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Investigating the Feasibility of establishing an Enterprise-Project Management Office (E-PMO) in a Military Organisation: The South African Context

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A Research Project submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, in fulfilment of the requirements for the degree of Master of Science in the field of Industrial Engineering.

Submission Date: 24 November 2021

Declaration

University of the Witwatersrand, Johannesburg

School of Mechanical, Industrial and Aeronautical Engineering

SENATE PLAGIARISM POLICY

I, 398831, Mulalo Vivian Mnisi, declare that this Thesis/Research Report is my own, unaided work. It is being submitted for the Degree of MScs Industrial Engineering at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



(Signature of candidate)

24 day of **November 2021** in **Montana Pretoria.**

Abstract

The Project Management Office (PMO) can represent different acronyms interchangeably or all of them simultaneously, depending on its primary focus area. The main purpose of a PMO is to ensure a consistent approach to all projects within the organisation. Many challenges face the traditional PMOs, and organisations are now seeking business solutions to address these issues. The PMOs at a departmental or unit level have delivered value to organisations. However, every organisation should desire to progress from a traditional PMO to an Enterprise-PMO (EPMO) to realise the ultimate value of the EPMO. This study investigated the feasibility of establishing an EPMO for a military organisation. A literature review on the PMO and Defence Acquisition System (DMS) was conducted. Furthermore, interviews were conducted with Defence Project Officers. A comparison of the reviewed literature and data collected from interviews was made to draw the research findings. These findings were discussed and suggested opportunities for improvement were given to the military organisation.

Keywords:

Enterprise Project Management Office; Project Management in the Defence Force; Defence Acquisition Process

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Acronyms and abbreviations

AA	Acquisition Plan
AAC	Armaments Acquisition Council
AACB	Armament Acquisition Control Board
AMSCOR	Armaments Corporation of South Africa
AoA	Analysis of Alternatives
AP	Acquisition Plan
AS	Acquisition Study
CADMID	Cycle, Assessment, Demonstration, Manufacture, In-service and Disposal
CADMIT	Cycle, Assessment, Demonstration, Manufacture, In-service and termination
CDD	Capability Development Document
CM	Capability Manager
CSF	Critical Success Factors
CSLC	Capability System Life-Cycle
DAP	Defence Acquisition Process
DAP	Defence Acquisition Policy
DAS	Defence Acquisition System
DLoDs	Defence Line of Development
DMD	Defence Materiel Division
DoD	Department of Defence
DP	Developmental Plan
DS	Developmental Study
EMD	Engineering and Manufacturing Development
EPMO	Enterprise Project Management Office
FIC	Fundamental Input to Capability
FRP	Full Range Production
FS	Functional Study
GOC	General Officer Commanding
IC	Investment Committee
ICD	Initial Capability Document
IGBC	Initial Gate Business Case

IPT	Integrated Project/Product Team
IPT	The Integrated Project/Product Team
JCIDS	Joint Capabilities Integration Development System
JROC	Joint Requirement Oversight Council
MDD	Material Development Decision
MGBC	Main Gate Business Case
MoD	Ministry of Defence
MSA	Material Solution Analysis
NSC	National Security Committee
OIL	Organisation, Infrastructure and Logistics
OSC	Operational Staff Council
PCR	Project Closure Report
PD	Production and Deployment
PDR	Preliminary Design Review
PM	Programme Manager
PMBOK	Project Management Body of Knowledge
PMO	Project Management Office
PMSG	Project Management Stakeholder Group
PO	Project Office/Project Office
PPBE	Planning Programming Budgeting and Execution
PR	Project Realisation
PRM	Project Realisation Manager
PS	Project Study
PSR	Project Study Report
RDP	Release Decision Point
ROC	Required Operational Capability
SANDF	South African Defence Force
SMART	Specific, Measurable, Attainable, Relevant and Time-based
SRD	System Requirement Document
ST	Staff Target
TEPIDOI	Training, Equipment, Personnel, Information, Concept and Doctrine,

TMRR	Technology Maturity and Risk Reduction
URD	User Requirements Document

CHAPTER 1
INTRODUCTION

1.1 Introduction

It is undeniable that traditional PMOs have delivered some value and, thereby, assisted the organisations in delivering projects. However, in recent years, traditional PMOs face many challenges and organisations are now seeking business solutions to address these problems (Rathore, 2010). Okereke (2020) agrees that PMOs are experiencing challenges regarding the misunderstanding of accountability levels, lack of coordination, and poor integration of knowledge, processes and capacity. The problems facing the PMOs are poor execution of projects and ineffectual coordination of organisational resources and facilities, which have resulted in an escalation of costs (Newbry & Krikke, 2016).

Organisations are now finding ways to improve the functioning of the PMO to remedy its limitations. Therefore, according to various reviewed studies, creating an EPMO is a possible solution for these prevailing challenges (Newbry & Krikke, 2016; Rathore, 2010). Crawford (2010) acknowledges the value of traditional PMOs at a departmental or unit level. However, his work suggests that every organisation should desire to progress from a traditional PMO to an EPMO to realise the ultimate value of the PMO.

The PMO should advance through the maturity levels from the traditional PMO to an EPMO (Philmlee, 2019). Selepe (2019) argues that this progress seems to be a logical and natural step in fostering efficiency in project management within the public sector. Therefore, this claim implies that an EPMO establishment occurs naturally from the already existing PMO infrastructure at departmental or regional level (Oracle, 2010). Philbin (2016) believes that the already existing capacity of project management is built upon. This process is often the best way of establishing an EPMO since there must be synergy and reporting lines between traditional PMOs and an EPMO (Giraudo & Monaldi, 2015).

1.2 Enterprise-PMO

Although Enterprise-PMO (EPMO) is not always a remedy for solving the PMO's challenges, it seems to have alleviated most of them. Therefore, EPMO's creation signifies a strategic approach to project management, whereby decisions concerning all organisational projects are taken centrally (Richards & Jackson, 2019). Metuge (2014) concludes that EPMO brings about the required coordination, cooperation and support among the different departmental projects and creates harmony between all the organisation's projects. In a similar study within the public sector, Selepe (2019) found that an EPMO provides the desired coordination among the PMOs located in different geographical areas.

1.3 Purpose of the study

The purpose of this study is to examine the practicality of establishing the EPMO within the South African military organisation.

