assist organisations to achieve customer value and organisational performance (Gryna, Chua & DeFeo, and 2007:49).

2.7.3 The European Foundation for Quality Management (EFQM)

The European Foundation for Quality Management (EFQM) was established as an Excellency model that can be used or applied by any organisation irrespective of type and size to attain excellence. This model is a non-prescriptive framework that recognises and appreciates the many approaches that an organisation elect to employ to achieve and sustain excellence.

The model identifies members of an organisation as “enablers”, who effectively share their knowledge and experience. It ensures that all management practices used by the organisation form a coherent system for continual improvement and for achieving organisation performance goals.

The model is based on nine criteria; five are “enablers” and the other four are “results”. “Enablers” are what the organisation business does and how it's done, whereas “results” criteria cover what is achieved by the organisation.

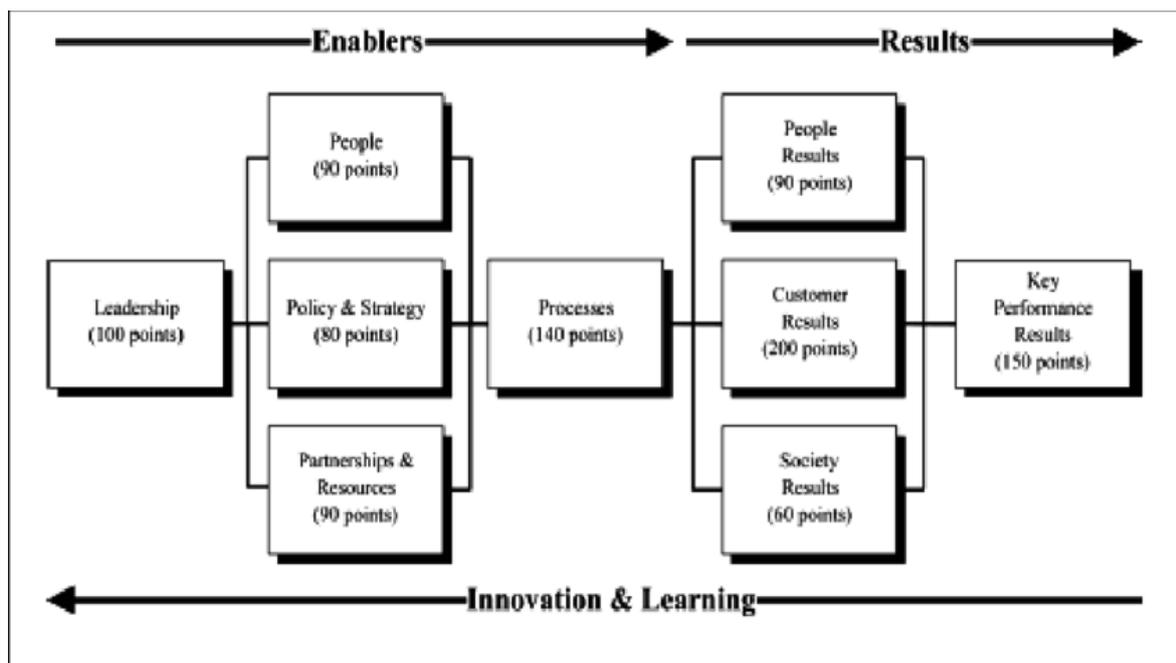


Figure 6: European Quality Award Framework Model

Source (EFQM, 2017)

The “enablers” criteria are:

- Leadership: Excellency is achieved when leadership of an organisation acts as a role model for values and ethics, playing a key role in shaping the future and making things happen. Leaders are expected to be flexible to enable the organisation to adapt to changes in the business environment.
- Strategy: Excellency is achieved when organisation’s mission and vision is focused around its stakeholders.
- People: Excellent organisations value their human capital more than any other business resource. Fairness and equality and development of people’s capabilities are the cornerstone for this criteria. Caring, communication, rewarding and recognising is seen as an excellent motivator that results in performance attainment.
- Partnership and resources: Excelling organisations plan and manage partnership with all stakeholders and manage internal resources effectively and efficiently.
- Process, products and services: Excellent organisations ensure that their product designs, the process, products and services generate increasing value to customers.

The “results” criteria are what organisation achieves:

- Customer results: Excellent organisations ensure that they achieve outstanding results that meet or exceed customer needs and expectations;
- People results: Is when employee’s needs and expectations are fulfilled;
- Society results: Is when needs and expectations of the community are achieved; and
- Business results: Is when business stakeholders are pleased and their needs and expectations are met.

(EFQM, 2017)

Baldrige focuses on organisational performance, while the Deming Prize focuses on organisation; on the other hand the EFQM focuses on business excellence (Uysal, 2012:455).

2.7.4 The South African Excellence Model (SAEM)

Organisations and businesses that hope not only to survive but to attain competitive advantage need to strive for excellence in all aspects of their business. Excellence models provide organisations with a tool for assessing excellence. This is achieved by adopting and promoting a culture of continual improvement (Williams, 2008:37).

In the South African context, the South African Excellence Model (SAEM), which is based on the EFQM and MBNQA, was developed and launched in 1997. Similar to the EFQM, this model is also non-prescriptive, and uses eleven criteria to evaluate organisation’s strengths and areas of improvement (Ladzani, 2016:12). These self-assessment criteria are used measure the level of performance by evaluating organisation’s impact on community, employee, suppliers and customers (Roodt, 2007:19). The eleven criteria are categorised into “enablers”, and “results” are illustrated below.

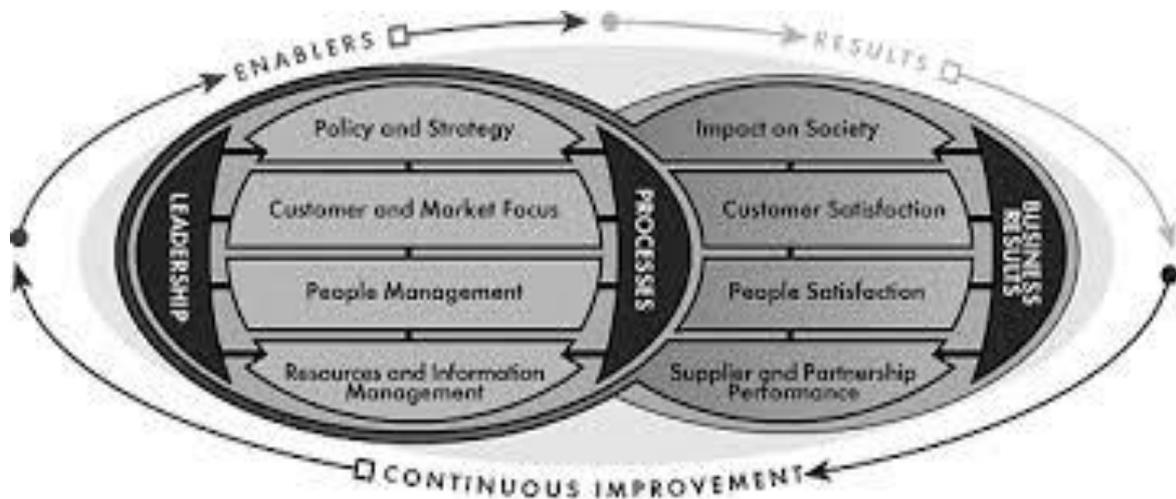


Figure 7: South African Excellence Model

Source (SAEF, 2006:2)

- Leadership: How the conduct and behaviour of top management and other senior leaders of the organisation inspire and lead others and how they support and promote a culture of business excellence;
- Policy and Strategy: How organisations formulate, implement and review policies;
- Customers and Stakeholders: How the requirements, needs and expectations of customers are determined. It focuses on how relationships with customers and other stakeholders are enhanced, how complaints are managed, and how customers' and other stakeholders' satisfaction is determined;
- People Management: How management releases the full potential of the employees; how employee's capabilities are developed and sustained; how employees are involved, enabled and recognised;
- Resource and Information Management: Indicates how effectively and efficiently resources and information is used by an organisation. It focuses on how well financial resources, assets, technology, equipment and buildings are managed;
- Processes: How the organisation identifies, manages, reviews and improves its processes;
- Impact on society: How the organisation is performing in terms of the needs and expectations of the local, national and international community;

- Customer satisfaction: What the organisation is achieving in relation to customer satisfaction;
- People satisfaction: What the organisation is achieving in relation to the satisfaction of employees;
- Supplier and Partnership Performance: How supplier's relations and partnerships are achieved
- Business results: What the organisation is achieving in relation to its planned business objectives and in satisfying the needs and expectations of other stakeholders.

(SAEF, 2006)

2.8 The basic principles of TQM

Quality practitioners and TQM advocates have identified some basic principles which are instrumental in the successful implementation of TQM. These principles have been reduced to eight due to their wide use. Many practitioners have commonly identified these as Customer Focus, Leadership, Involvement of People, Process Approach, Continual Improvement, Factual Approach to Decision making and Mutual Beneficial Supplier Relationship.

Based on the literature reviewed, customer focus, involvement of employees and leadership, were found to be the widely used TQM principles for studies that aim to investigate the effect of TQM on organisational performance.

2.8.1 Customer focus

The first and most important of all TQM practices is the attention granted by a TQM company to its clients. This principle allows the organisation to identify, understand and eventually meet the customer needs and expectations. The process starts by the organisation identifying its customers and what products or services they require. Each customer's specific needs and expectations are then identified and translated into requirements and specifications for products and services. Measures to meet these requirements and specifications are translated into key performance areas, which are the organisation's performance objectives and targets.

Furthermore the TQM principle of customer focus requires organisations to state the measures which will be employed to meet the customer needs and expectations. The

organisation is required to provide evidence of communication channels with its customers and that customers' views, opinions and inputs are considered. This principle includes a customer complaints process.

2.8.2 Employee Involvement

Many organisations view humans as their most important resources. TQM advocates prioritise employee satisfaction, unlike Human Resource Practitioners, who focus on performance. TQM practitioners assume that satisfied employees are the cornerstone for continual improvement and better performance (Dean and Bowen, 1994:402). This TQM principle recognises that employees at all levels are vital to the attainment of their organisation's goals and objectives. The impact of human resources in the organisation depends on the kind of empowerment given to them.

The role of employees in TQM differs to those in non-TQM organisations. In TQM, employees at all levels in the organisation are empowered to make decisions relative to the quality of processes in their respective work areas. All employees at all levels in the organisation are provided with an opportunity to make inputs, and their contributions are valued and their suggestions are implemented. In order for employees to perform this function or play a meaningful role in the organisation, employees are given continual and extensive training.

This principle consists of an organisation involving all staff members in decision making, problem solving and endeavours to improve performance. Organisations must create an enabling environment for employees in their respective levels to make meaningful contributions to its performance objectives. Organisations are required to constantly monitor employee's competence and proficiency to perform assigned tasks and create a platform for information sharing.

Deming designed the TQM model of profound knowledge. According to Deming's model, the dynamics of people in the workplace and the different cultures and psychology of employees if not understood by management, may cause significant ruination to the organisation and its ability to achieve its performance goals and objectives. The model requires the use of a scientific process to gain more knowledge about the systems of the organisation. One way to achieve this is to involve employees.

2.8.3 Leadership

This TQM principle ensures that top management and management structures are involved in quality management. Leadership or top management is expected to possess a vision for quality, share that with all employees and involve employees in the implementation of quality management. They must promote TQM by being directly involved in solving problems; rewarding employees for participation in continual improvement; they must create the organisational environment, culture, and values in which TQM can thrive (Eriksson, 2002:9).

Leadership is expected to establish and support quality systems, and proof of that must be provided in documentary evidence of records and processes. Leadership are drivers of the system, so their understanding of the organisation's processes and ensuring quality systems are implemented.

