# CHAPTER 1

# INTRODUCTORY EXPLANATION OF THE THESIS

## 1.1 INTRODUCTION

Total Quality Management is a complex concept that has been internationally applied in diverse economic sectors. This study focuses particularly on a framework for the implementation of Total Quality Management in the South African Air Force. This chapter sets out the design of the study and provides information on the philosophy underlying Total Quality Management. An overview is provided to serve as the frame of reference for the research. This includes a rationale for the research orientation, as well as background information pertinent to the thesis in order to put the problem in context. It also presents the research plan, which reflects the choice of the study subject, the problem statement, the objectives of the study, a hypothesis and research assumptions. Furthermore, an exposition is provided of the demarcation of the study, the research methods and reference technique used, and the abbreviations that appear throughout the thesis. This is followed by a concise explanation of terms frequently used and peculiar to the thesis. Finally, the contents of further chapters are briefly summarised, before concluding with a summary of the information contained in this chapter.

## 1.2 BACKGROUND TO THE STUDY

The establishment and existence of the South African National Defence Force (hereinafter referred to as the SANDF), and therefore also the South African Air Force (hereinafter referred to as the SA Air Force), are in accordance with the South African White Paper on Defence 1996 (ISBN 0-9584190-8-6 1998:1) and Defence Act, 1995 (Act 44 of 1995). A conventional air capability is of particular importance to the Republic of South Africa (hereinafter referred to as the RSA). In order to maintain the competitive edge, the SA Air Force must retain its conventional air capability and continuously develop the accompanying high level of technology. An effective SA Air Force is essential for the protection and safeguarding of the people of the RSA who are the customers of the SA Air Force. The SA Air Force is a national asset that has been

built up over many years through the contributions and experience of its members. The RSA taxpayer also made a huge financial contribution to this national asset. The SA Air Force is irrevocably committed to service of a high standard to the RSA and its entire people. The RSA can only develop politically, socially and economically if a stable environment is maintained. As part of the RSA security forces, the SA Air Force plays an essential role in maintaining this stable environment.

In order to fulfil its important role in the RSA, the SA Air Force is a complex institution influenced by many factors. Unexpected and far-reaching changes experienced at political, socio, economic, cultural and technological levels are currently strong driving forces that have an influence on the functioning of the SA Air Force. The following proves this, namely:

- the transformation that has been in process since 1994, whereby the SA Air Force as a whole is made more streamline;

- the role played by South Africa and in particular the air power of the SA Air Force in the Southern African Development Community (hereinafter referred to as SADC);

- the role fulfilled by the air power of the SA Air Force during peacekeeping operations on the African continent (for example in Burundi and the Democratic Republic of the Congo);

- the extent of humanitarian aid provided by the SA Air Force to South Africa and its neighbouring countries; and

- the new Strategic Defence Packages[1] that the SA Air Force will receive from 2004 to 2014.

Apart from the results of the above-mentioned unknown and far-reaching changes, there is also the problem of the ever-decreasing budget of the SANDF and the management of resources within this smaller budget - aspects that the SA Air Force

[1] The purchasing of new aircraft systems for the SA Air Force.

continuously has to bear in mind. Owing to these circumstances, managers currently find themselves in an uncertain and demanding situation. On the one hand they have to ensure harmony within the institution, while on the other hand they have to ensure that resources are fully utilised to the satisfaction of the SA Air Force and the community. Ever increasing pressure is placed on the SA Air Force to utilise resources more cost-effectively. The challenge is to attain more objectives with fewer resources - a situation that has been experienced for the past eight years. All indications are that the declining tendency to provide resources will be continued and that even bigger budget cuts will be made. This declining tendency has made it essential for top management to strive for continuous improvement in management. Stronger emphasis is placed on better results with less personnel, products and systems in order to promote quality internal and external service rendering. The SA Air Force strives to show improvement in respect of operational results, financial results, marketing results, community results and customer and employer satisfaction. Management wrestles with questions such as how to manage diverse challenges in the changing political, socio and economic cultural and technological environment and how to ensure that resources are controlled effectively. The SA Air Force is currently in an era where military operations enjoy low priority; therefore high levels of expertise and professionalism are essential in order to maintain the desired credibility and degree of military deterrence.

The SA Air Force has clearly noted the changed environment and fully accepts its responsibility and role. The SA Air Force entered the new millennium as an institution committed to overcome the challenges presented by (1) the transformation process, (2) its responsibility to the SADC, (3) its role and functions in peace-keeping operations on the continent of Africa, (4) the humanitarian aid that has to be offered to neighbouring countries and (5) the integration of the Strategic Defence Packages. The changing circumstances force the SA Air Force to continuously strive for better work performance and to take pro-active steps to comply with the changing environment. The essential role played by employees, providers and users in the SA Air Force is regarded as more important as changes develop. To survive, the SA Air Force realises that a new management approach is essential in order to manage output correctly. Employees must also be managed effective and efficiently in order to maintain and/or improve performance levels. Various quality-based models, methods and methodologies have been used since 1994 to manage the SA Air Force. Most of these models, methods

and methodologies function successfully, but they have not been combined into a single integrated management system.

According to Major General Carlo Gagiano (Gagiano 2001:3) the solution to the mentioned challenges lies in the SA Air Force asking itself whether it wants to act pro-actively and establish quality-focussed customer centred programmes, or if it would rather cling to the past at the expense of the future. Major General Gagiano is of the opinion that the SA Air Force can make a valuable contribution over the next few decades should it institute a Total Quality Management (hereinafter referred to as TQM) philosophy in order to focus the SA Air Force on improvement. In 1998 a decision was made to apply more "quality management techniques" in order to increase performance results and productivity.

One of the methods followed was the establishment of a formal self-assessment programme based on the model of the European Foundation for Quality Management (hereinafter referred to as EFQM) that was launched in August 1999 by the Inspector General of the SA Air Force with the following specific instruction: "The SA Air Force must be evaluated on a continuous basis in order to increase productivity, to determine exactly what the weak and strong points of the SA Air Force are and to manage the SA Air Force according to an integrated management philosophy" (Msimang 1999:6). At the end of the year 2001 the SA Air Force changed the formal self-assessment programme from the EFQM model to the South African Model, instituted by the South African Excellence Foundation (hereinafter referred to as the SAEF). The top management of the SA Air Force indicated their commitment to TQM by setting the following general objectives, namely:

- to determine the performance of the SA Air Force on the basis of an internationally recognised management philosophy;
- to make the personal initiatives and interest of the Chief of the Air Force in respect of TQM more visible;
- to force the SA Air Force to continuously evaluate and improve itself owing to ever changing circumstances;
- to achieve objectives in a more effective manner as opposed to an approach that the best results must be achieved at all cost;

- to improve the financial situation of the SA Air Force by means of improvement in quality so that weapon system[2] projects can be launched; and
- to realise that the SA Air Force as part of a bigger government department should make a valuable contribution to improve quality in national interest.