1.4 South African Defence Project Management Office Context

The South African Department of Defence (DoD) consists of the South African National Defence Force (SANDF) and Defence Secretariat (Department of Defence, 2015). The SANDF has various Arms of Service, namely the South African Army, South African Air Force, South African Navy and South African Military Health Services, and various support divisions as shown in Figure 1 below and outlined in more detail in Appendix A.

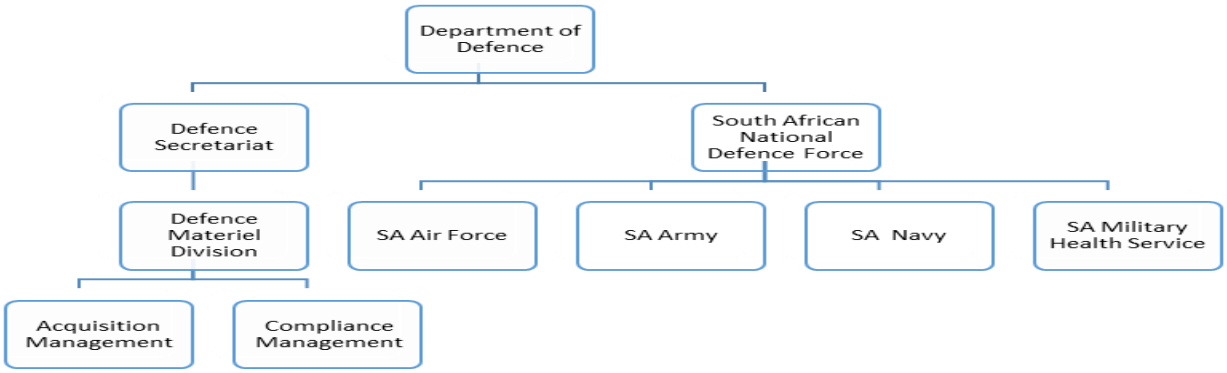


Figure 1: Department of Defence Structure (Department of Defence, 2019)

The Defence Materiel Division (DMD) is responsible for administrating all acquisitions for the Chief of the SANDF (Department of Defence, 2019). The DMD has two chief directorates,

namely Acquisition Management and Compliance Management. Acquisition Management primarily deals with all military acquisition projects of armament systems (Armscor, 2019). Furthermore, the Acquisition Management has four directorates that focus specifically on a specific Arms of Service, for example, Directorate Naval Acquisition focuses specifically on assisting the SA Navy in managing its acquisition projects. Each directorate functions independently and focuses (plans and executes) on its acquisition projects (Theletsane, 2018).
The Acquisition Management has PMOs that are staffed and located in the Arms of Service that function independently. Under each Arm of Service, the PMOs are situated in different locations across the country. The South African Military Health Services and Divisions have no specific PMO, however, they co-opt individual employees to the project whenever a project's requirement exists under the Directorate Common Weapons. Each Arm of Service is responsible for the appointment and management of its PMO staff members. Acquisition Management provides initial project management training and policy framework. Simultaneously, the Arms of Service are responsible for any further training and development necessary for their staff's effectiveness and the PMO (Department of Defence, 2019). The PMOs of the various Service divisions work in isolation; thus, there are no benefits of joint PMOs (Department of Defence, 2019). The military organisation lacks a communication platform that can share processes, procedures, best practices, research and development, as well as other resources that may help PMOs to be more effective, as cited in various project management literature (Kerzner, 2018).

The SANDF, by design, requires all the various Arms of Service to work jointly to support and coordinate projects in order to achieve its overall objectives (Olivier, 2015). Therefore, the lack of coordination and integration of the PMOs often manifests itself during joint operations. It becomes evident that the individual Service divisions are not integrated (Thaba & Siebert, 2015).

Acquisition projects require the coordination and cooperation of several organisations, such as a client, acquisition agency and suppliers of armaments. The functions and interactions of these organisations, which are commonly referred to as the 'inseparable partners' (Armscor, 2016) in the entire acquisition process, are detailed in Figure 2 below (DAP 1000):

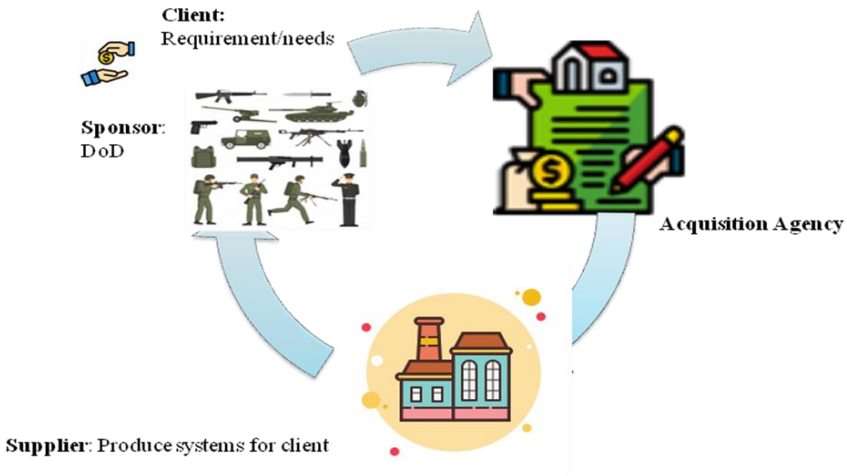


Figure 2: Relationship between the Client, Acquisition Agent and Supplier (Author's own illustration).

1.5 Problem Statement/Motivation

The PMOs under study within the military organisation's different Arms of Service use the Defence Acquisition Policy (DAP 1000) that prescribes the acquisition process. The various PMOs, however, function in isolation and seem to apply the policy differently and do not share project-related resources and project management best practices. Furthermore, these PMOs have no formal communication protocol when initiating or undertaking projects. As such, the acquired systems and armaments are at risk of not being compatible with the already existing system within the various sections of the Arms of Service. The South African military needs a joint operation capability even at project execution level to ensure coordination of land, air, sea, information and space decisions and projects (Department of Defence, 2015).