2.9 Organisational Performance, Performance and Quality Improvement

2.9.1 Organisational Performance

The concept of organisational performance, as it is defined in Business Dictionary and Market Business News, it involves analysing a company's performance, one or a combination of financial performance, market performance and shareholder value performance, against its objectives and goals. In some cases production capacity performance is analysed. In general, organisational performance is real output compared with intended output.

Organisational Performance has always had an influence on the strategic, tactical and most on operational direction and decision of companies. The management systems employed in many companies is influenced by quest to attain performance goals.

Brignall, Fitzgerald, Johnston & Silvestro (1991:36) performance model takes six dimensions into account, and divided these into, determinants and results. The four determinants are resource utilisation, flexibility, innovation and quality of service and the two results are, financial performance and competitiveness.

In the quest for attaining performance goals, companies, will increase their workforce, implement new technologies, change structure and culture, change work behaviour, change production process, change company philosophy, improve on customer

services and employees interaction (Barton & Marti,1998:191 and Brignall *et al*, 1991:35).

Elena-Iuliana & Maria (2016), indicated in their paper cited Profiroiu (2001), definition of organisational performance in the public sector, as the existence of a relationship between objectives, means, and results so that performance is the result of simultaneous exercise of efficiency, effectiveness and adequate budgetary process. This can only be achieved by employing a suitable management system, which is understood by anyone in the organisation, as organisational performance relates to how successfully an organized group of people with a particular purpose perform a function. TQM practices of leadership, customer focus and employee involvement are ideal to a laboratory environment, where quality of output is key.

2.9.2 Quality Improvement

Quality Improvement is process of determining the difference between actual and desired performance and then implementing or adapting organisation's process to address the gap (Kaydos, 1999:5).

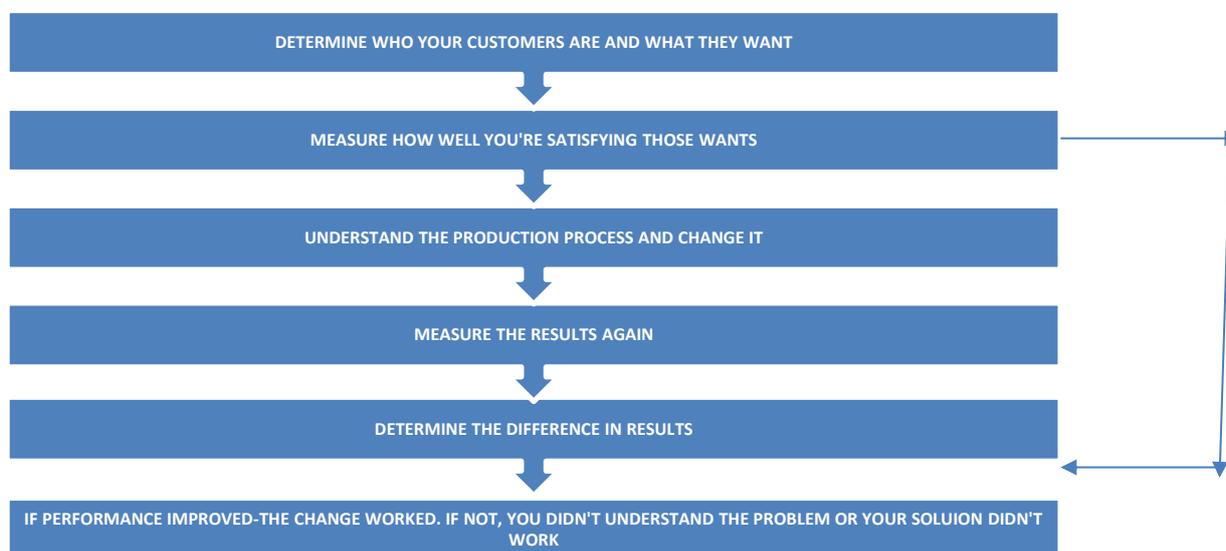


Figure 8: Quality Improvement Process

Source: Kaydos, (1999:6)

To make quality improvement to work in an organisation, the measure as illustrated in Figure 3, above, must be implemented. Attempts to improve performance without

following the steps in the illustration above is like shooting at targets in the dark (Kaydos,1999:6).

Organisations typically have three levels of goals: strategic, tactical and operational. This study focuses on operational goals. These are goals or target or future end results set by lower management that addresses specific measurable outcomes required from lower levels. Goals at operational level must be achieved in order to reach tactical and strategic goals (Bartol & Martin,1998:194).

2.10 Effects of TQM elements on quality improvement and organisational performance

2.10.1 Effect of top management and leadership on organisational performance

Inderlal (2013: 108-110) determined the impact of TQM element of leadership on Organisational Performance and Quality Improvement and established that of all the TQM elements of leadership showed significant positive relationships with both Quality Improvement and Organisational Performance. Leadership's provision of adequate resources and creation of employee awareness of the importance of customer satisfaction were the key contributors to quality improvement and organisational performance. However, the study revealed that leadership failed to communicate organisational policies and goals throughout the organisation, failed to motivate all employees to continuously improve quality of products and did not encourage participation of suppliers in improving quality. Supplier involvement is important in the manufacturing industry in which this study was based. Failure of leadership to involve suppliers, to motivate employees and understand changes in the market led to a significant drop in the organisation's performance against its peers.

Chepkech (2014:33-37) added that willingness of leadership to commit organisational resources in support of total quality management had a significant impact of performance of learning institutions in Kenya. The leadership support of quality policies, selection and appointment of staff based on merit contributes to success of tertiary institutions. Jørgensen & Nielsen (2013:66), on the other hand, identified that although leadership showed a significant influence on organisational performance, that influence is far less than customer focus. The same was found by Chepkech (2014). Inderlal (2013:120) on the contrary discovered leadership to be the only TQM

element that had a significant influence on organisational performance, with customer focus only contributing to quality improvement.

Many other studies that investigated the link between leadership or top management commitment and organisational performance have reported a strong and positive link between the two (Samson & Terziovski, 1999; Al-Damen, 2017; Jaafreh & Albedallat, 2013; Zehir C, Ertosun, Zehir, S, Muceldilli, 2012; Sabella et al, 2014). Green (2017) argued that amongst the reasons for TQM failures in enhancing and improving performance and attainment of set goals is the lack of top management support, which eventually leads to collapse of the system.

2.10.2 Effects of top management and leadership on quality improvement

Inderlal (2013:112), indicated a significant and positive relationship between leadership of footwear organisations studied and quality improvement. This was attributed to top management's communication of customer requirements, communicating of quality goals and policies throughout the organisation and provision of resources. Jørgensen and Nielsen (2013:66) in their study on small and medium sized Danish manufacturing companies showed that acceptance of responsibility by top management, the establishment of a quality culture and communicating the vision and implementing the quality policy of the organisation contributes to quality improvement.

Leadership in the TQM context is the development of the mission, vision and values of the organisation. It's being a role model for a culture of excellence. Leaders also evaluate the needs and expectations of all stakeholders – internal and external customers. The key function is the ability to motivate, provide support, resource allocation and control (Singh, Geetika & Dubey, and 2011:532).

Leadership is described as a link through which one individual is expected to control the performance of others in the organisation and channel and control their conduct with the aim of attaining organisations set objectives (Ooi, 2009:636). Good results are attained by developing teamwork and formulating the right strategy, which is the function of Leaders. Leaders promote an enabling environment for employees, engage employees in strategic decisions and their knowledge in activities of the organisations which enhances organisational performance (DuBrin, 2013:7-8).

2.10.3 Effects of employee involvement and empowerment on organisational performance

According to Jones and Kato (2005:1-42), in their study “The effects of Employee Involvement of Firm Performance”, indicated evidence to support the contention that employee participatory involvement through teams has an impact. They argue that such discretionary efforts by employees improve enterprise performance. It was indicated in the study that teams solicited and directed by management performed much better than teams with volunteer members. Furthermore, educated and skilled teams enhanced performance. Mechanisms for employee involvement included working as teams, quality circles, information sharing and total quality management.

Employee involvement cannot be underestimated, as it motivates employees to be committed to the organisation (Chesoli, 2018:65-69). These authors indicate that allowing employees to be part of decision making increases job satisfaction and organisational growth. The study also makes mention of critics who highlighted that some firms involve employee for ethical and political reasons and not necessarily for enhancing performance.

Khattak, Iqbal and Khattak (2013) measured the relationship between employee involvement and organisational performance in a Pakistani organisation. Three components of employee involvement evaluated for this study includes employee empowerment, team orientation and capacity development. Organisational performance was measured through open interval model results, rational models results and human relations model results. The results of the study confirmed that organisational performance increases ranged from 56% to 94%, due to employee involvement. These components demonstrated strong and positive relationships with organisational performance (Khattak et. al, 2013:219-230).

Arshida and Agil (2013:254-259) investigate the critical success factors for TQM implementation in a Libyan Iron and Steel company in order to improve its performance and to identify impediments to the successful implementation of TQM. They discovered that employee empowerment, which is one of the factors for employee involvement must be considered when implementing TQM, as it has an impact in the success of the company. They define critical success factors as a limited number of areas which, will ensure successful competitive performance of an

organisation. They further mentioned that critical success factors are not universal, as researchers and scholars used different factors. They mentioned scholars like Ahire et al (1996) who identified and studied 12 factors and Saraph *et al.* (1989), who developed a reliable instrument to measure quality management practices based on eight (8) factors.

This study employed a framework similar to Sabella *et al.* (2014); Dean & Bowen (1994); Talib, Rahman & Qureshi (2010); Mehmood *et al.* (2014); Singh, Geetika & Dubey (2011) and many other similar studies that assessed employee involvement as empowerment of employees. These measures included appraisal systems, training, providing safety and health, training all employees in quality concepts and management involvement in employee's empowerment. These elements or performance indicators are relevant to employees working in laboratories.

2.10.4 Effects of employee involvement and quality improvement

Quality improvement, as defined by Hoyle (2018), is better control and raising of standards achieved by employee involvement. Quality improvement according to Inderlal (2013) and Prajogo and Sohal (2004) includes reduction of defective products, reduction of rework, conformance to specifications and reduction of non-conforming work. It can be better achieved by employees that are better trained, empowered, and better led, innovative, encouraged to give suggestions, objectively evaluated, rewarded and recognised.

Wilkinson and Marchington (1996:4-5) discuss the different views of quality gurus to illustrate the contributions of employee involvement. A view by Deming is that employees should be trained to spot defects and put measures in place to address the causes of defects, and must be offered rewards and challenging jobs. Feigenbaum, another guru, is quoted as saying that workers need a good understanding of what management is trying to do, and that quality improvement can be achieved by everyone's participation.

Inderlal (2013:114-115), reported that employee involvement had no significant influence on quality improvement and organisational performance. This is attributed to organisations surveyed providing little or no empowering of their employees, and not allowing employees to use their skills and knowledge. Inderlal's study contradicts

many non-empirical studies that all established a positive relationship between employee involvement and quality improvement (Yang, 2006; Dimba, 2010 and Ooi *et al.*, 2007).

Al-Damen (2017) in his study looked at teamwork, employee suggestions and commitment to determine how they affect performance. Abdallah (2013) in addition to elements studied by Al-Damen (2017), included team incentives and rewards as well as employee involvement in improving quality of products and processes.

2.10.5 The effects of customer focus on organisational performance

The goals and objectives of organisations are centred on customer needs and expectations. Customer satisfaction is essential to achieve superior performance, and organisations should identify the customer needs and expectations and ways to meet them (Abdallah, 2013:5). According to Mehmood, Qadeer and Ahmad (2014); Long *et al.* (2015); Sadikoglu and Olcay (2014); and Hackman and Wageman (1995), customer focus is one of the most frequently used TQM practices and is one of the major indicators of performance enhancement.

The studies that investigated the link between customer focus and organisation performance have concluded that there is a strong positive link between the two (Yaccob, 2014; Mohammadi, 2014; Mehmood, Qadeer & Ahmad, 2014; Sadikoglu & Olcay, 2013; Sabella *et al.*, 2013; Mohammed, Alharthi M.A, Alharthi D.K, Alhabashi, and Hasan, 2014; Jaafreh & Albedallat 2013; Fening, Amaria & Frempong 2013; Al-Damen, 2017; and Samson & Terziovski 1999).