It was also decided that the emphasis should be on service rendering, employee empowerment and the use of the SAEF model as management model based on the national quality criteria for self-assessment purposes. The top management of the SA Air Force decided to use the SAEF model for the following reasons:

- The SAEF model, based on total quality principles, serves as a solid basis to manage the eight SA Air Force Bases according to a recognised management model.

- The SAEF model serves as a prerequisite for an institution to become a world-class institution.

- The SAEF model provides all the important dimensions needed to implement TQM.

- The SAEF model serves as a method to integrate all the SA Air Force's existing management systems into a single management system, with the aim of steering all air force bases into the same strategic direction.

- The SAEF model can be used to improve communication, participation and cooperation.

- The SAEF model can be used to continuously identify areas for improvement.

- The SAEF model can be used on a daily basis to improve performance.

[2] All primary mission equipment like aircraft, including all relevant elements required managing and maintaining the aircraft system as a mission-ready unit.

- The SAEF model can serve as a framework for further integration.

Based on the above, the SA Air Force is evaluated annually according to the SAEF model since January 2002. To enable the SA Air Force to determine results and areas for improvement continuously, it became clear that a new approach to management was needed to manage all management initiatives based on the TQM philosophy in order to ensure improved performance. Since the implementation of the EFQM model in 1998 and the SAEF model in 2001, TQM has become a term that is used with high frequency by employees of the SA Air Force. Top management often uses the term "quality excellence" when delivering speeches, at meetings and during explanations. Reference is often made to the successes achieved by the Americans and certain European countries since applying TQM. These actions clearly indicate that a need exists within the SA Air Force to pay attention to the establishment and improvement of quality. Unfortunately many inconsistencies exist with regard to the use of the term "quality". This aspect will be discussed in more detail in this thesis in chapter 2, paragraph 2.2.

Dale (2003:3) and Ghobadian, Gallear, Woo & Liu (1998:2) indicate that TQM is a management philosophy and is one of the most accepted and used strategies of the 20th century in America and Europe to improve the productivity of an institution. In the past the focus of TQM was mainly on production, but since 1990 it began to play an important role at service institutions in (especially) America. Evans & Dean (2003:6) stated it clearly that all institutions – large and small, manufacturing and service, profit and non-for-profit – can benefit from applying the principles of total quality. However, it is a relatively new approach in the service sector. Service institutions include hotels, health, legal, engineering, defence, and other professional services; educational institutions; financial services; retailers; transportation; and public utilities.

According to Douglas & Judge (2001:158) and Evans & Dean (2003:8), a major problem that is experienced is that many institutions accept the TQM philosophy, but seek shortcuts in the implementation thereof. Such an approach can result in failure. The point of view of the SA Air Force is that TQM is a long-term and cost-intensive effort with no shortcuts for implementation. It became clear that research on TQM must be regarded as "essential" or "very important" and "very urgent" (Msimang 1999:7).

According to Claver, Tarí, & Molina (2003:91) and Goodman, O'Brein & Segal (2000:47) the most important and only reason for TQM implementation is to improve institutional performance in all areas (service-rendering results, financial results, customer results, marketing results, operational results, community results and employee results).

Bearing the above-mentioned background information with regard to TQM in mind, the reason for this study is to examine the nature and scope of TQM implementation, based on a framework, as one of the internal organisational arrangements of the South African Air Force Bases (hereinafter referred to as the SA Air Force Bases). **However, the question that arises is why TQM has to be researched?** The change over to TQM is currently very popular in the SA Air Force as a method to improve general service rendering, productivity and customer satisfaction. Although it is a relatively new and revolutionary approach in South Africa, more and more divisions in the SANDF are committing themselves to invest in TQM in the long term. Although many articles on TQM have been published in South Africa, the focus has been mainly on the importance of TQM techniques and the success thereof, with the result that to date little attention has been paid to the nature and scope of TQM implementation at military institutions.

Although the majority of articles for practitioners emphasised specifics of TQM (Yoo 2003:119), Sureshchandar, Rajendran & Anantharaman (2001b:343) state that little empirical research has been done on the effect of the implementation of TQM in the public sector and service institutions. Djerdjour & Patel (2000:25) state clearly that while TQM ideas are not new in developed nations, there is little literature and empirical studies available on TQM implementation in developing countries. Munro (2003:49) also indicate that TQM is a ubiquitous organisational phenomenon that has been given little empirical research attention. Dale, Wu, Zairi, Williams & Van Der Wiele (2001:440) points out that (1) the concept TQM has been around for a long time but has been given little attention by research teams in institutions and (2) TQM still needs to pass the empirical tests to derive general sable conclusions. To date only one empirical study has been done on the nature and scope of TQM implementation in the SA Air Force, namely "Quality Management at the Test Flying and Development Centre of the South African Air Force (Oschman 2002:i). Oschman limited his research to one

of the eight air force bases of the SA Air Force. In his dissertation, Oschman (2002:305) identified further areas of possible academic research with regard to TQM, namely research geared to established a TQM implementation plan for South African Air Force activities. In support of Oschman's research, Douglas & Judge (2001:158) found that only four percent of the 99 articles published from 1993 to 1997 on TQM "assessed the degree to which TQM interventions actually were in place." Given the complexity and pervasiveness of implementing TQM in an institution (Douglas & Judge 2001:158), it is important to assess the degree to which TQM practices have been implemented when evaluating empirically whether personnel members of an institution find the application of TQM acceptable (Hackman & Wageman 1995:309).