According to Garrett and Rene (2007) defence equipment developed independently by one Service often failed to operate successfully within other Services during joint manoeuvres. The various Arms of Service often discover that their systems or armaments are not entirely compatible during these joint operations. In addition to these challenges, there are instances whereby the Arms of Service acquire completely different systems for the same purpose. The separately acquired systems often cause integration challenges to the full system functionality required during joint exercises (Department of Defence, 2012). The Services' autonomy and lack of cooperation in defence programmes often lead to duplication of programmes, lack of jointness

of effort (In this study, the term cohesion will be used to represent the military term jointness of effort) and inter-operability (Garrett & Rene, 2007). The current method of managing projects has resulted in a certain degree of overlapping of efforts. This study investigates the feasibility of establishing an EPMO to address the challenges that arise due to lack of joint operation at the project execution level to foster PMO integration and project execution alignment for the various Arms of Service. An EPMO can help defence organisations harness cost-related efficiencies and stakeholder satisfaction amongst several other resultant multiplier benefits (Andrews, 2014; Rathore, 2010). Ramani (2016), asserts that implementing an EPMO is not a simple task. The author however agrees that establishing EPMO can solve the problem of disjointed operations, multiple challenges stemming from the organisation's lack of readiness for culture-changing within the top management's approach and the organisation's degree of maturity.

1.6 Critical Research Question

The primary research question is as follows:

> *What is the feasibility of establishing* an *Enterprise-PMO in a military organisation to aid acquisition management within projects' delivery?*

1.7 Research Objectives

To answer the research question, the project objectives are:

i. To determine project management processes within each PMO during acquisition management within the military organisation.
ii. To establish the building blocks that should be in place for implementing an EPMO.
iii. To determine the readiness level of the military organisation for establishing an EPMO.

1.8 Scope and Delimitation of Study

This research was conducted within South Africa's military organisation. The study was limited to the DMD and Services' PMOs involved in acquisition projects. The sample population involved in this study was drawn from this military organisation. The research includes gathering information from programme managers, project managers and all other staff involved in the acquisition projects and selected to make up the sample size. Therefore, the study's findings are confined to the SA Military Organisation and not to all military organisations.

1.9 Structure of Research

The outline of the final research report will be as follows:

- *Chapter 1* – **Introduction**: This chapter provides the research background and context, problem statement, critical research, objectives, and the scope and delimitation of the study.
- *Chapter 2* – **Literature Review:** This chapter presents, and reviews related literature to gain insight from current knowledge, relevant theories for building frameworks to answer the critical research question.
- *Chapter 3* – **Research Methodology:** This chapter discusses the approach to answer the central research question and achieve the objectives delineated in Chapter 1, guided by the research roadmap presented in Figure 3.
- *Chapter 4* – **Results and Analysis**: This chapter presents the findings from the collected data – illustrated using different presentation tools: tables, charts and bullets, as required.
- *Chapter 5* – **Discussion:** This chapter discusses the findings using the reviewed literature to make analysis and deductions.
- *Chapter 6*– **Conclusions and Recommendations**: This chapter draws conclusions related to the research objectives and outlines key recommendations and areas for future research.

1.10 Conclusion

Chapter one consisted of an introduction and a brief overview of the PMO. The military organisation's project management and acquisition process were explained. Moreover, this chapter outlined the problem statement, purpose, study question, objectives, and limitations of the study.

CHAPTER 2
LITERATURE REVIEW

2.1 Defence Acquisition

Globally, decisions relating to military acquisitions are taken with an understanding that the Service and divisions within the organisation can identify an appropriate system to address a specific, well-defined requirement (National Research Council, 2010). Furthermore, the Defence Acquisition Process (DAP) has become complex and has not always produced systems that meet the expected costs or required performance (Darrin & Stadter, 2017). Due to the costs associated with the DAP, such an endeavour's success is imperative to the government and its fiscus (National Treasurer ,2019).

According to Schwartz (2014, p. i), acquisition is a general term used to refer to the procurement of goods and services. This procurement process is "*the design, engineering, construction, testing, deployment, sustainment, and disposal of weapons or related items purchased from a contractor*". According to Schlomer and Campbell (2018), this definition is also applicable to defence acquisition, emphasising weapons and related items. Brown (2010) concurs that Defence Acquisition Policy covers all aspects of design, engineering, test and evaluation, manufacturing, operation and defence capability support. In addition to all these facets, Kendall (2017) believes that acquisition also includes programme management. The acquisition process is the system through which the DOD, in collaboration with the defence industry, furnishes the supplies required by a military system to meet current and future military operations (Moore & Antill, 2013). This study will adopt the definition of the DAP as acquiring weapons and related items involving the design, engineering, test and evaluation, manufacturing, and operation and support of defence capability. The next section will present a deeper understanding of the DAP.

2.1.1 The international perspective on Defence Acquisition Process

The acquisition of military weapons and related services occurs through a series of steps, otherwise known as the DAP. This process differs from country to country and is tailored by the relevant country's DoD's policies and instructions. According to Erenel and Eren (2018) and Schwartz (2014), the DAP is highly complex and technical. The DAP involves establishing and understanding the context in which the people, technology and materials are jointly deployed in

pursuit of the country's political and societal goals (Jenkin, 2015). This process converts military needs and available technologies into existing military weapon systems (Serafini, 2017). Therefore, DAP involves tasks performed in preparation for the initial programme and then from the initiation to the disposal/decommissioning of the system (Ryan & Soutberg, 2018). The next section will compare the United States (US) DoD's Acquisition system, Australian DAP and United Kingdom (UK) Mod Acquisition model and utilise them as a global view of the DoD's DAS. These countries were chosen because of the readily available literature on their DAPs as well as the English language compatibility with the language of the study.

When reviewing the literature on global defence acquisition, the obvious challenge is that each country's process is tailored to meet its political, governmental, and societal needs. Although there are similarities within the countries' acquisition systems due to the US's influence, there are also differences. Therefore, for the purposes of this study, the researcher will review three countries' DAPs. The researcher believes that doing so will provide a global overview of the acquisition processes.

2.1.1.1 The USA Defence Acquisition System

The United States DAS is a foundation of the global DAP (Kumar, 2013). This process has undergone significant reform since the initial Requirement Generations System's 'bottom-up' development process. The 'bottom-up' approach driven by the service-initiated requirements lacked commonality, inter-operability and jointness. This approach was characterised by "*parochialism, arrogance and competitive infighting*" (Garrett & Rene, 2007, p. 16) and, thus, was ineffective because it lacked the much-needed cooperation between the Arms of Service. These flaws hampered the desired culture of jointness, inter-service cooperation and inter-operability. To remedy these shortcomings, a new ground-breaking process, based on the 'top-down' and capacity-driven process, was introduced in 2003. The Arms of Service' unique requirement development process was replaced by the Joint Requirements Oversight Council (JROC) and Unified Commanders in Chief's (CINC) participation. This change aimed to authenticate the capability requirements, eliminate duplication amongst the Services' programmes, and ensure jointness and inter-operability (Garrett & Rene, 2007).