The study by Mehmood, Qadeer and Ahmad (2014) found that customer focus has no significant impact of organisational performance and mentions other studies with similar findings. Prajogo and Sohal (2001) argue that highly customer focused organisations bear high costs and associated risks which have adverse effects on performance. These studies claim that focus on customer's leads to organisations being narrow minded which stops their ability to innovate, and that only employee involvement positively influences performance. Another study that indicates no positive relationship between customer focus and organisational performance is Inderlal (2013:113) which contradicts Cai (2009) and Maclayton (2006).

Jørgensen and Nielsen (2013:64-65) however, indicated that customer focus is the widely used TQM element, and supported by studies of the literature, they concluded that customer focus in fact exhibited a positive and significant effect on Organisational Performance. By focusing on customers, the organisation is able to achieve numerous objectives and targets. If all activities of any organisation are planned around customer needs and requirements this will ultimately lead to quality products and services.

Chepkech (2014:39) claims that customer focus is critical for organisational performance. It is argued in the study that organisations which make efforts to identify customer needs and establish communication and integration channels with its customers will eventually achieve their performance objectives.

2.10.6 The effects of customer focus on quality improvement

The customer is the most important part of the production line, and products and services have a customer every step of the way. To improve customer focus efforts, customer complaints should be treated as a top priority and an opportunity for improvement rather than as a nuisance. Customer satisfaction measures must be used to understand the factors that drive the market. All these will definitely lead to quality of products and services (Singh, Geetika & Dubey, and 2011:531).

Inderlal (2013:113) showed a significant and positive relationship between customer focus and quality improvement. The study mentioned many other studies that support the contention that a customer focus leads to quality products and services. Defects on goods produced by the organisation will not be acceptable to their customers. Many business lose customers mainly due to substandard goods and services. It is therefore argued in this study that focusing on customers results in better goods and cost saving.

2.11 Chapter summary

This chapter mainly focused on the conceptualisation of Total Quality Management, its history of use and how it started and how it has evolved. The chapter has discussed the contribution of Quality Gurus and the role they played in establishing TQM elements. The foregoing chapter also discussed the relationship between TQM and ISO Standards, and furthermore illustrated and defined various quality awards and how they are used to measure organisational performance.

The main reason for the abovementioned discussion was to establish a framework to determine the contribution of TQM to organisational performance. This was done by electing three elements of TQM that are widely used in research to formulate hypotheses for this study.

Then the chapter concluded by reviewing empirical studies that looked at the relationship and impact of Total Quality Management on Organisational Performance and Quality. All these studies examined the different elements of TQM, and most widely used was found to be customer focus, employee involvement and leadership.

3 Chapter 3: Case Study: - The Forensic Science Laboratory, Quality Management System and Performance management

3.1 Introduction

This chapter describes the SAPS, Forensic Services Laboratory (FSL) as the case study. The legislative framework governing police in South Africa is briefly explained. In addition the Criminal Procedure Act, is introduced and a brief explanation of its use by the FSL is given. This chapter concludes with the strategic and performance objectives of the FSL.

3.2 Legislative framework

3.2.1 Constitution of the Republic of South Africa

The South African Police Service (SAPS) derives its mandate from Chapter 11 section 205 of the Constitution of the Republic of South Africa, Act (108 of 1996) that stipulates the responsibility and objectives of SAPS as –

- prevent, combat and investigate crime;
- maintain public order;
- protect and secure the inhabitants of the Republic and their property;
- uphold and enforce the law;
- create a safe and secure environment for all people in South Africa;
- prevent anything that may threaten the safety or security of any community;
- investigate any crimes which threaten the safety or security of any community;
- to ensure that criminals are brought to justice; and
- to participate in the efforts to address the causes of crime.

(SAPS: Annual Performance Plan 2018/2019)

3.2.2 South African Police Act

Section 205 (2) of the Constitution of the Republic of South Africa instructs the National Legislature to establish the powers and functions of the police service and ensure that the police are able to discharge their responsibilities effectively. Such national legislation must be applicable to provinces of the Republic of South Africa.

As a result, the South African Police Service Act, 68 of 1995 was established. The main aim of this legislation was to provide for the establishment, organisation, regulation and control of the police service.

3.2.3 Criminal Procedure Act (CPA)

The aim purpose of the Criminal Procedure Act, 51 of 1977 was to make provision for the procedures and any related matters in criminal proceedings (Criminal Procedure Act, 51 of 1997).

Chapter 24 of the CPA, sections 208-253, makes provision for procedures and requirements regarding evidence in criminal matters. Section 212 of the CPA makes provision for Forensic Science Laboratory personnel such as the Forensic Analysts, to make statements in the form of affidavits or certificates. These prove facts established by making use of skills or processes as mentioned in subsection 4(a) of the CPA during the execution of official duties when any examination or process as stated in subsection 4 (a) was used to analyse or examine forensic evidence.

3.3 SAPS objectives

In order to achieve its vision of creating a safe and secure environment for all people in South Africa, and to fulfil the Constitutional mandate, SAPS has established and arranged its role and responsibilities into five departmental programmes. These are (P1) Administration; (P2) Visible Policing; (P3) Detective Services; (P4) Crime Intelligence and (P5) Protection and Security Services which are informed by the objectives of policing as stated in the Constitution. Each of these programmes is divided into sub-programmes which collectively address the programme purpose and objectives (SAPS Strategic Plan, 2018-2019).

3.4 Forensic Science Laboratory

The Forensic Science Laboratory (FSL) is one of the sub-programmes of departmental programme 3, Detective Services, and is an indispensable investigative aid in the investigation and detection of crime. The FSL is a highly regulated environment, which requires compliance with legislative prescripts, focusing on a number of key legislations. The services of the FSL include providing information to investigating officers, police detectives which is key to the successful investigation of crime, to ensure that offenders are brought to justice. This information is provided in a number

of ways and must be reliable and accurate. To achieve this, the FSL is progressively accrediting and certifying its methods and procedures, through implementation of the Quality Management System.

3.5 Management and organisation

3.5.1 Organisational structure

The purpose and objectives of departmental programme 3: Detective Services, is divided into two parts. The first is investigative work, while the second supports the investigative work in terms of forensic evidence and criminal records.

The first purpose –investigative work- is performed by Detectives. The second purpose – forensic and criminal records- is performed under Forensic Services (FS).

Forensic Services plays a critical role towards the realisation of SAPS' strategic objectives, by contributing to the successful prosecution of crime. It is one of the many Divisions of SAPS, and has structured its service delivery into three operational environments. These include the Forensic Science Laboratory (FSL), Criminal and Crime Scene Management (CR&CSM) and Quality Management (QM). CR&CSM focuses on crime scene processing, forensic evidence collection, as well as the storage and maintenance of criminal records. The FSL on the other hand is responsible for processing of the forensic evidence and providing result thereof. QM focuses on the establishment of quality assurance and quality control principles and improving business performance (SAPS Annual Report, 2013/2014). The Division FS is led by the Divisional Commissioner at a level of Lieutenant General, and each component, CRCSM, FSL and QM is led by the Component Head, at the level of Major General.

3.5.2 FSL management committee

FSL applies scientific techniques to analyse and examine many types of physical evidence in order to provide information which aids investigators in criminal investigations. The complexity in the analysis of physical evidence requires an application of a number of scientific techniques and different expertise and skills. This has resulted in the grouping of expertise, technique and skills into six business units. Each business unit, also referred to as Sections, is led by a Section Head at the level

of Brigadier, to apply specific techniques to specific evidence which differs from Section to Section.

3.6 Vision, mission and customers of FSL

The Vision of the FSL is to become the world leader in forensic services. Its mission is to scientifically interpret all clues/ or physical evidence optimally in order to deliver impartial, expert findings in criminal cases, thereby ensuring that justice is served (SAPS: Forensic Science Manual,2012:9).

The FSL has established and implemented a quality management system based on international standards. Its aim is to provide the general public, SAPS and other users of its services with the assurance of integrity and reliability in the examination of evidence, and ensure that such is presented at the required time frames and fit for purpose.

The primary clients/customers of the FSL are the Investigation officers- SAPS Detectives, while the courts of law are the secondary customers. The community and other government departments make up the third customer level.

3.7 Leadership

The leadership of FSL, comprises the Head, and each of the six Sections is led by a Section Head. The Head who is at the police rank of Major General reports to the Divisional Commissioner with a rank of Lieutenant General. Each Section head is supported by Section Commanders at a rank of Colonel.

3.8 Customers focus

In the quest to improve customer focus, the SAPS FSL has responded by establishing three main platforms for interacting with its customers, the forensic fact files, forensic awareness and forensic conference.

3.8.1 Forensic Fact-Files

The “Forensic Fact files” are information documents on a specific topic of interest in the field of forensic science and provide information on services performed by the different Sections of FSL. These documents which are posted on the SAPS intranet are accessible to all SAPS intranet users, but specifically target investigating officers

and crime scene investigators. The Forensic Fact File can be either be printed to make them accessible to members with no immediate access to the intranet or kept on file for reference. The documents are referenced with a unique number for identification and indexing.

The information communicated on these documents can be used for training customers, and provides standard operating procedures for handling, preserving, storage, transportation and identification of forensic evidence. The aim of the fact files is to equip users with knowledge and information to improve laboratory performance.

3.8.2 Forensic awareness

The Forensic awareness programs are an interactive communication tool between FSL and its customers. These interventions entail visiting the crime scene, investigators and Detectives, the primary customers of FSL as well as the courts and community members.

The intervention can be through formal training, where competency is declared to attendants or as a workshop. These interventions create an enabling environment for discussions and close interaction with customers. Customers are afforded an opportunity to make inputs to FSL processes, complaints or compliments about the laboratory.

3.8.3 Forensic conference

SAPS Forensic Services hosts National Conferences, where national and international delegates from law enforcement agencies and forensic services communities including other government departments and private institutions that have an interest in forensic services gather to share information and expertise.

These conferences provide an opportunity for delegates to discuss different forensic topics and break barriers among different role players in the forensic science field. They also focus on forensic awareness of legislation and showcasing forensic capabilities. The accumulation of knowledge and awareness of forensic investigative capabilities at these conferences is invaluable for increasing the value and benefits that forensic services provide to customers. The conference also provides a platform for FSL to showcase its services and share expertise with peers and customers.

3.9 Service area

The SAPS Forensic Science Laboratory is a national laboratory which uses scientific principles, techniques and methods to process physical evidence in crime investigations. The Forensic Science Laboratory's head office is situated in Gauteng Province, Silverton Pretoria. The main building in Silverton houses three of the six Sections and due to the Silverton building not able to accommodate all the Sections, the other three Sections are stationed in Hatfield, Arcadia and Pretoria Central. In addition to the main laboratory in Pretoria, decentralised laboratories are established in Cape Town, Port Elizabeth and Durban.

The physical evidence processed at the FSL is delivered to the laboratory by crime scene investigators and investigating officers, the Detectives. The outcome of the processing of physical evidence is in the form of a forensic test report, and is used in criminal proceedings and court proceedings. The forensic test reports are compiled in terms of section 212 of the Criminal Procedure Act (CPA), and in terms of this legislation, forensic test reports that comply with the requirements of section 212 of CPA, are prima facie evidence. However such evidence is not exempted from being challenged in court, in the form of cross examining the author of the test reports, which in this case are FSL employees.

3.10 Organisational performance and strategic framework

The six Sections which include Ballistics, Biology, Chemistry, Questioned Documents, Scientific Analysis and Victim Identification Centre perform their duties by processing different types of forensic exhibits using scientific techniques and provide test reports to their customers.

3.10.1 Forensic Science Laboratory performance

Performance is measured from the date the case-exhibit is received and registered at FSL for examination/analysis, to the date that case-exhibit is finalised. Finalised means, analysis or examination completed with test results and test report.