Proceeding from Oschman's (2002:305) identification of possible further academic research in the SA Air Force, this study focuses specifically on the setting and evaluation of a framework that can serve as an implementation plan for TQM in all eight of the SA Air Force Bases for the following reasons: primarily as a result of the point of view of Major General Gagiano to continuously evaluate the SA Air Force Bases in order to improve productivity, as referred to on the top of page 4, as well as the necessity and importance thereof for the consideration of a philosophy such as TQM, and secondary owing to the attention that the TQM philosophy is currently receiving (especially at American and European institutions). If the SA Air Force Bases do not have an implementation plan for TQM, do not restructure its processes, do not focus on its employees and do not show a better learning disposition, the opinion may be held that it is not in line with the latest way of thinking. During the establishment of a new paradigm, confusion, uneasiness, debate and rivalry can be expected between management in air force bases and those members who initiate the new programmes. Clear and strong leadership is essential to manage a philosophy that requires changes in behaviour and logic with regard to how an institution should be designed and structured.

There is no doubt that research with regard to TQM is essential and that information on the nature and scope of TQM implementation, based on a framework, as one of the internal organisational arrangements of the SA Air Force Bases, is of the utmost importance. As Oschman (2002:305) rightly remarks in his research, the need for study in this area has come to the fore and a framework for TQM implementation will

address research in the SA Air Force Bases, namely: To establish a TQM implementation plan for South African Air Force activities. Research in respect of TQM appears to be important and relevant and served as a further motivation of the necessity and relevance for research with regard to the influence of TQM implementation on the personnel of the SA Air Force Bases, based on a framework. To obtain more clarity on the reasons for choosing this subject, the choice of subject matter will now be discussed in more detail.

## 1.3 CHOICE OF SUBJECT MATTER

The author got to know the potential academic value of TQM implementation as an internal institutional arrangement at the SA Air Force Bases as a particularly interesting and useful field of study (Oschman 2002:305). The following observations and events were identified:

- The transformation programme followed by the SA Air Force since 1994, resulted in major changes to the organisational structure of the entire SA Air Force. The question now arises as to how quality management will function at transformed air force bases.

- One of the main reasons for the movement to TQM was the announcement of the new Strategic Defence Packages in 1996 that will amongst others result in the purchasing of new aircraft systems. The modernisation of aircraft systems and the consequent new technology will lead to an improvement in the air speed of aircraft and the efficiency of weapon systems. It requires that new systems based on changed technology be managed and maintained in the best possible manner. A further point of interest is the need to establish a total quality attitude amongst all members of the SA Air Force in order to ensure continuous improved performance of the expensive systems.

- The motto of the SA Air Force is “Our People, Our Air Force, Our Future”. Bearing this in mind, the SA Air Force realises that human resource must be regarded as its most important asset. The importance of this resource is confirmed by the prominence provided to man in the renewal Strategic

Transformation Plan, as detailed in the Vision 2012 of the SA Air Force. The SA Air Force is expected to accept full responsibility for the success of the Vision 2012 as a comprehensive plan to change and renew the SA Air Force. For the SA Air Force it is of exceptional importance as it requires specific capabilities and skills of its employees due to the technological environment within which they have to function. Owing to the drastically changed environment of the SA Air Force, human resources are regarded as the central point around which all activities must occur. It is the responsibility of the top management of the SA Air Force to lead its human resources to successful work performance.

- In 1998 great emphasis was placed within the SA Air Force on the necessity of a quality attitude amongst all members on a permanent and long-term basis in order to ensure continuous improved performance. During that year Major General Carlo Gagiano implemented the use of a quality based self-assessment model, namely the EFQM model, in the SA Air Force Bases to determine its performance according to an internationally recognised management philosophy. In the year 2000 Brigadier General Eksteen succeeded Major General Gagiano as the new Inspector General of the SA Air Force. He subsequently replaced the EFQM model with the SAEF model. The implementation of this quality based self-assessment model served as a stimulus for this study.

- On closer examination it became clear that quality obtained new stimulus amongst employees once members from the Office of the Inspector General of the SA Air Force have conducted evaluations based on the EFQM model at air force bases. This observation was amongst others made by comparing the results of the inspections conducted with those previously obtained by members from the Directorate Management Services (hereinafter refer to as DMS). From this comparison it appears as if there was a shift in emphasis in the management mechanisms identified by the Inspector General to improve the results of the SA Air Force Bases. DMS either did not point out contentious matters during their evaluations, or they suppressed/ignored them. It is therefore clear that the SA Air Force has became more open in its approach to its employees and as to what was expected of them. From the contents of the new evaluations based on the

SAEF model, it is clear that contentious matters with regard to especially the welfare of the SA Air Force Bases are currently receiving more attention.

- In 1997 the productivity award of the National Productivity Institute (NPI) was awarded to the SA Air Force. This reward is presented annually to institutions that show exceptional productivity improvement and who have made significant contributions to an increase in productivity. In 1997 and 1998 the SA Air Force was awarded silver and gold productivity awards. These awards were made to the bases in the SANDF that had shown exceptional productivity improvement. Since 1999 the SA Air Force no longer participates in this competition owing to the fact that the Office of the Inspector General of the SA Air Force has taken over the responsibility of DMS with regard to evaluations/inspections. The Inspector General introduced a new approach to evaluations/inspections with a view to improve the results of the SA Air Force Bases, with the emphasis on quality. Top management regarded this improved evaluation/inspection system as essential in order to keep personnel at the various bases informed as to the position of their base and as a means to make the problems experienced at bases visible. The Inspector General aspires to improve the productivity of all bases in the SA Air Force, to limit expenditure as much as possible and to foster a culture where all personnel members are treated as customers. These changes also served as a stimulus for this study.

- The SA Air Force realised that it had many internal and external suppliers and customers with whom they had to cooperate. The SA Air Force employs the services of contractors and consultants in the private sector for the maintenance of various systems, amongst others ground systems, aircraft systems and subsystems of various main systems (Palmer 1998:5). These institutions are contacted on a daily basis and cooperation occurs in a coordinated manner. However, the question that arises is how management at military institutions, such as the SA Air Force Bases, must occur in order to ensure satisfaction amongst internal and external suppliers and customers.

- The implementation of the Public Finance Management Act, 1999 (Act 1 of 1999 as amended by Act 29 of 1999) together with the promulgation of the Public

Service Act (Act 103 of 1994) and the Public Service Regulations (PSR), 1999 prescribe measures to promote the efficient, economic and effective use of resources in the SA Air Force. These public policies require departments in the SA Air Force to develop and establish systematic management systems as to ensure that all SA Air Force resources (assets and liabilities) are managed efficiently, economically and effectively. They also provide a hierarchy of accountabilities, roles, responsibilities and functions for sound administration. Faced with this together with degenerating of physical infrastructure within the SA Air Force, the leaders of the SA Air Force have recognized the growing need for TQM to provide both long-term direction and a short-term operating framework. TQM can help the SA Air Force's leaders determine where the SA Air Force ought to be going, identify the resources it needs to get there and develop the long- and short-term action plans required to accomplish its objectives. These requirements also served as a stimulus for the study.