The US DoD's acquisition system has three different but interrelated processes, including the Joint Capabilities Integration Development System (JCIDS), the Planning, Programming, Budgeting and Execution process (PPBE), and the DAS as prescribed by the DoD 5000 series of instructions (Colombi & Kwirthlin, 2014). Although these three processes are separate, they continue from one to the next interactively and are progressively directed by the schedule and events (Worger *et al*., 2016). The use of the JROC and Unified Commander in Chief's participation replaced the bottom-up materiel requirement system with a capability-driven, top-down process (Garrett & Rene, 2007).

According to DoD Instruction 500.02 (2020), the acquisition framework has six different acquisition pathways: Urgent Capability Acquisition, Middle Tier of Acquisition, Major Capability Acquisition, Software Acquisition Defence Business Systems and Acquisition of Services. Therefore, the acquisition of capability follows a specific pathway depending on the type of goods or services acquired. For this study, only the Major Capability Acquisition pathway will be reviewed as per Figure 3 below.

Before entering the acquisition process, capacity requirements are dealt with through the JCIDS process, which is responsible for identifying the US armed forces' capability needs in support of the National Security Strategy, National Defence Strategy and National Military Strategy. JCIDS supports the JROC and Chairman of Joint Chiefs of Staff to identify, assess, validate and prioritise the capability requirements. JROC consists of Service Vice-chiefs and Assistant Commandant of the Marine Corps and is managed by a small permanent staff. JROC oversees the material requirement documentation validation process and emphasises cohesion in requirement generation for all major defence acquisition programmes. Furthermore, the PPBE process is responsible for ensuring that the defence plans and programmes meet the National Security Strategy's needs within the available and often limited budget, as shown in Figure **3** below, (Defence Acquisition Guidebook, 2011).

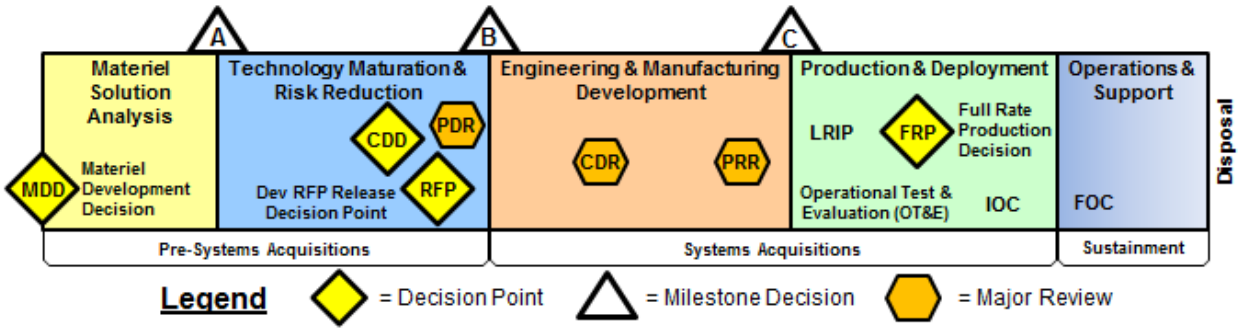


Figure 3: Major Capability Acquisition DoD Instruction 500.02 (2020)

Major Capability Acquisition has a life-cycle process with a "*period called phases separated by decision points called milestones. Some phases are divided into two efforts separated by program*[me] *reviews*" (Brown, 2010, p. 41). The life-cycle process subjects the programme to various practices such as determining needs, research and development, production, deployment, support, upgrade and demilitarisation and disposal.

The entry point of the acquisition process is the Material Development Decision (MDD). At this decision point, the Initial Capability Document (ICD) and Analysis of Alternatives (AoA) are required to inform the first phase of the acquisition process. At the MDD, the primary focus is on establishing the estimated costs associated with logistics, sustainability and analysis of the capability requirements. (1) The Material Solution Analysis Phase (MSA): this phase focuses on identifying and assessing the costs of potential alternative solutions to meet the specified operational requirement and the risks associated with these solutions. A preliminary acquisition strategy, technology development strategy, AoA, Capability Development Document (CDD) and System Engineering Plan are developed. During this phase, all possible solutions are considered, and the best option for the required material or service is selected. This process (Milestone A) is completed before any other action is taken. If approved, the requirement programmes move on from Milestone A to the Technology Maturation and Risk Reduction Phase (TMRR) (Schwartz, 2014).

(2) The TMRR Phase: The Programme Manager (PM) assesses the suitability of the material solution regarding its operation and inter-operability. This phase concerns risk reduction in terms of technology, engineering integration, life-cycle cost, and sustainability to determine the appropriate set of technologies to be integrated into a full system. The PM ensures that

prototypes are developed and demonstrated to reduce technical risk and confirms their design, costs and requirements (Manning, 2020). Furthermore, the PM is responsible for ensuring that the Preliminary Design Review (PDR) is linked with the system performance specifications and that the CDD is aligned with the requirements for the system performance. The Release Decision Point (RDP) satisfies the product support planning, setting up of contracts and design specifications of those critical elements to the delivery of capability [and] its provide product support. The acquisition executives approve the Life-cycle Sustainable Plan before Milestone B. Milestone B is the most critical milestone in the process because it commits the DoD to a specific product, costs, schedule, suppliers, terms of the contract and subsequent production of the system (Defence Acquisition Guidebook, 2011).

(3) The Engineering and Manufacturing Development Phase (EMD): According to Manning (2020), the primary focus of this phase is the development, design and integration of the system that will move into the production phase. Also, the PM performs a Critical Design Review to evaluate the system's capability and features against the CDD. The PM also conducts a Production Readiness Review to assess the capacity of the production processes and facilities to meet the requirements. The finalisation of the designs of the product by the PM is approved as Milestone C (Defence Acquisition University, 2011).

(4) The Production and Deployment Phase (PD): during the PD Phase, the process moves from planning to execution. The chosen system for the identified operational requirement is produced and deployed. The PM assesses its readiness and capacity to support the operation, as well as the logistical support. The Full-Rate Production Decision grants authority for the programme to enter Full-Range Production (FRP). The FRP serves to assess the manufacturing processes, performance, reliability, and sustainable support for the system (Defence Acquisition University, 2011). The Operations and Support Major Capability Acquisition encompasses a life-cycle process that has *"period called phases separated by decision points called milestones. Some phases are divided into two efforts, separated by program*[me] *reviews"* (Brown, 2010, p. 41). The life-cycle procedures include the following stages: determining needs, research and development, production, deployment, support, upgrade, demilitarisation and disposal (Brown, 2010).