The case-exhibits are categorised according to their nature as routine and non-routine. Routine case-exhibits are those that have one or more of the following characteristics, less complicated, quantity manageable, having readily available

analysis techniques and regularly analysed. Non-routine case-exhibits on the other hand are those with one or more of the following characteristics, complex, quantity not manageable, method not readily available, may require extensive research, and not regularly analysed.

The performance targets for the two case-exhibits categories are not the same. The desired performance is the number (agreed percentage) of case-exhibits finalised within the agreed timeframe. The desired number of case-exhibits finalised, and the timeframe for routine is not the same as for non-routine case-exhibits. A larger number of routine case-exhibits is expected to be finalised within a shorter timeframe compared to the non-routine, which are fewer in number, and have longer timeframes.

The third category of case-exhibits are those resulting from performance targets not being achieved for both routine and non-routine case exhibits. It includes both routine and non-routine case exhibits remaining unprocessed. These case-exhibits are referred to as backlog case-exhibits, and are to be kept to a minimum and reduced. The forensic requests/ case-exhibits are forwarded to the FSL for forensic processing by investigating officers and crime scene experts in accordance with the agreed protocol.

3.10.2 Strategic objectives and organisational performance

The strategic objectives of FSL as one of the sub programmes of departmental programme three (3) of SAPS is to contribute to the successful prosecution of offenders by analysing forensic evidence, achieved by enhancing the processing of forensic case-exhibits.

The SAPS, Annual Performance Plan (APP) (2018/19) identifies the predetermined objectives and targets that SAPS intends to achieve each year. The strategic objectives and annual targets are outlined for each of the five departmental programmes in the APP. Reporting on financial and non-financial performance is key in measuring the performance of any organisation. Financial information –budgets and expenditure- is critical for the determination of the financial efficiencies of a programme, whilst non-financial information –performance information- is key in determining the whether the predetermined targets and objectives of each programme are achieved.

The Department of Planning Monitoring and Evaluation (DPME) is responsible for the facilitation, influencing and supporting of the effective planning, monitoring and evaluation of government departments. The aim of this is to improve performance leading to improved service delivery. The DPME assists government departments to develop Technical Indicator Descriptions (TID) for each performance indicator described in the APP. The TID describes the definition and purpose of each indicator, including the collection, calculation and interpretation of performance data. It indicates the systems to that can be used by government departments to generate performance information and to report organisational performance indicators. The document provides information that aim to promote the understanding on the procedures that must be followed to record performance data, how to collect, collate, verify and report on the actual performance on predetermined performance objective as outlined in the SAPS Annual Performance Plan. Finally, it indicates the responsibilities at all organisational levels (SAPS: Technical Indicator Description, 2018/19)

In the case of SAPS, organisational performance is achieved through alignment of organisational performance and individual performance. This process is cascaded down to departmental programmes. The organisational performance is outlined on the annual performance plan which is aligned to Senior Management performance agreements (salary levels 13-16) and the Performance Enhancement Process (PEP) (salary levels 1-12). All five departmental programmes are expected to craft annual performance plans that set out targets and objectives. Performance targets are set out with the assistance of the DPME by sub –programmes whereby performance indicators are outlined.

3.10.3 Linking Goals and Plans

Organisational goals and plans are closely related. Goals are the desired ends and plans are means to bring about those ends (Bartol & Martin, 1998:203-204). There are typically three types of plans, strategic, tactical and operational plans. This study focus on the third type, the operational plan, which is outlined in annual performance plans as indicated earlier.

Managers of organisations must understand how goals can facilitate performance and the critical element in using goals effectively is getting individuals and teams to be committed to the goals they must carry out. A suitable management system that allows

and enables systems to be in place to attain goals must be supported by all in the organisation.

3.11 Chapter summary

The foregoing chapter introduced the legislative framework, whereby the Constitutional mandate of the South African Police Service was explained including the objective of the service. In addition the legislation was described which governs the SAPS, the SAPS Act 68 of 1955, and its relation with section 205 of the Constitution of the Republic of South Africa. The main product of the Forensic Science Laboratory, is a forensic report after analysis of forensic evidence is complete. This chapter explained the Criminal Procedure Act, the law that makes provision for this product, and the statement by forensic analysts in form of affidavit or certificate. The chapter concluded with the strategic and performance objectives of the FSL.

4 CHAPTER 4: Research design and Methodology

4.1 Introduction

This chapter outlines and presents the research design and research methodology used for this study. It describes the research instrument, sampling plan, data collection and data analysis method employed and the methods used to achieve a high level of reliability and validity. The research process is also outlined in this chapter.

4.2 Research design

The research design can be defined as a plan or protocol on how research is to be conducted, as it provides a strategic framework for the collection and analysis of data. It provides guidance to ensure that research activities lead to sound conclusions (Terre Blanche, Durrheim & Painter, 2006:34-36; Bryman, 2012:46). The research design forms part of the planning stages of the research process. It precedes the execution stages of data collection and data analysis and is based on the research question. Although it occurs at the beginning of the research process, it is influenced by all the stages of the research process (Babbie & Mouton, 2017:97).

Research designs vary depending on the purpose of the research, the questions to be answered and the methodology of the study (Durrheim, 2006:36). A choice of what research design the researcher would employ, is dependent on the dimensions of the research design. According Durrheim (2006:37), a decision on the research design must be based on four dimensions: the purpose of the research; the theoretical paradigm; the data collection and data analysis techniques; and situation or context within which the research is carried out. If these are woven together in an coherent design, the validity of the research findings will be maximised.

4.3 Research approach and strategy

This study adopted a quantitative research approach, employed surveys and interviews as a research strategy for collecting data, and used questionnaires and structured interview questions respectively as research techniques. The choice of the research approach for this study was to objectively evaluate the data to test the hypotheses formulated from the theory on Total Quality Management practices.

According to Bryman (2012:19) and Morgan (2013:50), the researcher deduces hypotheses that are subjected to empirical scrutiny through a quantitative research

approach. The goal of linking causes to effects, which was the aim of this study, can be associated with the deductive process. However, the inductive process, where theory is derived from data, has theory generation as its goal, and not theory testing. It is associated with exploratory studies and follows a qualitative approach (Bryman 2012:26 and Morgan 2013:48).

Quantitative research puts emphasis on quantification in the data collection and analysis processes. It entails a deductive approach, incorporation of a positivist research philosophy embracing objectivism. It expresses the element of generality that provides a research question in terms of variables which act as elements in an abstract model (Bryman, 2012: 35-36).

Qualitative research on the other hand, places emphasis on words in the collection and analysis of data (Bryman, 2012:36). The collection, analysis and interpretation of data can happen at same time, and the researcher is likely to alter methods and techniques during the research process (Neuman, 2006:15). The research design for qualitative, inductive and subjective or construct research is flexible and can be altered during the research process, whereas the quantitative research design is predetermined and explicit, therefore objective (Morgan, 2013:49).

4.4 Rationale for the chosen research design and research approach

The goal of this study was to link cause and effects by evaluating the objective data collected by use of questionnaires administered to employees of the FSL and its customers. The appropriate research approach and strategy that would maximise the validity of the research findings, as supported by Durrheim (2006) and Morgan (2013) was a quantitative research approach. This empirically tested the three hypotheses for this study, to answer the question as to whether TQM practices have an effect on quality performance and organisational performance.

The research design choice for this study was influenced by the researcher's knowledge and understanding of Total Quality Management and its application, thereby deducing hypotheses that could be subjected to empirical scrutiny. The other factors that influenced the research design choice, were researcher's role in the Forensic Science laboratory, the unit of analysis of the study. The researcher's emphasis on objectivity was supported by Bryman (2012:32).

4.5 Data collection

This study used primary data to test the stated hypotheses and to achieve its aim. There are also various methods of collecting data. This study used survey data, since this is the best method available for the collection of original data in the same format from a number of respondents (Babbie & Mouton, 2017:230,232; Neuman, 2006: 272; Saunders, Lewis & Thornhill, 2009:280).

4.6 Primary data

A structured questionnaire is used to collect primary data in order to determine the extent to which respondents hold a particular attitude or perspective (Babbie & Mouton, 2017:233). The respondents for this study were employees of FSL. They included forensic analysts from the rank of warrant officer to the rank of Brigadier.

Primary data, also referred to as raw data or first-hand data, have an advantage because they are generated specifically for a particular purpose, are original in nature and are relevant to the research topic. The data collection tools and techniques are designed to suit the study. These types of data are much more effective because they are gathered specifically to address an issue at hand or are collected to address specific problem, however they have the disadvantage because they are time consuming and expensive.

4.7 Data collection method

The data collection instrument for this study was a self-completion questionnaire, completed by respondents. The absence of any interaction between the respondents and researcher, dictated the types of questions asked on the questionnaires. According to Neuman (2006:287), there are two types of questions that can be asked in a questionnaire. These are either open-ended or closed ended questions; open-ended questions are unstructured free response questions, while closed-ended questions are structured with fixed responses.

This study used a questionnaire consisting of closed-ended questions. The reason for opting for closed-ended question as supported by Neuman (2006:288) and Bryman (2012:249) was that closed questions are quicker and easier to process for both the respondent and researcher in large scale surveys. Furthermore closed-ended items enhance the comparability of answers and allow for easy coding. This is because,

these questions, can be transferred directly into a computer format, unlike open-ended questions, which have to be coded before computation (Babbie & Mouton, 2017:233).

4.8 Constructing questionnaires

The questionnaire for this study consisted of five sections; Section A was biographical information, that sought to establish where the respondent was employed, the number of years at FSL and rank or level in the organisation; Section B sought to establish the perception of employees regarding top management or FSL leadership commitment to quality activities, eight TQM leadership dimensions were structured into statements that required a response on a Likert scale; Section C determined the extent of employee involvement in activities and processes of the FSL, eight statements sought to determine whether employees inputs are considered, whether employee are trained and empowered to take decision, bearing in mind the culture in the police; Section D sought to establish the role of customers in shaping the processes of the organisation, whether customer complaints management was in place and adequate, eight statements were used to get information from respondents; Section E was designed to measure the quality of systems in FSL, with five statements that assessed the quality of products, services, processes and resources; finally Section F sought to establish whether performance objectives were attained.

The questionnaire utilised a seven point Likert scale which investigated attitudes and perceptions of respondents on total quality management practices and organisational performance. Bryman (2012:165-166) stated that the approach to investigate clusters of attitudes is known as a Likert scale, and that researchers usually use five-point rather a seven point-scale.

The Likert scale, whether a five-point or seven-point scale, is essentially a multiple indicator or multiple-item measure of a set of attitudes relating to a particular area. It is named after its developer Rensis Likert. Its goal is to measure the intensity of feelings about the area in question. It comprises a series of statements, not questions that focus on a certain issue (Bryman, 2012:166).

4.9 Population and sampling

In Bryman (2012:187), population is defined as the universe of units from which the sample is to be selected. Durrheim and Painter (2006:133), define, population as a

larger pool from which sampling elements are drawn, and from which the researcher wants to generalise findings. According to Neuman (2006:224), a population is the larger group of many cases from which a researcher draws a sample and to which results from a sample are generalised.

The population for this study was employees of the South African Police Service, Forensic Science Laboratory stationed in Silverton and General Piet Joubert Buildings. The researcher used convenience sampling by distributing questionnaires to any Forensic Analyst available and willing to participate on the day of the visits to Silverton Building and General Piet Joubert Building where the researcher is stationed.

At first, two questionnaires were constructed, one for detectives and the other for FSL employees stationed at the two buildings. The questionnaires for detectives were placed at reception areas of the two buildings for distribution to any detective visiting the two buildings

Keeping in mind the weaknesses of the convenience sampling technique, the one technique initially employed was supported by Babbie and Mouton (2017:166); Taherhost (2016:23); and Bryman (2012:201). The researcher then employed a purposive sampling technique by visit a few police stations in Pretoria and Johannesburg, by randomly selecting detective stations in close vicinity of the two buildings, Silverton, Sunnyside and Brooklyn Police stations and police stations in Johannesburg where ten questionnaires were distributed to only the detectives for each police station visited.