- Reed, Lemak & Montgomery (1996:67) indicate that TQM research is important since TQM has practitioner origins and management theory should address the practice. These authors continue and mention that despite the amount of research on TQM there is little attention given to TQM in the literature. This supports the fact that in spite of all research, TQM is still in the early stage of theory development (Dale *et al*. 2001:440; Taiwo 2001:968) and there is a need for further research on TQM (Wicks 2001:501), especially in its theoretical foundation, what makes it work, why so many institutions have had problems implementing it, and under what circumstances it may create a sustainable advantage for institutions. This need for further research on TQM also served as a stimulus for this study.

- Allen (1998:2) states that research on TQM requires both qualitative and quantitative studies. Leonard & McAdam (2001:181) indicate that resent research on TQM have addressed the importance of qualitative research (grounded theory) in understanding the TQM implementation process. Although qualitative studies can provide in-depth insight about TQM implementation, the result may not be generalised. At the same time, quantitative studies cannot provide in-depth understanding of the process. What is needed for theory generalisation on TQM

is the application of both quantitative and qualitative studies in a single study, a mixed-methodology design. (Creswell 2002:24.) The need for a mixed-methodology design based on quantitative and qualitative studies on TQM also served as a stimulus for this study.

- Djerdjour & Patel (2000:26) and Eng & Yusof (2003:65) define TQM as an integrated management process that has to take place in a coordinated manner in order to ensure that the institution satisfies both the needs and expectations of customers. TQM involves all divisions, departments and levels in an institution. Top management initiates and manages the general strategy and all activities focussed on the needs of the customer, while at the same time developing a culture of high employee participation at the institution. TQM also focuses on the systematic management of data in all processes and work procedures in order to prevent money being wasted and to maximise improvement continuously. The aim is to add value for the customer at the lowest cost possible and to establish economic stability at the institution. Top management must guide the institution strategically and be committed to a vision to train and empower employees to achieve a common mission. To be successful, teamwork is a prerequisite in order to ensure continuous improvement in the quality of products, services, people and processes. Long-term and not only short-term relations with customers, suppliers and employees are essential to successfully establish total quality at an institution. In this study this theory, amongst others, is tested at the SA Air Force Bases.

## 1.4 PROBLEM STATEMENT

No research work, as yet, has collectively taken all the observations and critical unanswered questions in paragraphs 1.2 and 1.3 into consideration and provided a framework for the effective implementation of TQM at the SA Air Force Bases. Proceeding from the observations and critical unanswered questions in paragraphs 1.2 and 1.3, this is all the more essential to determine the nature and scope of TQM implementation, based on a framework, at the SA Air Force Bases, from the point of view of the organisational science as part of the subject matter of Public Administration.

In view of the background and rationale for this study provided above, the main problem to be addressed by this study therefore is: **What is the nature and scope of TQM implementation, based on a framework, as an internal organisational arrangement for personnel at the SA Air Force Bases, examined from the point of view of the subject Public Administration?** In order to address the need for such reflection as stated in the problem statement, the following research questions, which could lead to the possible solution to the problem statement, are pursued:

- Is a conceptual analysis of TQM as an internal organisational arrangement in the SA Air Force really necessary?
- What TQM dimensions are reported in literature? Can a framework be compiled that clearly integrates the dimensions and distinguishes between primary and supporting dimensions, and why is the TQM dimensions of primary interest for implementing the TQM philosophy at the SA Air Force Bases?
- How does TQM manifest itself in the SA Air Force?
- What proof exists within the SA Air Force that the TQM that has been implemented at air force bases has positively influenced the attitude of personnel with regard to TQM?
- Is TQM an effective management mechanism for the SA Air Force Bases?
- What recommendations can be formulated in respect of the theoretical level (the literature) and empirical level (empirical results)?

## 1.5 OBJECTIVES OF THE STUDY

From the problem statement for the study the aim of this thesis follows, namely to examine the nature and scope of TQM implementation based on a framework, as an internal organisational arrangement for personnel at the SA Air Force Bases. In order to achieve the aim of the study, the objectives of the study in an attempt to solve the research questions, may be structured as follows, namely:

- to provide a conceptual analysis of TQM within the context of organisational theory;
- to provide an appropriate definition for TQM for this study;

- to identify primary and supporting TQM dimensions from the research literature and to integrate these dimensions in a framework that can be used to implement TQM at the SA Air Force Bases;
- to study the primary TQM dimensions individually;
- to study the supporting TQM dimensions individually;
- to introduce the SA Air Force and describe the process followed with regard to the implementation of TQM at the SA Air Force Bases;
- to determine the attitude of personnel at the SA Air Force Bases towards the nature and scope of the primary and supporting TQM implementation dimensions of the literature framework empirically;
- to determine empirically whether personnel members of the SA Air Force Bases find the application of TQM implementation acceptable; and
- to make recommendations and conclusions that can be applied as guidelines with regard to the management of total quality in the SA Air Force in order to bring about improvement and/or implementation of an own, unique TQM implementation framework.

A hypothesis usually follows the formulation of the objectives. The hypothesis formulated for this study will now be discussed in more detail.

## 1.6 HYPOTHESIS

According to Van der Westhuizen (1993:6) the purpose of a hypothesis is, amongst others, to direct and structure the study and to serve as a link between the literature study (theory) and the research (empirical research) and will eventually result in the expansion of knowledge. Coff (1999:119) indicates that previous theory and research suggest that the greater the degree to which a comprehensive set of TQM practices is adopted by an institution, the greater the advantages achieved, and the higher the institution's performance. Therefore, the following hypothesis has been formulated for this study:

*The attitude of personnel of the South African Air Force Bases towards the primary and supporting dimensions of the framework for the implementation of TQM is positive.*

It should be emphasised that the aim of this study is specifically to prove the mentioned hypothesis as being true or untrue at the SA Air Force Bases. Should the attitude of personnel at the SA Air Force Bases be positive in this regard, it would be possible to deduce that the more quality management principles are applied, the better the work performance can be. However, should the attitude of personnel be negative, explanations will have to be found and suggestions be made on how to improve TQM within the SA Air Force Bases. The purpose of the study is therefore to make available empirical data on the success of TQM implementation at the SA Air Force Bases.