(5) The Operations and Support Phase (O and S): This phase results from proper planning and execution. The PM focuses on training, system performance and effectiveness, plus the cost of supporting it (Defence Acquisition University, 2011).

The US DoD has a structured acquisition process that analyses, designs, develops, integrates, tests, evaluates, produces and supports the approach. The procedure's main objective is to support the defence acquisition programme of systems and other complex acquisitions. These acquisition processes are tailored for specific products, depending on the programme size, complexity, risk, urgency and other factors (United State Department of Defense, 2020).

Sullivan (2011) has criticised the US DoD because it has not adopted the portfolio management approach in relation to the capability investment which would allow for the integration and prioritisation of capability and resources to eliminate duplication. The author argues that JROC has not fulfilled its responsibility but has left the prioritisation and decisions pertaining to defence capability to the services, even though it is well placed to have a joint perspective when reviewing the entire DoD to ensure proficiencies and eliminate wastage. This criticism seems to be justified because Francis (2009) asserts that if the capacity requirements and investment decisions are based on services and individual platforms, the DoD cannot adequately deal with the issue of ensuring the jointness of effort. Sullivan (2011, p.g 3) agrees with the assertion that "*service-driven requirements and funding processes*" will always hamper effective cohesion and result in an undesirable duplication of requirements. A report to the Congregational Committees by the USA Government Accountability Office on the DoD's Weapon System requirements found that although the JROC has a joint perspective to review the entire department to ensure interconnection, prioritisation of requirements and elimination of inefficiencies and potential redundancies. it has failed to fulfil its mandate adequately (United State Government Accountable Office, 2011).

2.1.1.2 United Kingdom Ministry of Defence Acquisition

Taylor (2020) asserts that the UK Ministry of Defence (MoD) manages acquisition in terms of the programme, which collates similar projects, rather than working on a single project. Through the Specific, Measurable, Attainable, Relevant and Time-based (SMART) acquisition system,

the UK method focuses on the life-cycle approach rather than on obtaining resources through the initial purchase (Brooke-Holland, 2019). This SMART approach emphasizes system engineering and the entire life of the weapon system when managing defence capacity. This holistic approach commences with identifying the capacity gap and continues until the disposal of the equipment's on completion of its end-of-life cycle. It includes considering the total cost of the equipment throughout its life-cycle so that investment decisions are made based on the equipment's lifespan including "operating, supporting, maintaining and finally disposing of equipment" (Ekström, 2012).

2.1.1.2.1 Defence Acquisition Life-Cycle

The UK MoD's acquisition life-cycle includes the assessment, demonstration, manufacture, in-service, and disposal or termination phases. These stages are separable with both a start and a finish point before progressing to the next phase (UK MoD, 2018). According to Richard (2020), the UK MoD has two models that form the framework of all its acquisitions, namely, "CADMID" cycle: assessment, demonstration, manufacture, in-service, and disposal as well as "CADMIT" cycle: assessment, demonstration, migration, in-service, and termination. The main difference between these two models is the final element, in the CADMID cycle the acquisitioned equipment is disposable while in the CADMIT cycle the final stage is termination since there is nothing for the Services to dispose. Figure 4 below shows the life-cycle with the two decision points.

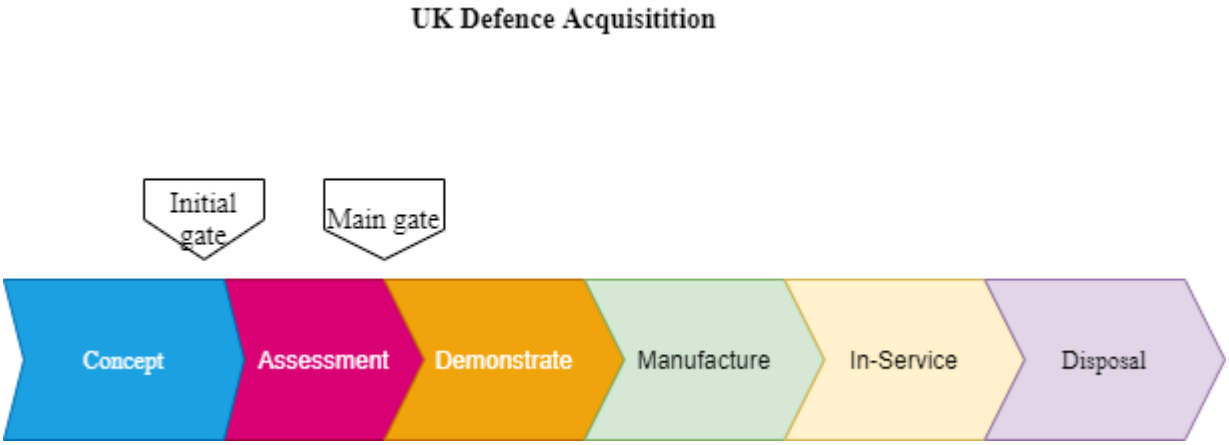


Figure 4 UK Defence Acquisition (adapted from Défense, Equipment, UK by Richards, 2020)

The UK acquisition process is driven by the specific needs of a user instead of weapon features. Therefore, the user stipulates the operational capability requirements, which will direct the acquisition. The drafting of requirements is the joint responsibility of the British Army, Royal Navy, Royal Airforce and Joint Force Commands. It is a common practice that each Service formulates its requirements and obtains approval from centrally located forums. However, the danger of such a practice is that the individual Service requirements often favour its own service; thus, a joint body is better placed to write up requirements than a single service. The MoD requires the drafting of a "*business case*" for a particular Service by the sponsors and project teams aligned with the UK defence policy (Louth & Taylor, 2017).

The six phases of the UK acquisition process are designed to be implemented according to the agreed plan in the preceding phase, followed by the reviewing the results and planning for the next phase (Ekström, 2012). According to UK MoD (2018), the phases of the acquisition life-cycle consist of (1) Concept: the user requirements are expressed through the User Requirements Document (URD) from the sponsors and project teams. The URD stipulates the need for a capability with specifications on the threat environment and related systems, international collaborations, doctrine, operational constraints, concepts of utility and user priorities. The Initial Gate Business Case (IGBC) is developed and submitted for approval during the Assessment Phase. (2) Assessment: The Assessment Phase produces the Systems Requirement Document (SRD) from the URD. The specifications listed in the URD then inform the SRD, which spells out what the system should do to satisfy the user requirements. Therefore, the SRD clearly expresses the system’s functionality, performance requirements, cost and time boundaries as well as the quantities required by the government (Louth & Taylor, 2017). Furthermore, the SRD must ensure a clear link between the user and system requirements, identify appropriate technologies and procurement solutions, together with a well-defined plan for the Demonstration Phase. A Main Gate Business Case (MGBC) must be prepared and submitted for the project's approval within the prescribed performance requirements, time frame and cost (Ekström, 2012).