Only one police station out of all those visited completed and returned all ten questionnaires. The researcher was therefore left with no option but to narrow the study to only FSL employees.

4.10 Chapter summary

This chapter focused on the research design, research approach and strategy. Also indicated was how the questionnaires for this study were constructed, why this study was undertaken, how data was collected. The chapter further described the study population and sample as well as the sampling technique. In addition the areas where the study was conducted and the respondents were identified.

5 Chapter 5: Data presentation and analysis

5.1 Introduction

The following chapter presents analyses of data and discussion of the findings. The data was collected by means of questionnaires directed to customers and employees of the Forensic Science Laboratory in Pretoria.

5.2 Data analysis

The section below illustrates and provides the analysis of data through questionnaires randomly distributed to FSL employees in Silverton and General Piet Joubert Building. As indicated earlier, Silverton houses three of the six Sections and General Piet Joubert Building accommodates one Section.

The eight dimensions of TQM Leadership, whereby management commitment to quality is measured is illustrated fig 5.1. A seven point Likert scale was used in the questionnaire. This was selected because the questions were not straight forward, and required skill to understand the intentions of the researcher. Responses will now be discussed in the sections to follow.

5.3 Questionnaire to FSL employees

5.3.1 Background

The eight dimensions, as identified in Chapter 2, were used to assess Leadership or Top management commitment to quality. These dimensions form part of a questionnaire divided into different sections. Section A is the Biographical information of respondents, Section B is dimensions of Leadership, Section C, is Employee management, Section D, Customer Focus, Section E, is Quality Improvement and lastly Section F, is Organisational Performance.

5.3.2 Perception of employees on leadership commitment

Figure 3 illustrates the responses of employees to the eight dimensions of TQM leadership commitment irrespective of rank and responsibilities. The questions were drafted in such a way that the respondents could easily relate by using terms and phrases they were familiar with.



Figure 9: Section B: Responses on leadership

The purpose of statement number B1 in section B labelled B1 was to determine whether management do communicate goals of the organisation. This is important in the context of TQM, as it provides insight as to whether performance goals are communicated to all employees to enable them to align their performance with that of the organisation. The responses illustrate that 32 out of 46 (69.57%) employees agreed to management communicating, varying from completely agree to somewhat agree and then 1 out of 46 (2.18%) were uncertain and 13 out of 46 (28.27%) disagreed.

Statement number B2 asked whether employees are made aware of non-performance, which is important in the context of TQM, to enable employees to identify reasons for non-performance and devise corrective actions. The responses illustrate that a high percentage, 41 of 46 (89.13%) agree, 2 out of 46 (4.34 %) are uncertain and 3 of the 46 (6.52%) disagree.

The purpose of statement number B3 is to determine whether managers involve employees in setting performance goals.. This is important in the context of TQM, since it advocates total or organisation wide involvement in decision making. The responses illustrate that 20 of the 46 (43.48 %) of respondents agreed, 2 of the 46 (4.34%) were uncertain and moderate number 24 of the 46 (52.18%) disagreed with the statement. This indicates that management dictates to members what performance should be.

The purpose of statement B4 was to identify whether resources that enable performance goals to be attained are adequate. The responses indicate that 36 out of 46 (78.27%) agree, 2 of the 46 (4.34%) are uncertain and 8 of the 46 responses (17.31%) disagree. Resources are key to performance and if inadequate, then performance will be affected.

The purpose of statement B5 is to determine whether employees are motivated to achieve satisfactory performance, which is important in the TQM context. Managers must identify means other than monetary to motivate the employees to perform. The responses illustrate that 32 out of 46 respondents (69.57%) agree, 3 of 46 (6.52 %) are uncertain and 11 out the 46 respondents (23.91%) disagreed.

The purpose of statement B6 was to determine whether management encourages employees to participate in decision making. In the context of TQM a bottom up approach to decision making is key, since it allows employees to own and support decisions at the Laboratory. The responses indicate that only 11 out of 46 (23.91 %) of respondents agreed, 4 of the 46 (8.69 %) were uncertain and 31 out of 46 (67.40%) disagreed. This indicates that managers do not consult with employees when making decisions.

The purpose of statement B7 is to determine whether managers inform employees about customer needs. In the context of TQM and quality management, fulfilment of customer needs takes number one priority. The responses illustrate that 40 out of 46 (86.96%) agreed that managers keep employees informed, 5 out of 46 (10.87%) were uncertain and a mere 1 out of 46 (2.18%), disagreed.

The purpose of statement B8, was to assess the level of management involvement in quality activities, which is important in the TQM context and other management system, in that managers must lead by example, and their buy in and evidence of involvement improves performance. The responses indicate that 33 out of 46 (71.75%) of the respondents agree, 2 out of 46 (4.34%) were uncertain and 11 out of 46 (23.91%) disagreed.

5.3.3 Employee involvement: Perception of employees on employee involvement

For Employee Involvement also referred to as Employee Management, eight dimensions were identified from literature reviewed in Chapter 2 were included in the questionnaire distributed to randomly selected employees.

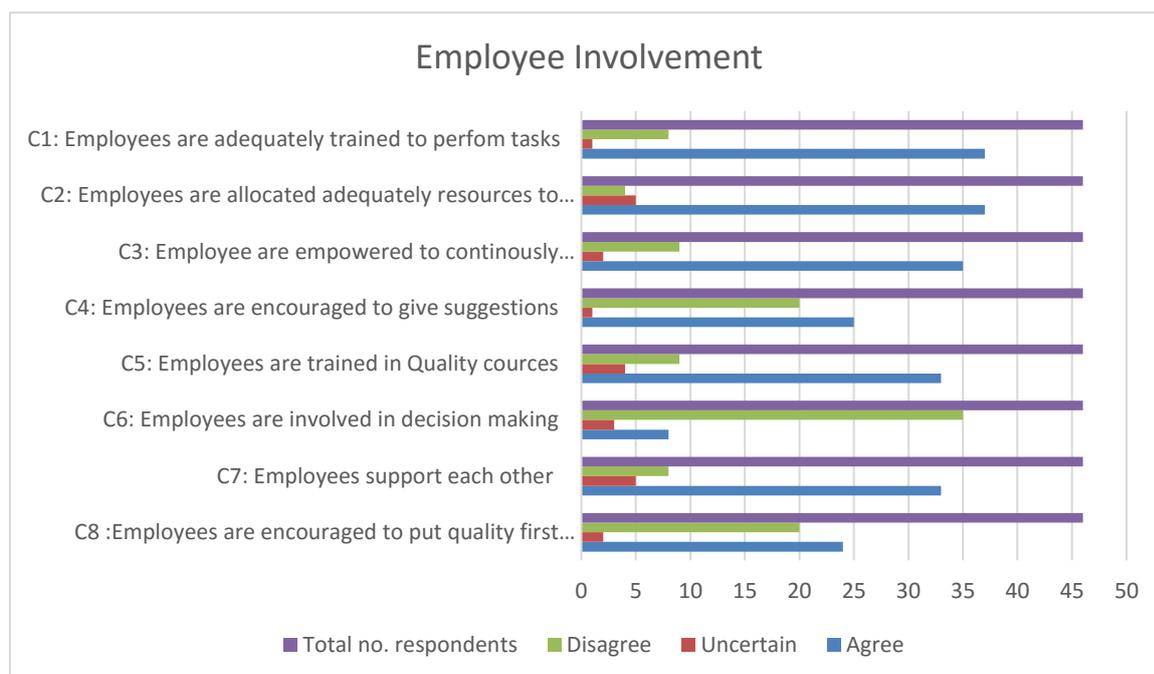


Figure 10: Section C: Responses on employee improvement

The purpose of statement number C1 was to assess training. This is important in the TQM context, because to enable performance, employees must be adequately trained. At the Forensic Science Laboratory before any Laboratory Analysts perform any laboratory work, they must have undergone all required training and be declared competent. The responses illustrate that 37 out of 46 (80.43%) of respondents agree, 1 out of 46 (2.18%) was uncertain and 8 out of 46 (17.31%) disagreed.

The purpose of statement number C2 is to determine whether employees are allocated resources to perform their duties. Thirty seven out of 46 (80.43%) of responses indicate that employees are adequately resourced, 5 out of 46 (10.87%) are uncertain and 4 out of 46 (8.89%) think that resources to employees are inadequate.

The purpose of statement C3 was to understand the respondent's perceptions of whether employees are empowered to improve performance. In the context of TQM

over and above training, employees must be empowered to make decisions regarding their work and have to have authority. The responses indicate that 35 out of 46 (76.09%) of respondents agree, 2 out of 46 (4.34%) are uncertain and 9 of the 46 (19.57%) disagreed.

The purpose of statement C4 was to determine whether employees are encouraged and allowed to give inputs and suggestions to laboratory activities and processes. This is important in the TQM context, as it allows employees to design or assist development activities in the Laboratory. The responses indicate that 25 out of 46 (54.34%) agree that the opportunity for inputs and suggestions is provided, 1 out of 46 (2.18%) is uncertain and 20 out of 46 (43.48%) disagree, indicating that they are not part of designing and developing Laboratory processes.

Statement number C5 determined whether employees are trained specifically in quality courses. This is important, as everyone, and not only quality personnel must know and understand the quality management process. The responses indicate that 33 out of 46 (71.75%) of respondents think that employees are afforded the opportunity to undergo training in quality management, 4 out of 46 (8.89%) are not certain, and 9 out of 46 (19.57%) disagreed.

The purpose of statement number (C6) was to determine whether employees are involved in decision making. This question is different from management actions, in allowing employees to be part of decision making, this assessed whether the system allows and not whether individual managers provide that opportunity. The responses indicate that the system does not allow employees to be part of decision making, as only 8 out of 46 (17.31%) agree, 3 out of 46 (6.5%) are uncertain and 35 out of 46 (76.09%) indicate that systems in the laboratory do not allow employees to be part of decision making.

The purpose of statement C7 was to check whether there is team work and that employees support each other. In the context of TQM, team work is important, because people have different strengths and weakness and by working together and supporting each other, obstacles to performance can be eliminated. The responses indicate that 33 out of 46 (71.75%) agree that there is team work in the Laboratory, 5 out of 46 (10.87%) are uncertain and 8 out of 46 (17.31%) disagreed with the statement that members support each other.

The purpose of statement C8 was to determine whether quality is prioritised over quantity. The responses illustrate that just over 50%, 24 out of 46 (52.18%) agree that quality is placed higher than quantity, 2 out of 46 (4.34%) are uncertain, and just below half of the respondents, 20 out of 46 (43.48%) disagree, indicating that quantity is taking a higher priority than quality.

5.3.4 Customer focus: Perception of customer focus

Eight Dimensions as identified in literature review, Chapter 2 were included in the research questionnaires to assess customer focus.