The formulation of the hypothesis is usually followed by the research assumptions. The research assumptions for this study will now be referred to in more detail.

## 1.7 RESEARCH ASSUMPTIONS

The following assumptions have been identified in the research process:

- To implement TQM within the SA Air Force Bases, a conceptual analysis within the context of the organisational theory is required.
- To study the primary and supporting TQM dimensions from literature and to integrate the dimensions in a framework will contribute to the determination/evaluation of improved performance at the SA Air Force Bases.
- To determine the nature and scope of TQM as it is applied at the SA Air Force, based on a framework, will assist with the implementation of TQM at the SA Air Force Bases.
- The aim and implications of TQM in the SA Air Force must be conveyed in practice in order to ensure efficient and effective integration in the SA Air Force Bases.
- A new framework to implement TQM at the SA Air Force Bases could improve the efficiency of the SA Air Force.
- It can be accepted that each member of the SA Air Force is service orientated, is aware of the advantage for the SA Air Force should he/she satisfy the needs of customers, is aware of the advantages of the integration of quality principles in management and is aware of the advantages of quality management to improve results.

## 1.8 DEMARCATION OF THE STUDY

The SA Air Force has eight self-accounting, air force bases at various locations in the RSA. Although each base falls under the command of its own officer commanding, the mission, aim, responsibilities and budget of the various bases are similar (HS PLAN/D MAGS/502/1 13 June 1996). Therefore all eight air force bases are used for the purposes of this study, namely air force bases Bloemspruit, Durban, Hoedspruit, Langebaanweg, Louis Trichardt, Overberg, Waterkloof, and Ysterplaat. Owing to the fact that the researcher was a former staff member of air force bases Ysterplaat, Hoedspruit and Overberg (previously called the Test Flight and Development Centre), information sources are readily available for the relevant research. At other air force bases access to information sources and personnel are also readily available due to the senior staff position of the researcher in the SA Air Force.

TQM as internal organisational arrangement falls under the sub-discipline Organisational Science of the subject Public Administration. An analysis of the implementation of TQM at the SA Air Force Bases occurs against this background. TQM within this context is discussed in chapters two and three of this thesis. In chapter 4 special attention is paid to the six primary dimensions of TQM, namely leadership and the commitment of top management to TQM, strategic planning, empowerment, teamwork, continuous improvement and customer/employee satisfaction. The eight supporting dimensions of TQM, namely communication, training, culture, change management, supporting structures, systems and resources, systems thinking and self-assessment, also receive attention in chapter 5. The evaluation is done mainly on the basis of behavioural science aspects and therefore the result is basically a reflection of perceptions.

## 1.9 RESEARCH METHODOLOGY

This study is of contextual interest. Against the background of the problem set out above, the research is conducted in two phases consisting of phase one, a literature study on TQM, supplemented by phase two, a questionnaire. As the empirical study is limited to the input of personnel at SA Air Force Bases, the resulting data and findings are only applicable to SA Air Force Bases.

### 1.9.1 Literature study

As far as the literature study is concerned, a thorough research literature on TQM is done in order to be able to sketch the current position of TQM. The aim of the literature study is to obtain a basic definition for the concept TQM, to identify and study the primary and supporting TQM dimensions in literature and to integrate these dimensions in a framework. The development of such a framework of the primary and supporting TQM dimensions is tested empirically at the eight air force bases by means of a questionnaire, based on the primary and supporting TQM dimensions. Literature in respect of management is also scrutinized for an in-depth study of the various management process models for TQM. The literature study is based on local and international literature on the subject, namely:

- relevant publications and subject policy documents;
- literature lists compiled by the subject librarian at the University of South Africa;
- subject catalogues at various libraries;
- the literature lists included in the various publications obtained; and
- air force publications and policy documents.

The mentioned sources are consulted in order to establish a theoretical framework for TQM. Official documents and files from the Office of the Inspector General of the SA Air Force are also consulted. The literature study provides an orientation to the research already conducted within the field of study, as well as a perspective on the most current research results and findings applicable to TQM and its role in implementation. A cross pollination of ideas and perceptions takes place during the literature study, in that the ideas, views and perceptions, held by various researchers and writers are compared and evaluated, with regard to the concepts concerned. Other researchers will be able to make use of this study due to the exploratory and reconnoitre nature of the study. It will in particular form a valuable basis for further empirical studies, concerning the concepts concerned and the implementation of TQM. In addition, the findings, conclusions and recommendations in this study, may serve as a guide to practitioners on how to implement TQM correctly.

### 1.9.2 Questionnaire survey

As already mentioned, the focus of this study is on the activities of the eight SA Air Force Bases and information obtained from the personnel working at the various bases. The total target population for the research questionnaire at the eight air force bases is 543 people (15% questionnaires to the total manpower of each air force base). Owing to the researcher's involvement with the SA Air Force in the past and the geographical location of the air force bases, it was decided to use a questionnaire.

The data required for the study is collected by means of a structured questionnaire survey. According to Van der Westhuizen (1993:8) structured questionnaires have the following advantages:

- Information can be obtained from a large target population.
- It is an inexpensive way of collecting data and is not time consuming.
- It implies a high degree of anonymity.

According to Claver, Tarí, & Molina (2003:95) a questionnaire is an instrument that is designed for a specific purpose, containing relevant items (questions) to determine the link, cause or result between various aspects/variables in order to determine the current or potential position of matters in respect of the uniqueness of the subject that is examined. Although the use of structured questionnaires to collect data has many advantages, the general low percentage of documents being returned has to be borne in mind (Smit 1978:168). To alleviate this problem, the SA Air Force agreed to a covering letter being sent with the questionnaire stating that the management of the SA Air Force approved the research. It should further be mentioned that confidentiality is emphasised in the covering letter. Follow-up phone calls are made in cases where sufficient feedback was not received from air force bases. This arrangement resulted in a relatively high response (100%) that increases the applicability, validity and reliability of the data (see chapter 7, paragraph 7.3.4).

The questionnaire, based on the theoretical study, is compiled in conjunction with an industrial psychometrist, Mr Chopper Theart. The questionnaire is directed at personnel at all levels at the air force bases. The aim with the questionnaire is to

determine how the concept total quality is currently experienced and understood by personnel members and what total quality dimensions individuals' regard as being important in order to manage quality in the SA Air Force. It can then be determined how total quality is currently experienced in the SA Air Force and how TQM can be improved. The results can then be compared with the organisational theory and the way in which TQM can be described theoretically for military or public institutions. When studying the feedback received, the experience of personnel members with regard to productivity and total quality receives attention. The questionnaires are directed at a representative number of personnel members, at all levels in the organisational structures of the air force bases. In the research certain practical total quality concepts are applied.