The next phase is (3) Demonstration: During this phase, the focus is on eliminating development risk and establishing performance points for manufacture and monitoring and ensuring linkage between the chosen solution and the SRD and the URD. Also, a contract that

would meet the SRD requirements is put in place and demonstrates the ability to deliver a fully integrated system. (4) Manufacture: Here, the supplier must supply a military solution per the requirements expressed in both the SRD and URD within the agreed time and cost parameters. The user then accepts the system as specified in the Main Gate agreement and the function is transferred to the user. (5) In-service: the capability of the Service is confirmed and commissioned for operational use as per the Main Gate agreement. The systems' support and performance are maintained within agreed boundaries relating to managing the annual cost, carrying out improvements and refits and acquiring other related acquisitions. (6) Disposal: the last phase involves the disposal of the equipment in an efficient, effective and safe manner. As far as the CADMIT life-cycle is concerned, the M stands for Migration, instead of Manufacture, and T for Termination instead of Disposal (Ekström, 2012).

2.1.1.2.2 UK MoD's Approval of Projects

All projects in the UK MoD go through the approval process, as illustrated in Figure 4 above. Ekström (2012) summarises the approval process in five stages: planning for approval, engagement of approval forum, collection of evidence and development of the Business Case, and the formal approval process. The Initial Gate and Main Gate are the first approval points the project undergoes during the early stages of the acquisition life-cycle. For the project to progress from one phase to the next, sponsors and the project team develop a business case at each approval stage. The Initial Gate takes place before the Assessment Phase and is usually a minor approval process, while the Main Gate occurs after the Assessment Phase and, as the name suggests, is the main approval stage whose mandate is to ensure that the cost of the planned project does not exceed the approved figures.

2.1.1.2.3 Defence Lines of Development

The UK MoD defines capability as comprising the Defence Lines of Development (DLoDs), with an acronym of TEPIDOIL which indicates Training, Equipment, Personnel, Information, Concepts and Doctrine, Organisation, Infrastructure and Logistics (UK MoD, 2011). Therefore, this composite capability is achieved through the combination of many systems. Furthermore, according to Ekström (2012), the concept of inter-operability is a predominant feature in the UK's DLoD. Inter-operability refers to the UK DoD's ability to train, exercise

and operate optimally amongst the various Services and friendly national forces, other government departments and civil organisations.

2.1.1.3 The Australian Defence Acquisition Process

In 2014 the Australian government and its DoD realised the need for this department to work more efficiently and effectively in order to meet its mandate. Australia's MoD sanctioned a review of the Australian Defence Force (ADF) to ensure that it was fit-for-purpose and delivered its strategy with minimum resources. The review concluded that Australia needed a unified and integrated Defence organisation, highlighting the "One Defence" concept to deliver its mission successfully. The ADF should be reformed into a more integrated and inter-operable unit, which allows for the traditional domains of land, maritime, air and space defence to function as a joint force. Subsequently, the DoD has committed to designing an integrated force in the earliest stages of capacity development so that all wings of the ADF becomes a joint project. This reformation process led to the promulgation and implementation of the Capability Life-Cycle (CLC) manual in April 2016 (Ryan & Soutberg, 2016).

2.1.1.3.1 Capability Life-Cycle Process

The CLC is a core acquisition process for the ADF to acquire military capability, including capability definition, acquisition, sustainment, upgrade, replacement and disposal. The CLC prescribes all ADF capability processes such as major capital equipment, information, communications technology (ICT), and facilities. The CLC has been designed to deliver the desired integrated joint force capability that can fight as a "*single warfighting domain*" and strategy-led capability management traceable to government direction (Ryan & Soutberg, 2016). The CLC management levels consist of 1) The Portfolio level, which provides a comprehensive view of the ADF's capability investment, covering capital investment and operating costs, including a holistic perspective which is essential for the prioritisation and timing of investments. 2) The Capability Stream level, which proficiently provides the aggregated capability to represent the critical force elements across environmental domains to enable prioritisation and traceability in terms of government priorities, 3) The Programme level is essential for understanding and managing groups of interrelated capability systems, including the delivery of joint force capability, 4) The Project level provides a discrete

bounded element of work which delivers the capability to the customer and 5) The Product view that virtually encompasses the entire life-cycle that has been introduced to drive more precise recognition of the in-service capability as the goal of project activities (Ryan & Soutberg, 2016).

One of the essential features of CLC is the establishment of CLC management levels which form the basis of the functioning of the CLC. The CLC structure allows for traceability between the capability building blocks and the capability systems, as well as the entire ADF capability, assignment of accountability and responsibility, improvement of coordination and prioritisation of CLC activities, at both the strategic and tactical levels, together with improved visibility of interdependencies and accountability for implementing joint force integration.

The CLC process focuses on a risk-based decision-making model with four phases: Strategy and Concepts, Risk Mitigation and Requirement Setting, Acquisition and In-service and Disposal. This process has three gates as illustrated in Figure 5 below.

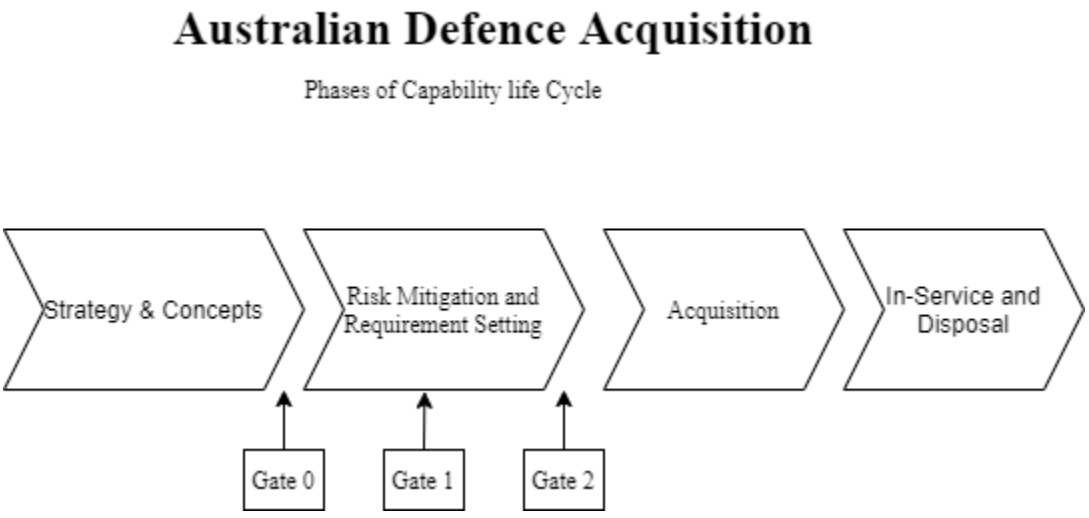


Figure 5: Acquisition phase adopted from Defence Capability Development Handbook (Ryna & Soutberg, 2016).