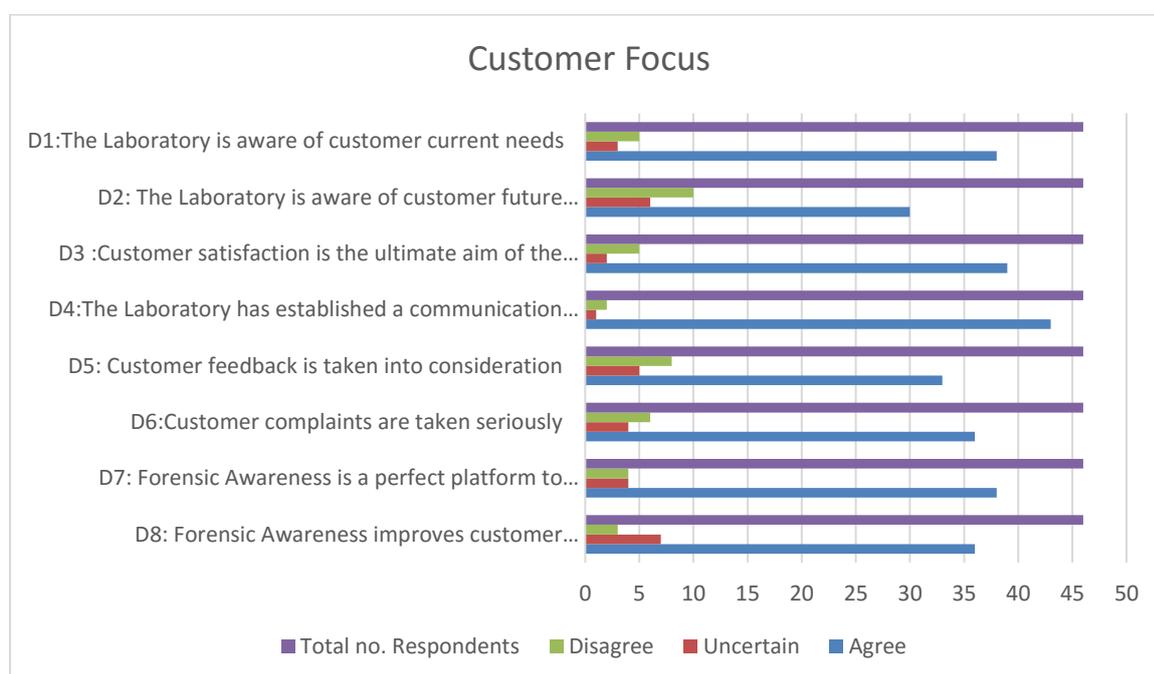


Figure 11: Section D: Responses on customer focus

The purpose of statement D1 was to determine whether the Laboratory is aware of what its customers currently expect. In this context, the activities of the Laboratory must be centered on what customers need and expect; fulfilment of customer needs and expectation is key in quality management. The responses indicate that 38 out of 46 (82.60%) of respondents agree that the Laboratory is aware of customers' current expectations, 3 of the 46 (6.52%) don't know, and 5 out of 46 (10.87%) disagreed.

The purpose of statement D2 was to determine whether the Laboratory can forecast future needs and expectations of customer. In this context the Laboratory is expected to be a step ahead of criminals, and provide advice and guidance to its customers. The responses indicate that 30 out of 46 (65.21%) of respondents agree that FSL is

far ahead, 6 out of 46 (13.04%) don't know, and 10 out of 46 (21.74%) think the Laboratory will be found wanting in future.

The purpose of statement D3 was to determine whether the Laboratory takes their customers seriously. In the TQM context, all activities in the Laboratory must be centered on customers. The responses illustrate that 39 out of 46 (84.79%) of respondents agree with the statement, 2 out of 46 (4.34) uncertain and 5 out of 46 (10.87%) disagreed.

The purpose of statement D4 was to determine whether employees are aware that communication channels with customers is available. In TQM context, to enable the Laboratory to know and understand the needs and expectation of its customers, communication and interaction with customers is important. The responses, 43 out 46 (93.48%) agree and is aware of the communication channels, 1 out 46 (2.18%) don't know, and a mere 2 out of 46 (4.34) disagreed with the statement.

The purpose of statement D5 was to determine whether inputs from customers are considered. In this context, TQM advocates that customer shape the direction the organisation is taking. In the laboratory customer request dictates how the samples are tested and how system are developed. The responses indicate, 33 out of 46 (71.75%) agree that feedback from customers is considered, 5 of the 46 (10.87%), is not aware, and 8 out of 46 (17.31%) disagreed.

The purpose of statement D6 was to check whether customer complaints are addressed. This is important for increasing customer confidence in Laboratory work. The responses indicate 36 of 46 (78.27%) agree with the statement that customer complaints are effectively managed, 4 of 46 (8.89%) are uncertain and 6 of 46 (13.04%) disagreed.

The purpose of statement D7 was to evaluate whether Forensic Awareness workshops are effectively communicating and understanding customer needs and expectations. The responses indicate 38 of 46 (82.60%) respondents agree that the workshops are a perfect platform for identifying needs and expectations, 4 of 46 (8.89%) uncertainty and 4 of 46 (8.89%) disagreed with the effectiveness of the workshops.

The purpose of statement D8 was to evaluate the impact of Forensic Awareness workshops in improving relationship between the Laboratory and its customers. The responses indicate 36 of 46 (78.27%) agree, 7 of 46 (15.21%) are uncertain, and 3 of 46 (6.52%) disagreed.

5.3.5 Quality improvement: Perception of respondents to quality improvement

Five Dimensions as identified in literature review, Chapter 2 were included in the questionnaire as section E of the questionnaire distributed to randomly selected employees.

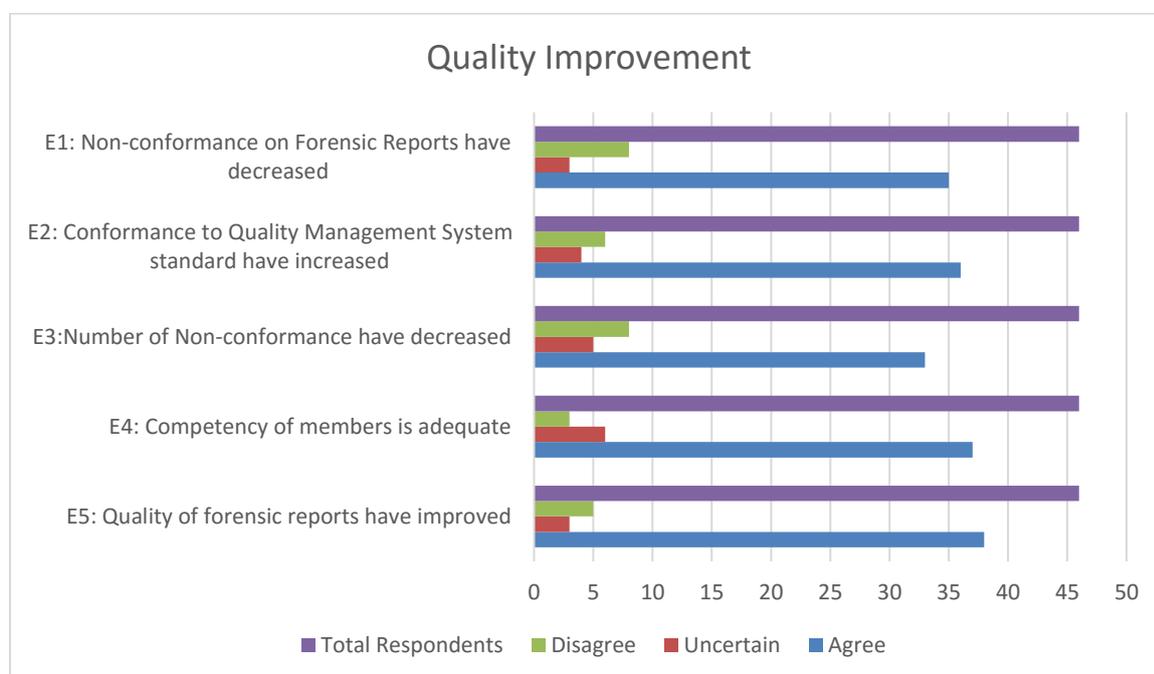


Figure 12: Section E: Responses on quality improvement

The purpose of statement E1 was to determine whether defects on the final product – the forensic test report- are at insignificant level. In the context of Laboratory work, there are warranties for defects. Once defects are identified in court, reputational damage and discrediting of the Laboratory can take place. If errors are undetected, innocent persons can be wrongfully convicted, or the guilty can be freed. This cannot be tolerated. The responses indicate that 35 of 46 (76.09%) think the number of non-conformances in test reports have decreased or are insignificant, 3 of 46 (6.52%) don't know, and 8 of 46 (17.31%) think there is not improvement.

The purpose of statement E2, was to determine whether the gap between international standards on Quality Management System and Laboratory work have narrowed down. This is important, as conformance to international standards provide assurance of the quality of the product and services. The responses indicate 36 of 46 (78.27%), think the gap has narrowed down, 4 of 46 (8.89%) don't know, and 6 of 46 (13.04%) see no improvement.

The purpose of statement E3, was to determine whether the overall number of non-conformances are going down. This TQM illustrates whether time consuming rework and re-testing of samples has decreased. The responses illustrate that 33 of 46 (71.73%) agree that this time and resource consuming practice is at minimal, 5 of 46 (10.87%) are uncertain, and 8 of 46 (17.31%) disagreed.

The purpose of statement E4 is to understand the employee's perception of competency of Laboratory Staff. This is important as a determinant for Laboratory capacity to deliver on the mandate and improve performance. The responses illustrates that 37 out of 46 (80.43%) agree that the Laboratory is capable of performing and delivering on its mandate, 6 out of 46 (13.04%) don't know, and 3 out of 46 (10.87%) doubt the capability of the Laboratory.

The purpose of E5 was to determine whether there is continual improvement. This is important in the TQM context and for the Laboratory, as advances in technology and the dynamics of Laboratory environment require continual improvements. The forensic test report as a final product of the Laboratory is a good indicator of improvement. The responses indicate that 38 of the 46 (82.60%) agree that the Laboratory product is constantly and continuously improving, 3 of the 46 (6.52%), are uncertain and 5 of the 46 (10.87%) disagreed.

5.3.6 Organisational performance: Perception of employees on organisational performance

For Organisational performance five dimensions as identified in literature review were included as Chapter F of the questionnaire.

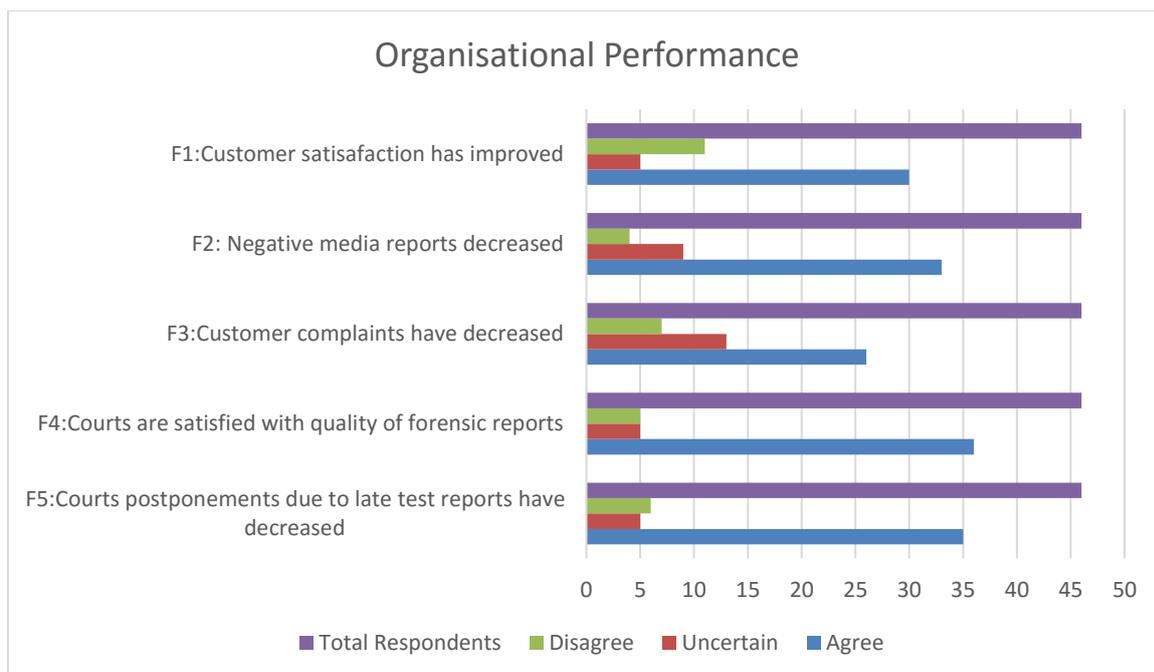


Figure 13: Section F: Responses on organisational performance

The purpose of statement F1 was to understand the perceptions of employees on the level of customer satisfaction. In this context, customers' satisfaction determine success. The responses illustrate that 30 out of 46 (65.21%) of respondent are of the view that the Laboratory is doing well in terms of satisfying its customers, 5 out of 46 (10.87%) are uncertain, and 11 of the 46 (23.91%) disagreed.