Although certain TQM practices may perhaps be unacceptable to the SA Air Force, this does not imply that TQM has no place in the SA Air Force. Special attention is to be paid manner in which certain industrial management practices are accepted. The results thereof, if applicable, are researched thoroughly.

All questionnaires are checked for completeness prior to them be made available for computer processing (including statistical processing). The questionnaires that are returned are used once the completeness thereof is checked. Permission for the study and approval to access the relevant official documents are granted by the General Officer Commanding of the SA Air Force in a letter APSC/R/504/3/1 dated 14 January 2004. The research contained in this thesis is therefore original.

#### 1.9.2.1 Reliability and validity of questionnaires

Scientific research is characterised by two elements, namely validity and reliability. Reliability implies that the same matter that is researched continuously by the same or different persons must render the same results (Van Dyk 1991:275). The questionnaire method complies with this criterion to a satisfactorily extent, but is not infallible as it is impossible to control the environment in which the questionnaire is answered. The mood of the respondent may for example influence his/her responses. Such environmental factors also have an influence on other research methods.

The second characteristic of scientific research, namely validity, implies that the research should be able to measure that which it is suppose to measure (Van Dyk 1991:277). All reasonable measures are taken to ensure the internal validity of the research. Leading questions are avoided and the wording of questions is simple and unambiguous. The questionnaire is also designed in such a manner that it can be completed simply and accurately. Control questions are also added in order to determine whether respondents are contradicting themselves. The division, distribution and handling of the questionnaire, as well as the reason why a representative test check is used rather than having all personnel at the air force bases complete the questionnaire, are discussed in more detail in chapter 7, paragraph 7.3.4 of this thesis.

## 1.10 REFERENCE TECHNIQUE

In this thesis reference to sources is done according to the Harvard method, which implies the use of the author's surname, followed by the year in which the source was published, as well as the applicable page number. Where the date is normally omitted in the second and further references in the same paragraph, it is, however, repeated in this thesis as some of the sources were compiled by the same author, but refers to different publications (where for example more than one publication is under discussion). (Palmer 1998:13.)

Where more than one quotation from one source appears in the same paragraph (as in the previous paragraph), a full stop is used at the end of the sentence as well as a full stop after the page number within the closing bracket. To facilitate readability of the thesis, the use of footnotes is limited. A footnote is not used for reference purposes, but rather to provide more detail in respect of the contents. A full list of references, listed alphabetically according to the surname of the author, is used. The abbreviations and terms used in this thesis or referred to will now be discussed in more detail.

## 1.11 TERMINOLOGY

In light of the fact that diverse meanings are sometimes attributed to specific terms, it is essential to define terms peculiar to the SA Air Force that are used continuously in this thesis. Although the users thereof already know these terms and abbreviations, the

purpose of this paragraph 1.11 is to familiarise the reader who is not necessarily a user, with such terms and abbreviations. In this way it can be ensured that points of view and arguments are meaningful. Other terms will be defined at the place where they are used for the first time in this thesis.

The abbreviations will be referred first.

### 1.11.1 Abbreviations

| | | |
|---|---|---|
| SANDF | - | South African National Defence Force |
| SA Air Force | - | South African Air Force |
| TFDC | - | Test Flying and Development Centre |
| EFQM | - | European Foundation for Quality Management |
| DMS | - | Directorate Management Services |
| NPI | - | National Productivity Institute |
| SAEF | - | South African Excellence Foundation |
| SA Air Force Bases | - | South African Air Force Bases |
| TQM | - | Total Quality Management |

### 1.11.2 List of terms

The following terms utilised throughout the thesis and peculiar to the SA Air Force are defined below.

#### 1.11.2.1 Division

A division is the primary component of a branched organisation structure (Allen 1979:5). Division implies the personnel, finances, operations, intelligence, security, base support and air servicing required for a specific purpose. It renders a staff or domestic service to the main activities of the air force base (Palmer 1998:15). A division falls under the command of a lieutenant colonel (assistant director).

#### 1.11.2.2 Facilities

These include all permanent or semi-permanent facility needs, such as terrain, buildings, structures, location, space, environmental requirements and improvements, as required for the support of the equipment over the total lifecycle of such equipment.

#### 1.11.2.3 Air force base

An air force base has a runway and aircraft and consists of divisions and self-accounting units (Palmer 1998:16). The officer commanding of a base holds the rank of brigadier general (director) or colonel (deputy director). The base officer commanding is responsible for the entire base as far as personnel, finances, operations, intelligence, security, base support and air servicing are concerned.

#### 1.11.2.4 Self-accounting base

In SANDF context it implies a base with limited accounting status. Accountability is usually limited to the management and accounting of service equipment such as aircraft spares. Other services and domestic arrangements are usually provided by the various divisions at the base (Palmer 1998:15).

#### 1.11.2.5 Product support supplier

Product support supplier implies any private company that provides contractual support to the SA Air Force through the maintenance of aircraft or ground systems[3], as well as the provisioning of spares. Companies such as African Defence Industries, Denel Aviation, Overberg Test Range and Grintek serve as examples (Palmer 1998:14).

#### 1.11.2.6 Top management, middle management, low level management

Top management provides guidance and usually consists of the board of directors, the chief director and a number of assistant or deputy chief directors who jointly form the management committee. Top management is responsible for the management of the

[3] A system that does not form part of an aircraft system.

institution as a whole, that is to plan, organise, activate and control the activities of the institution, with due consideration for the tendencies in the environment. The top management (operational, logistic, base support, finances, intelligence, security and personnel) at air force bases include the officer commanding (brigadier general or colonel) and the seven heads of department, that is the operational, air servicing, intelligence, base support, financial, security and personnel heads). They usually hold the rank of colonel or lieutenant colonel.

Middle management includes divisional heads and section heads (personnel, finances, operations, intelligence, security, base support and air servicing). They occupy the ranks of warrant officers to majors. They provide intermediate guidance and are responsible for the functional or subdivisions. At this level managers are to ensure that the objectives of their departments are achieved and that institutional and functional policy is adhered to.