a. Strategy and Concepts

The Strategy and Concept Phase's core function is Force Design, which provides the "front-end" to the CLC. The Force Design supports the First Principles Review (FPR) of "Establish a

strong, strategic centre to strengthen accountability and top-level decision-making". Through Force Design, a Joint Force by Design is provided, which allows the realisation of an integrated and inter-operable ADF. Force Design is achieved by combining experimentation, war-gaming, simulation and modelling, operations analysis, options development and analysis. The Force Design process delivers the Joint Capability Narrative (JCN), which is a starting point for defining the capability gap or opportunity and ensuring that the joint requirements are directly aligned with strategic direction. From the JCN, the Capability Manager is tasked to develop the Joint Capability Needs Statement (JCNS). The JCNS is the high-level document that records the CM's approach to solving the challenges detailed in the JCN by explaining the capability requirements and available options (Ryan & Soutberg, 2016).

The CM presents the JCNS to the Investment Committee (IC) at Gate 0, whereupon an internal decision about the proposed solution is made. The IC is chaired by the Vice Chief of the Defence Force (VCDF) and may approve further development of the options with agreed requirements, timeframes and funding to Gate 1 or instruct the JCNS to proceed directly to Gate 2. Therefore, the Gate 0 approval represents the official endorsement of the JCNS, Project Execution Strategy (PES) and funding.

b. Risk Mitigation and Requirement Setting

According to Ryan and Soutberg (2016) the Risk Mitigation and Requirements Setting Phase, which the IC approved at Gate 0, is directed jointly by the JCNS and PES. As the name suggests, this phase provides a reassurance to the government that the risks were well known and adequately managed before the capability investments were approved. Furthermore, the capability requirement should be defined to give the government confidence that this requirement will be met. In analysing the risks, different sources of technical, commercial, schedule, financial and strategic risks are considered. Ultimately, the government should be convinced that the acquisition project's approval is a sound decision and, thus, the contracting may proceed.

The Risk Mitigation and Requirements Setting Phase produces a firm contractable proposal for the acquisition and maintenance of the capability for government approval at Gate 2. The MoD, sometimes with another Minister, represents the government. The Integrated

Project/Product Team (IPT) evaluates the tender offers and make recommendations based on the criteria. These recommendations are presented initially to the IC and then to the government for Gate 2 approval.

c. Acquisition

According to Ryan and Soutberg (2014) The Acquisition Phase's primary objective is to acquire a capacity solution that considers the Fundamental Inputs to Capability (FIC) elements and then delivers it into service. The Delivery Group, responsible for acquiring and delivering the capability, will formally and gradually transfer the system to the relevant CM to meet the identified need as per agreement. It is envisaged that through the CLC, projects will be more integrated, and various stakeholders, such as CMs, Delivery Groups, Enabler Groups and people with specialist expertise, will be represented and participate in the IPT. this practice will ensure that all FC elements such as Personnel, Organisation, Collective Training, Major Systems, Supplies, Facilities and Training Areas, Support and Command and Management are properly considered for the capability's entire life-cycle. There are exact steps that have to be followed when a new capability is introduced into Service in the ADF. For the capability to be accepted, it must meet the operational levels through extensive testing and operational evaluation (Ryan & Soutberg, 2016).

d. In-service and Disposal

Once the capability has passed the operation evaluation, it is handed over to the CM and introduced into service. This phase operates from when a capability is accepted until it is retired or decommissioned. The In-service systems are maintained throughout the capability’s operational life and, subsequently, withdrawn from service before it is disposed of or sold. the Sponsor and Lead Delivery Group's responsibilities in respect of capability scope, resourcing, priorities, performance and preparedness requirements throughout its life are defined in the Product Delivery Agreements (Ryan & Soutberg, 2016).

To help understand the link between a PMO and the acquisition process, the researcher established the extent of project management involvement in the DAP.

2.1.2 Project Management in Defence Acquisition Process

The DoD's acquisition process requires general project management skills and knowledge applicable in both other fields and those specific to the DoD acquisition system (Cooley & Ruhum, 2014). According to Brown (2010), DoD policy prescribes that a project manager should be appointed for each acquisition programme. The project managers manage the development, manufacturing and introduction of the new capability into service. Furthermore, the DoD policy establishes structures for PMOs. The PMOs' core function is to oversee projects in terms of cost, schedule and desired performance of the system (Romiti, 2016). Newly appointed project managers who work without knowledge of the DoD programme management principles, processes and jargons will face challenges to their success (Cooley & Ruhum, 2014). The Australian military utilised an integrated project team that represents the various stakeholders' interest in the acquisition process.

In order to attain a global understanding of the DAP and a PMO's involvement in the acquisition process, it is essential to turn our attention to South Africa's military organisational context. Understanding SA's DAP will allow for a comparison of the military's organisational systems and the global best practices to establish the similarities and differences.

2.1.3 Defence Acquisition in South Africa

The structure of the DoD is headed by the Minister of Defence and Military Veteran. The DoD is divided into two main parts: the one is led by the Secretary for Defence and the Accounting Officer, and the other by the Chief of the SANDF, responsible for military operations. The responsibility of acquisition and procurement for the MoD resides with the Secretary for Defence. The Secretary for Defence comprises several divisions such as Finance and DMD. Furthermore, the DMD is led by the Chief Director Defence Material, who leads the procurement and acquisition of goods and services for the DoD.