The purpose of statement F2 was to understand the perceptions of employees about the image and reputation of the Laboratory as portrait by media. In this context critics are important for feedback, and in most instances, media plays that role of reporting non-performance or when things are not well. The responses illustrate that 33 out of 46 (71.73%) think that negative media reports are at an all-time low or non-existent, 9 out of 46 (19.57%), are uncertain, and 4 of 46 (8.60%) disagreed, and think that negative media reports are high.

The purpose of statement F3 was to evaluate the level of customer complaints. In this context, when customer complaints are low it is an indication that the Laboratory is doing well. The responses illustrate that 26 of the 46 (56.52%) agree that complaints are low and therefore the Laboratory is performing well, 13 of the 46 (28.27%) are uncertain, and 7 of the 46 (15.21%) disagreed.

The courts are the final recipients of the services and products of the Laboratory. The Forensic reports are presented in courts as evidence, and in some instances Forensic Analysts present their reports orally in court. The court relies on Forensic reports to reach their conclusions.

The purpose of this statement F4 was to determine whether employees are aware of any court that is not happy or not satisfied with the services from the Laboratory. The responses illustrate 36 of the 46(78.27%) are of the opinion that courts are satisfied with the services of the Laboratory, 5 of the 46 (10.27%) don't know and 5 out of 46 (10.27%) disagreed.

The purpose of statement F5, was to determine whether the FSL negatively affects the administration of justice. In this context as the saying goes "justice delayed is justice denied", delayed reporting may hinder the administration of justice. Cases are thrown out of court if the state postpones its case due to insufficient evidence. The responses indicate that the FSL does not negatively affect the court proceedings or administration of justice, as 35 of the 46 (76.09%) agree that the FSL does not contribute to court postponements, 5 out of 46 (10.87%) are uncertain, whereas 6 out of 46 (13.04%) think that FSL affects courts negatively because of delayed services.

5.4 Discussion of results

5.4.1 Leadership

In chapter two of this study it was revealed that Leadership commitment to quality principles leads to organisational performance and quality improvement. The previous studies (Inderlal, 2013; Samson & Terziovski, 1998; Masejane, 2012) and many others indicate that when the dimensions of TQM leadership are implemented by an organisation, performance objectives can be achieved.

The data gathered by means of the practical research indicates that the average level of agreement for eight dimensions of Leadership was found to be (63.85%), thus indicating that leadership dimensions of TQM are implemented at the Laboratory. Communication, provision of adequate resources, motivation of employees, and informing employees and management about involvement in quality activities results in attainment of performance objectives. A total of 16.09% of respondents are uncertain, while (14.35%) indicated that management does not follow the TQM

principles, indicated as dimensions in this study. One dimension that scored low on agreement, is that of management encouraging employees to participate in decision making, which received a negative response of (86.96%) - respondents are adamant that management does not provide employees with an opportunity to be part of decision making. This simply means that, for the Forensic Science Laboratory to improve its performance, employees must participate in decision making.

5.4.2 Employee involvement

In this study, respondent's average level of agreement (63.04%) for the eight dimensions of employee involvement, as identified in chapter two of this study, indicated the contribution of employees when they are involved, trained and empowered. There was a relatively low average disagreement at (30.70%). A lack of involvement of employees in decision making proves to be a cause of low performance. Therefore, Laboratory non-achievement of performance goals can be attributed to management making decisions on their own without involving employees or seeking their inputs. A total of 76.09% believe that systems in the Laboratory prevent employees from being part of decision making. Resource allocation proved to be the main contributor to positive responses (80.43%) to organisational performance of the Laboratory, followed by empowerment and training and development of employees to perform their duties.

5.4.3 Customer focus

In this study, customer focus dimensions exhibited a significant and positive relationship with organisational performance. This is in agreement with the study by Inderlal (2013), where it was found that customer focus contributed more to performance than any other variable. The results of this study revealed an average agreement response of 79.62% as compared to a mere 11.68% that are in disagreement. The Forensic awareness and Forensic fact file are the main catalysts of customer focus, at agreement levels of 93.48%. It can be claimed, as supported by the results of this study, that the Forensic awareness and Forensic Fact Files enhance the understanding of customers' current needs and expectations and promotes interaction between customers and the FSL.

Customer focus was found to have a positive and significant relationship with organisational performance, as customer satisfaction exhibited a high 84.79% positive response. The results of customer satisfaction as perceived by employees in their interaction with customers yielded a high score of 78.27% and reduction in customer complaints at a satisfactory 56.52%.

5.4.4 Quality improvement

The results of the study revealed that there is a correlation between reduction of non-conforming work and organisational performance. Competency and capacity of the Laboratory to perform its function result in attainment of performance objectives. Overall 77.82% agree that by reducing non-conformance, increasing competency and conformance of international standard ISO standards contributes to Organisational Performance. Improvement of the quality of forensic reports at a 82.60% response contributes to courts being satisfied, with a quality of evidence response of 71.73% for organisational performance. It can be concluded that quality improvements are positively related to organisational performance.

5.4.5 Organisational performance

Organisational Performance was measured in terms of customer satisfaction, less or no negative media reports, performance in court, conformance of ISO standards and reduction of non-conforming work. Customer satisfaction, negative media reports, reduction in late delivery of Forensic test reports and by not contributing to court postponements, which are the performance goals of the Laboratory, score high on employee perceptions, with 69.57% agreeing that quality improvement, leadership and involvement of employees leads to organisational performance.

5.5 Chapter summary

This chapter presented the data analysis and provided a pictorial illustration of results in the form of bar charts for each of the five variables of this study. A comprehensive description and discussion of results for each variable was provided in this chapter, how each of the statement in the questionnaire was answered and how each was answered. The chapter concluded by a discussion of the responses for each variable.

6 Chapter 6: Findings, Recommendation and Conclusions

6.1 Introduction

Based on the theory and literature review presented in chapter two of this study, the theoretical research framework was developed that sought to illustrate the importance and effect of TQM elements on quality improvement and organisational performance. As was identified in chapter two, the three elements of TQM used in all the empirical studies, are leadership, employee involvement and customer focus. In Chapter four, as the results of the framework, hypotheses for this study were formulated. These hypotheses were tested by employing survey using questionnaires distributed to employees at the two buildings using the FSL as a case study.

This chapter presents the general findings that illustrate whether or not the objectives of this study were achieved. The outcomes of the hypothesis tests are illustrated and whether the outcomes are supported by any of the empirical studies presented in chapter 2 including the few of quality gurus. Then this chapter ends with the conclusions and recommendations based on the findings. Finally the study limitations, lessons learned and possible areas of future research are discussed.

6.2 General findings

6.2.1 Research objective 1

The research objective number one for this study was to develop a framework that indicates the relationship between TQM elements with quality performance and quality improvement. Kalashe (2013:91) indicates that a literature review of previous similar studies provides the researcher with different perspectives about the subject of interest. The researcher conducted a search of literature on TQM and Organisational Performance, and came across many studies that looked at the relationship between TQM and Organisational Performance. Because there were few South African studies, the researcher relied on information from overseas countries. These studies provided the researcher with the insight about TQM and the link with organisational performance. The research by Inderlal (2013) assisted the researcher to craft a working framework, and to achieve objective 1.

6.2.2 Research objective 2

The second research objective was to discuss and provide a theoretical background of TQM elements, and conceptualise TQM and organisational performance. To achieve this, the researcher conducted an extensive review of academic literature, analysing the contribution of quality gurus to the concept of TQM. The use of TQM was assessed in performance enhancement by analysing the different national and international awards and their contribution to organisational performance. In conclusion the researcher explained the differences between TQM and the Quality Management System ISO Standard.

6.2.3 Research objective 3

The third objective investigated the effect of TQM elements on organisation performance through a critical analysis of previous studies that looked at the relationship between these variables. This was done at the end of chapter 2.

The results of the review revealed a positive and significant relationship between TQM and organisational performance. Further analysis of these studies, Mehmood, Qadeer and Ahmad (2014); Prajogo and Sohal (2004); Mohammadi (2014); Rahman and Bullock (2004) and many others revealed that not all elements of TQM have an effect on organisational performance. This provided the researcher with guidance on which TQM elements to examine for this study.

6.2.4 Research objective 4

This research objective identified the dimensions of the three TQM elements that measured the effects of leadership, customer focus and employee involvement on organisational performance. There were eight dimensions for each of the TQM elements of leadership, customer focus and employee involvement. Five dimensions per dependent variable for the organisational performance and quality improvement was identified. These dimensions were structured into statements divided into sections of the questionnaire used for the empirical study.

The intention of the research was to distribute the questionnaires to the customers of FSL, but due to low return of distributed questionnaires, the researcher only studied the perception of employees. Fifty questionnaires were handed out personally by the researcher to available and willing employees.

6.3 Study findings

6.3.1 Hypothesis testing

6.3.1.1 Leadership

The empirical data for this study has shown that the Leadership of FSL as indicated by employee's perceptions, contributes to the attainment of organisational performance objectives. Dimensions contributing positively are leadership being involved in quality activities, making employees aware of customer needs, management making employees aware of non-performance and allocation of resources. It can be concluded that leadership commitment to quality has a positive effect on organisational performance. This finding is supported by Inderlal (2013) and Chepkech (2014) that resource allocation and management motivation of employees are the biggest contributors to performance. Samson and Terziovski (1999) also support the findings by indicating that the TQM elements of leadership, human resources and customer focus are positively related to organisational performance.

However similar to the current study, Inderlal (2013) and Chepkech (2014) both indicated that managers do not involve employees in decision making and setting organisation performance goals. This is the view of the FSL employees, where 40 out of 46 agreed that managers do not involve them in decision making, five (5) of the 46 were uncertain and only one (1) indicated that managers do involve them. Green (2017) on the other hand indicates a lack of management support as a barrier to performance. Therefore, for performance to improve, FSL management must work with employees, formulate performance goals and involve employees in decision making.

The quality awards mentioned in chapter two such as the Deming Prize, EFQM, MBNQA and SAEM all use Leadership as a criterion to determine performance attainments and quality improvement. Winners must demonstrate that their leaders are committed to quality, are proactive, share the vision and mission with all employees, allow employees to participate in decision making, act as role models, and inspire employees to better their performance.

The moderate number respondents of this study (63.86%) agreed that the Forensic Science Laboratory management exhibits leadership qualities and principles as

advocated by quality gurus mentioned earlier in chapter two. These results provide FSL with information that can be used to improve performance and quality of services.

6.3.1.2 Employee involvement

The researcher, in this study was interested in the respondents' perceptions about their role in the organisation; the training offered; whether they have adequate resources to perform their functions; whether employees are empowered to take decisions, taking into consideration the culture in the SAPS; whether employees support each other and work as a team; and importantly whether they are involved in decision making.

The above-mentioned dimensions of employee involvement were used by many scholars to measure the effects of employee involvement on organisational performance.

Inderlal (2013) examined the role of TQM on the improvement quality and achievement of organisational performance of Kwazulu Natal footwear manufacturing organisations. That research used dimensions of, empowerment of employees to continuously improve output, team work, sufficient resources, whether employees were encouraged to give suggestions and whether the employee's suggestions were objectively evaluated. The study found that the surveyed organisation did very little to empower their employees and did not allow them to use their skills and knowledge and that members did not work as teams. Respondents in the current study indicated that employees do not work as teams, and by same margin of 3.1%, as reported by Inderlal (2013:114), respondents indicated they are not adequately trained. Employee involvement does not have a significant influence on Quality Improvement and Organisational Performance.