Low level management provides basic guidance and is responsible for the smaller components or subdivisions in an institution. Their task is to execute the objectives of middle management with the aid of detailed plans. For purposes of this research the focus will be on top management, middle management and the workers. (In the empirical analysis the category of low-level management is referred to as the workers as this specific category include both the low level managers and the operational workers of whom the latter do not occupy management positions.)

## 1.12 EXPECTED CONTRIBUTION TO EXISTING KNOWLEDGE

The conceptual analysis of TQM in chapter 2 and knowledge of the relationships between the primary dimensions, as set out in chapter 4, namely leadership and the commitment of top management to TQM, strategic planning, empowerment, teamwork, continuous improvement and customer/employee satisfaction and the supporting dimensions, as set out in chapter 5, namely communication, training, culture forming, change management, supporting structures, systems and resources, systems thinking self-assessment and resources should all contribute to a better understanding of TQM in respect of institutional improvement in the SA Air Force. The literature study is therefore multi-disciplinary and extensive in nature, covering 14 individual dimensions

(see chapter 3 to 5) to ensure a thorough understanding of the concepts concerned and to determine the influence of these 14 dimensions on the formulation of a TQM implementation framework.

The establishment of a TQM implementation framework (based on the literature) may be used to evaluate the necessity for and success achieved with the implementation of TQM, and should assist the SA Air Force to establish and/or improve their own TQM programmes. The framework is empirically tested and important conclusions are made within this framework. Recommendations in respect of the nature and value of such a framework for TQM in general are made. Specific conclusions are reached and recommendations made on aspects relating to such an approach at the eight SA Air Force Bases. The value of this study therefore lies at a theoretical as well as at a practical level.

At theoretical level the framework can serve as a guideline for research on the management of TQM as well as the teaching of students on this subject of the management science. The findings of the empirical study on the practice of TQM in the SA Air Force lead to various guidelines that can be applied by the SA Air Force and other public institutions to manage TQM. In this way a contribution is made to the aspirations of the SA Air Force to continue to exist successfully as part of the SANDF. It is believed that this literature and empirical research will help to bring to the attention of researchers the importance of the development of TQM theory and the identified dimensions.

## 1.13 EXPOSITION OF CHAPTERS

On completion of the research and after collecting the necessary data, the material collected are integrated and coordinated so that the facts and observations can speak for themselves. A thematic approach is followed throughout and results are divided into the following chapters (see figure 1.1 on the procedure to develop a framework for TQM and figure 1.2 for the structure of the study), namely:

- **Chapter 1** serves as an orientation and background study to the thesis. The reason for the study and the objectives of the study are discussed in this

chapter. In the last instance the method of research, reference technique and abbreviations and terms used in the thesis are discussed.

- In **chapter 2** the theoretical background to the study are discussed that includes a literature review of the nature and scope as well as self-assessment models of TQM. The definitions of TQM are also discussed.

- In **chapter 3** a further theoretical background to the study are discussed which includes a literature review for the identification of the primary and supporting dimensions of TQM (see figure 1.1 for the procedure followed to determine primary and supporting dimensions). From the identified primary and supporting dimensions of TQM a total quality framework are presented that can serve as a framework for the SA Air Force. Assumptions of the TQM framework are provided to give more construction to the total quality framework as explained in figure 3.1 (see chapter 3, paragraph 3.4.1 and 3.4.2).

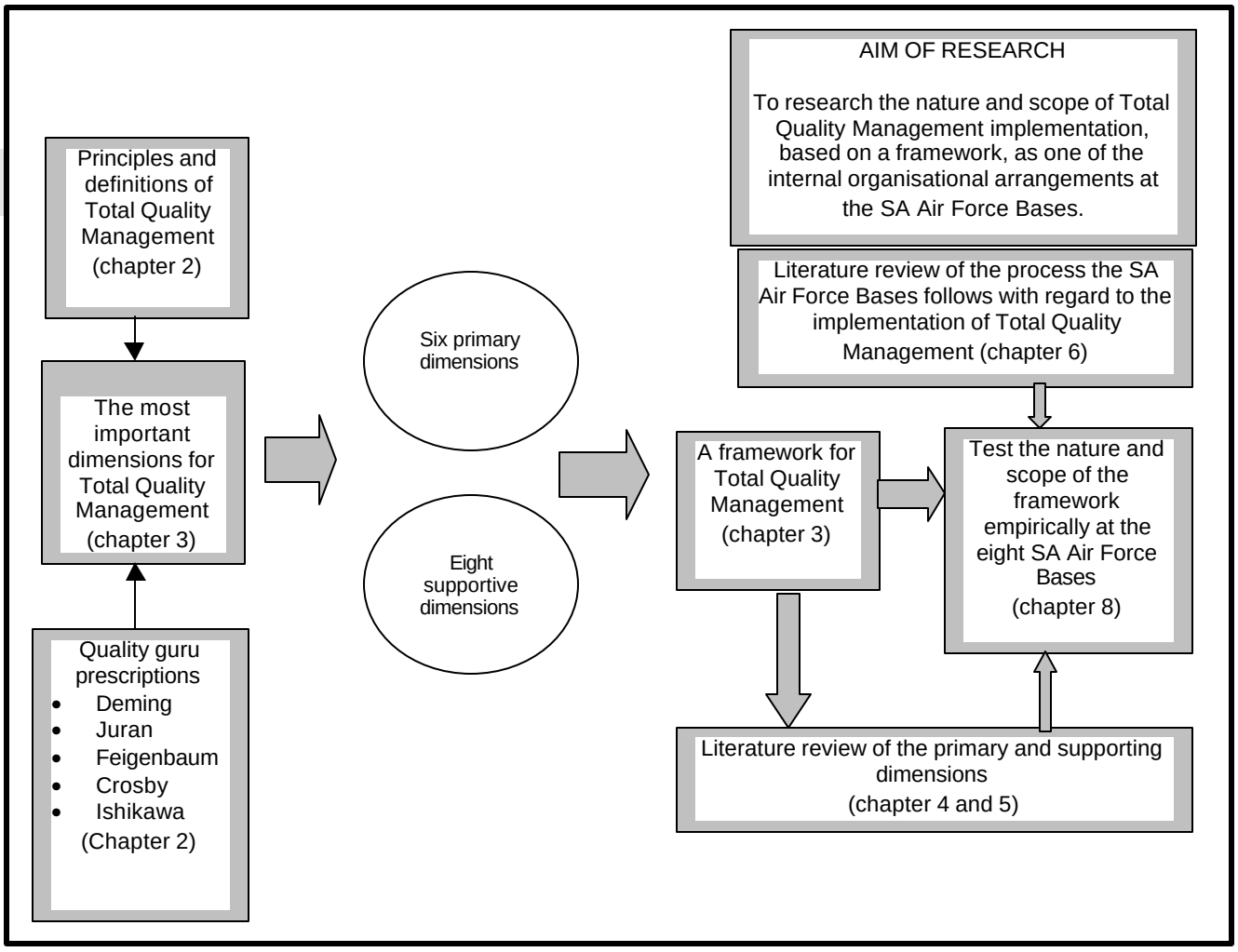
- In **chapter 4** the six primary dimensions are discussed. The aim of this chapter is also to introduce the reader to these dimensions.