On the contrary, this study found employee involvement to have a significant positive relationship with organisational performance and quality improvement. The respondents agreed that employees support each other, with 37 out of 46 indicating that adequate resources are allocated, and 33 out of 46 indicating that employees are adequately trained to perform their functions.

Whereas Inderlal (2013:115) recommends that team work must be encouraged, employees trained to improve their skills, communicate to all employees, and improve

employee relations to enable the surveyed footwear organisation to improve performance. Coning (2009) likewise reported that a lack of employee involvement in quality activities, such as team work, decision making and training, resulted in poor quality products. A low 30% of respondents in that study indicated that team work is encouraged.

Sabella, Kashou and Omran (2014) used similar dimensions of employee involvement as the ones for the current study, but referred to them as human resource focus. These were empowerment of staff, team work, motivating employees to continuously improve, and training members in quality concepts. Their results indicated that a focus on humans as a factor has a strong predicting power of performance. This finding is supported by Samson and Terziovski (1999).

The above-mentioned studies, Samson and Terziovski (1999), Sabella, Kashou and Omran (2014), Mehmood et al. (2014) and many others found employee involvement to have a positive significant effect on organisational performance including those that found a lack of employee involvement. Inderlal (2013) and Coning (2009) agree that a focus of humans in terms of total quality management principles can result in improved quality and performance.

This majority of responses in this study (37 out of 46) agreed that employees are adequately trained to perform their duties, and same numbers indicated that resources are adequately distributed. A total of 35 out of 46 respondents indicated that employees are empowered to take decisions. These elements are advocated by most quality gurus such as Deming, Juran, Crosby Feigenbaum and Ishikawa as main contributors to quality improvement and organisational performance. These elements of human focus are also used as criteria for the quality awards mentioned in chapter two, the MBNQA, EFQM and our own SAEM. These elements are used to measure performance of any organisations that participate.

6.3.1.3 Customer focus

This study identified similar elements of customer focus to those used in most of the Quality awards as their criteria to determine organisational performance and quality improvement. Customer focus is emphasised by many of the Quality gurus mentioned

in chapter two. In this study customer focus was found to have a significant and positive relationship with organisational performance.

As discussed in chapter two of this study, Mehmood, Qadeer and Ahmad (2014); Prajogo and Sohal (2001) and Inderlal (2013), found that customer focus does not have impact of organisational performance. Inderlal (2013) indicates that to enable footwear organisations surveyed to enhance their performance, customer needs and expectations must be known and understood. Customer satisfaction must be the ultimate aim as well as establishing of communication channels with customers.

These attributes are recommended by Inderlal (2013), Mehmood *et al.* (2014) and many other, as areas that can improve performance and quality. The FSL did well, as 38 out of 46 (82.60%) respondents agree that customer needs and expectations are understood. A total of 43 out of 46 (93.48%) indicate that the communication channels with FSL customers is available and adequate and provides a perfect platform to understand customer needs and expectations.

6.4 Organisational performance

Coning (2009:41) states that a quality driven organisation meeting customer requirements is key to never-ending improvement that eventually results in quality improvement and organisational performance. Further stated is that performance information is key to effective management, alerts managers to problem areas and enables improvement.

The Forensic Science Laboratory as mentioned in chapter three of this study, is a quality driven organisation that views customer satisfaction as their performance indicator. The organisational performance as indicated earlier is a measure of the time taken to deliver a forensic test report. This is determined by customer needs and expectations.

In this study organisational performance was measured by customer satisfaction, negative media reporting, decreases in customer complaints, quality of forensic reports and forensic reports delivered when needed. Respondents agree that customer satisfaction has increased, negative media reports are down, courts are no longer affected by late reports and customer complaints are down. This finding is supported by Jørgensen and Nielsen (2013) that understanding customer needs and

expectations, dealing with external requirements, and ensuring that performance is customer driven leads to organisational performance.

6.5 Significance of this study

The significance of this study is that it provided guidance for future studies on the use of TQM elements to improve performance at the Forensic Laboratory and similar environments. The researcher hopes to inspire other studies in the same field. Organisations invest in management systems without knowing the value of that system or being able to prove returns on their investment. Studies of this nature will therefore assist organisations including the Forensic Science Laboratory to be able to assess the value of TQM. Implementation of quality system does not come cheap, and if results are not measured, then the benefit of the system will not be realised.

Furthermore the insights provided by this study will enable the Forensic Science Laboratory to address the short comings hindering attainment of performance goals. As one of the aims of this study is to promote TQM, the findings and future studies may motivate the use of quality management systems to achieve organisational performance.

6.6 Limitations

In addition to perceptions of employees, the intention of the research was to understand the views of Detectives. However the poor response of Detectives led the researcher to only use FSL employees, which may have led to biased results in areas of customer satisfaction. The researcher hopes this study will inspire Detectives to volunteer their time and participate in any future studies.

6.7 Conclusion

The Forensic Science Laboratory has made progress with implementation of a quality management system. The findings indicated that by not involving employees in setting performance goals and other decision making leads to non-achievement. The Laboratory is doing well with training and competency of employees to perform functions and in making required resources available.

This study proved that Forensic awareness and forensic fact files contribute to attainment of performance objectives and understanding customer needs. The TQM

elements investigated for this study were proved to have an effect on organisational performance.

6.8 Recommendations

This study recommends that South African Police Service encourages future studies that test the effects of elements of total quality management of organisational performance and furthermore to encourage employees to volunteer and participate in any study that is conducted in the SAPS, since that lack of participation of Detectives contributed to limitations for this study.

It is further recommended that the Forensic Science Laboratory enhances and support the Forensic Awareness programmes as they proved to be key in harnessing customer interaction and communication that enable the organisation to understand customer needs and expectations.

It is evident that employee involvement is lacking in the organisations and this lead to failure for organisation to attain some of its performance goals. This study recommends that top management establish systems that enables employee involvement to increase.

This study also recommends that FSL management be enlightened on the contribution and importance of total quality management practices on organisational performance and enhance the level of top management commitment.

Lastly this study recommends that SAPS management enlighten all its employees about the importance of research and that the SAPS rely on empirical information to make strategic decisions and any other decision about the organisation.

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Employee Involvement and participation

Dear Participant

This questionnaire forms part of a research project for the purpose of the fulfilment of the requirement for a Master's Degree. The aim of the research is to investigate the effects of Total Quality Management (TQM) principles on Organisation Performance at the South African Police Service: Forensic Science Laboratory (FSL).

Voluntary Participation

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

Consent

By continuing with the questionnaire will mean that you give consent for the information you provided to be used for this study. In this form your identification details will not be required, this will ensure that you remain anonymous.

Instruction for Completing the Questionnaire

- This form may be completed by any current member of SAPS: Forensic Science Laboratory.
- You are requested to complete the questionnaire to the best of your ability and answer all questions. There is no right or wrong answer.
- The response to questions including the participant will be treated with strict confidentiality.
- Mark your response that best represents your perception, knowledge or opinion.
- The form is for individual and not group.
- Please complete and return the form to: dakup@saps.gov.za or deliver the form at any Case reception: General Piet Joubert Building.
- You are welcomed to direct any questions to Colonel THP Daku at 071 475 2903 or 012 401 3210 or at above-mentioned email.
- You are kindly requested to make a cross or tick in the applicable place.
- Your participation is voluntary and highly appreciated

SECTION A:

Are you currently employed at SAPS: Division Forensic Services?

Yes NO

I am attached at Component: FSL Quality CR-CSM

Section/Unit

Number of year in SAPS: Forensic Services: less than 1 year

1-3 years 3-6 years 6 – 10 years more than 10 years

Rank:

Constable	<input type="checkbox"/>
Ass Forensic Analyst /(Sgt)	<input type="checkbox"/>
Forensic Analyst / (W/O)	<input type="checkbox"/>
Forensic Analyst Supervisor / (Captain)	<input type="checkbox"/>
Forensic Analyst Commander / (Lt- Col)	<input type="checkbox"/>
Forensic Analyst Section Commander (Colonel)	<input type="checkbox"/>
Section Head /Brigadier	<input type="checkbox"/>

INSTRUCTION: Please indicate the extent to which you agree with the following statements.								
SECTION B: LEADERSHIP COMMITMENT								
Mark the appropriate box with an 'x'.		AGREE COMPLETELY	STRONGLY AGREE	SOMEHOW AGREE	NEITHER AGREE NOR DISAGREE	SOMEHOW DISAGREE	STRONGLY DISAGREE	DISAGREE COMPLETELY
B1.	Management do communicate organisation goals							
B2.	Management makes employees aware of non-performance							
B3.	Management involves employees in setting organisation's / Section goals							
B4.	Management allocates adequate resources towards efforts to improve performance							
B5.	Management motivates all employees to achieve satisfactory performance							
B6.	Management encourages the participation of employees in decision making							
B7.	Management makes employees aware of customer needs							
B8	Management involvement in quality activities is adequate							
SECTION C: EMPLOYEE MANAGEMENT								
Mark the appropriate box with an 'x'.		AGREE COMPLETELY	STRONGLY AGREE	SOMEHOW AGREE	NEITHER AGREE NOR DISAGREE	SOMEHOW DISAGREE	STRONGLY DISAGREE	DISAGREE COMPLETELY
C1.	Employees are adequately trained to perform tasks							
C2.	Employees are allocated adequate resources to perform duties							
C3.	Employees are empowered to continuously improve work output							
C4.	Employees are encouraged to give suggestions							
C5	Employees are trained in quality courses							

C6	Employees are involved in decision making							
C7	Employees support each other							
C8	Employees encouraged to put quality first before quantity							
SECTION D: CUSTOMERS FOCUS								
Mark the appropriate box with an (X)		AGREE COMPLETELY	STRONGLY AGREE	SOMEHOW AGREE	NEITHER AGREE NOR DISAGREE	SOMEHOW DISAGREE	STRONGLY DISAGREE	DISAGREE COMPLETELY
D1.	The Laboratory is aware of customer current expectations							
D2.	The Laboratory is aware of customers future expectations							
D3.	Customer satisfaction is the ultimate aim of the Laboratory							
D4.	The Laboratory has established a communication channel through which customer can provide feedback. Forensic fact File							
D5.	Customer feedback is taken into consideration							
D6.	Customer complaints are taken seriously							
D7.	Forensic fact files focus on getting customers to be better informed							
D8.	Forensic Fact files are established as a communication tool to customers							
D9.	Forensic awareness is focused on getting customers to understand the services of the Laboratory							
D10.	Forensic awareness is a perfect tool for interacting with customers							
D11.	Forensic awareness is a perfect platform to understand customer needs							
D12.	Forensic awareness is a tool to improve quality performance							
D13.	Forensic awareness is a tool to improve customer relationship							

SECTION E: QUALITY IMPROVEMENT								
Mark the appropriate box with an 'x'.		AGREE COMPLETELY	STRONGLY AGREE	SOMEHOW AGREE	NEITHER AGREE NOR DISAGREE	SOMEHOW DISAGREE	STRONGLY DISAGREE	DISAGREE COMPLETELY
E1.	Exhibit losses have been reduced							
E2.	Measures to improve safeguarding of exhibits have been improved.							
E7.	Non-conformances have been reduced							
E10.	Competency of members is adequate							
E11.	Quality is not compromised							
E13	Quality of reports have improved							
SECTION F: ORGANISATIONAL PERFORMANCE								
Mark the appropriate box with an 'x'.		AGREE COMPLETELY	STRONGLY AGREE	SOMEHOW AGREE	NEITHER AGREE NOR DISAGREE	SOMEHOW DISAGREE	STRONGLY DISAGREE	DISAGREE COMPLETELY
F1.	Customer satisfaction has improved							
F2.	Negative media reports have decreased							
F3.	Customer complaints have decreased							
F4.	Courts are satisfied with quality of evidence							
F5.	Court postponements due to late test reports have decreased							
F7.	Competency of members has improved							