- In **chapter 5** the eight supporting dimensions are discussed. The aim of this chapter is also to introduce the reader to these dimensions.

- **Chapter 6** contains a brief description of the process followed by the SA Air Force Bases to implement TQM.

- The data collecting methodology regarding TQM at the SA Air Force Bases is discussed in detail in **chapter 7**. The questionnaire used to collect data is also discussed in more detail. The analysis and interpretation of this data are discussed in **chapter 8**.

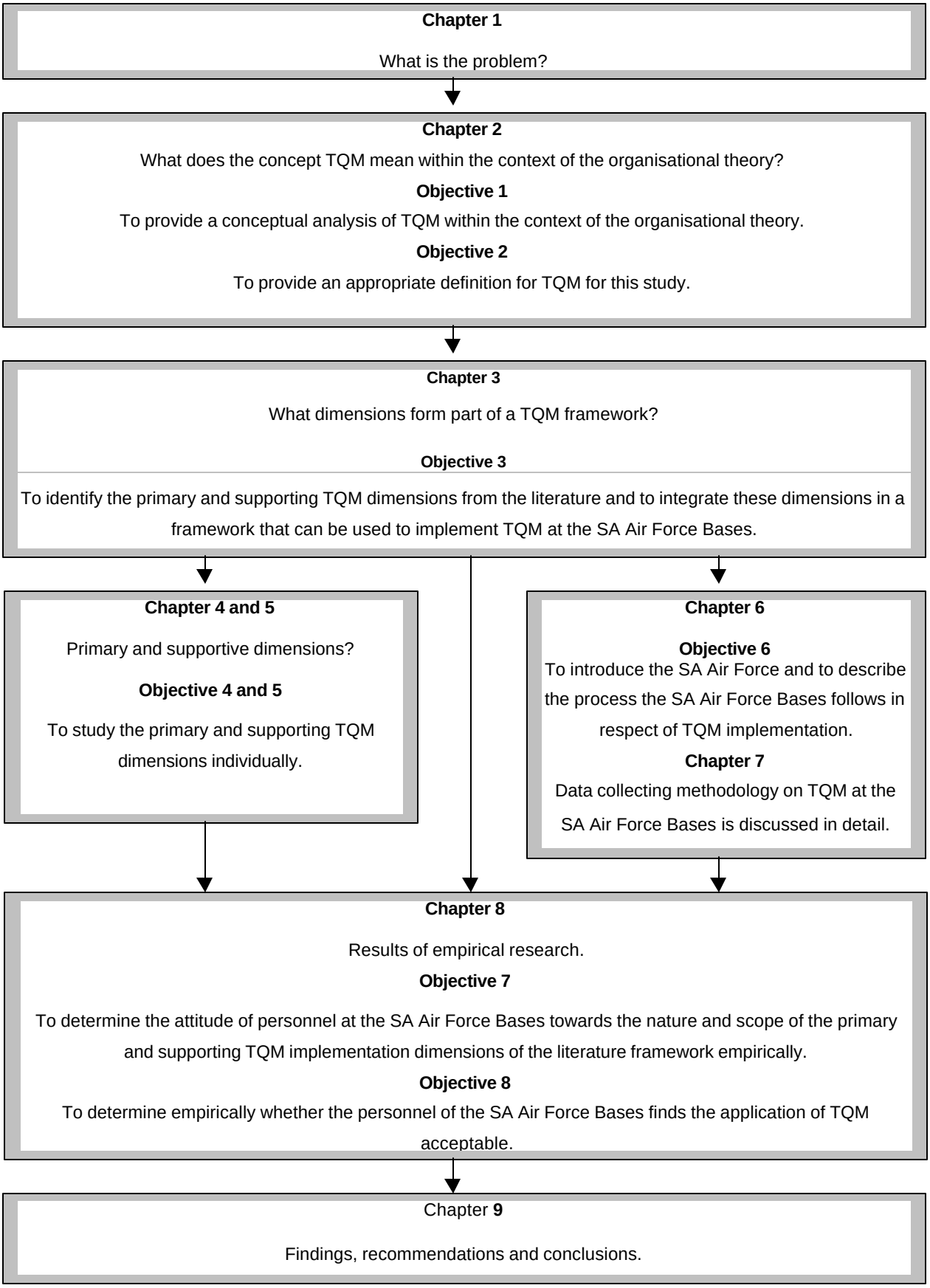
Figure 1.1: Procedure followed to develop a framework for TQM




Source: Own observation

**Chapter 9** contains a summary of chapters 2 to 8 and contains the most important findings and recommendations as well as the conclusion reached in respect of the research question. Recommendations in respect of further research on TQM are also made.

Figure 1.2: Structure of the study



## 1.14 SUMMARY

This chapter aimed to provide the backdrop against which the research reported in this thesis was conducted. It therefore provided reasons for undertaking the research in the form of the problem statement, study objectives, hypothesis, research assumptions and a demarcation of the extent of the study. It also outlined tools for the reader of the thesis in the form of an explanation of the research methodology, the reference technique, an explanation of the meaning of terms used throughout the thesis, as well as an exposition of the further chapters that make up this study. An attempt was also made to identify the contribution this study could make to the existing knowledge about the subject of Total Quality Management.

The successful management of total quality enjoys high priority in the SA Air Force. It is therefore essential to measure the nature and scope of TQM as an internal organisational arrangement for personnel in the SA Air Force. This should determine whether the process is viable and whether it can be implemented successfully in the long term. However, to achieve this analysis, it is necessary to consider the concept of Total Quality Management by examining the available literature dealing with the concept and its international application, as will be done in the following chapter.