Furthermore, there are different directorates, namely the Directorate Army Acquisition, Directorate Air Force Acquisition, Directorate Navy Acquisition and Directorate Common Weapons Acquisition. These directorates, in turn, have project management teams that function under the various services. The SANDF is under the command of the Chief of the SANDF and consists of different entities such as the Army, Airforce, Navy and Military Health Services,

and divisions such as the Joint Operations, Intelligence and Logistics Divisions. The various Service divisions are responsible for the force preparation, while the Joint Operations Division deploys the forces (Department of Defence, 2019).

The South African military differentiates between which goods and services may be procured through acquisition or procurement processes. The concepts of acquisition and procurement are differentiated and defined. According to Defence Acquisition Policy (2019), acquisition refers to activities undertaken to meet Category 1 requirements. Acquisition commences with the identification of requirements up to the Transition phase. On the other hand, procurement refers to an agreement that will benefit both parties in delivering the critical requirements for Category 2 Material.

The goods and services classified as Category 1 Material may only be procured through the acquisition process and includes material, items, sub-systems, and products constructed into military systems to develop military capability. In contrast, Category 2 Material refers to the equipment, elements, products, and parts that are commercially available ‘off-the-shelf’ and are procured through the procurement process (Defence Acquisition Policy, 2019).

2.1.3.1 South African Defence Acquisition Process

It is crucial in this study to give an overview of the SA military acquisition process to contextualise the study. This section, which will cover the acquisition process of the military organisation in great detail, will assist in answering the first research objective from Section 1.5: "*To determine project management processes within each PMO during acquisition management within the military organisation*".

SANDF strategic objectives find expression through military strategy and long-term capability strategy. Through the DAP, the DoD endeavours to structure the process of armament acquisition methodically and systematically. Therefore, DAP attempts to direct the DoD armaments acquisition process that is aligned with the military strategy. The South African military's acquisition process is fully documented in the Defence Acquisition Policy (DAP) of 2019. According to Theletsane (2017) all services within the SANDF are using the same acquisition process as prescribed by DAP and depicted below in Figure 6.

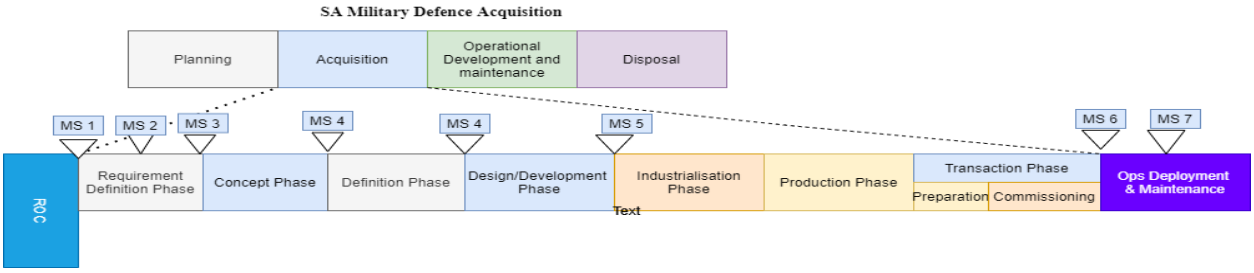


Figure 6: SANDF Acquisition process adopted from Smith 2012.

The SA DoD acquisition process, as per Figure 6, consists of different phases, including planning, acquisition, deployment, and disposal. Furthermore, acquisition process levels commencing with the concept phase, definition, design, industrialisation, product and commissioning phases. The Service initiates the process by preparing an Operational Requirement Capability (ROC) document to address a specific and identified need that SANDF must meet as part of its operational requirement (DAP, 2019). It can take up to two years to register and authorise a Service project (Theletsane, 2018). ROCs are compiled for the sole purpose of defining requirements for new operational capabilities or to expand or improve already existing ones (Commission, 2015). Once the ROC is compiled and approved as a project by a specific Arm of Service, it is referred to the Operations Staff Council (OSC) for more intense integration and final approval. This synchronisation and integration should be in line with the SANDF's capability strategy and long-term acquisition plan. In the absence of these requirements, the Changes to the Strategic Capital Acquisition Master Plan (SCAMP) is used to direct the acquisition of goods (DAP, 2019). The Acquisition Phase comprises a 15-step process:

- **Acquisition Phase**

Stage 1: Preliminary Study- Immediately after the ROC, the Chief of the Service appoints a Project Officer who conducts a preliminary study to generate inputs to produce a Staff Target (Commissioner, 2015).

Stage 2: The Staff Target (ST) − the ST is a summary of the outcomes of the Preliminary Study.

Stage 3: Functional Study (FS) − the FS clarifies the functional and logistical requirements for the project.

Stage 4: Staff Requirement (SR) − the SR spells out functional and logistical requirements and performances needed to meet the capability requirement (Defence Acquisition Policy, 2019).
Stage 5: Project Study (PS) − the PS aims to establish the best way to satisfy the capability requirement. Therefore, various options, such as do nothing, upgrade the existing systems, develop a new system, and acquire a new system can be suggested.
Stage 6: Project Study Report (PSR) − the PSR provides a mandate to pursue the "*most efficient and cost-effective solution*".
Stage 7: Development Study (DS) − when a recommendation relates to making or upgrading the system, the DS examines the concept solution in great detail.
Stage 8: Development Plan (DP) − the DP is developed in the case of a 'to make' or 'upgrade' decision and provides a summary of the DS results.
Stage 9 A: Acquisition Study Single Tender − When a decision to buy has been made in response to the PSR recommendation, the most suitable supplier is sought.

B: Acquisition Study Competitive Tender − When a decision to buy has been made per the PSR recommendation, the most suitable supplier is sought from the competitive defence industry through open tender.
Stage 10: Acquisition Plan – The AP summarises the results of the AS and documents the investigation.
Stage 11: Industrialisation − The industry develops and qualifies its manufacturing processes.
Stage 12: Production − The focus during production is to manufacture systems according to the requirements of the DOD.
Stage 13: Transition Plan − During the transition, the system management's responsibility is transferred between the Defence Material Division (DMD), System Manager and Service.
Stage 14: Transition − The final product is integrated, handed-over and commissioned between the DMD, the System Manager and Service.
Stage 15: Project Closure Report − PCR summarises the results of the entire project.

The formulation of the details regarding planning and control of the execution of projects are performed by the project team, which is made up of the Service Project Officer, the ARMSCOR Programme Manager, and the Contractor's Programme Manager. The Project Officer (PO) and the ARMSCOR Programme Manager constitute the Project Management

Committee and are responsible for the project's day-to-day management. The PO provides advice and guidance to the ARMSCOR Programme Manager regarding all relevant military aspects during the product's design and development. All project team members within the DoD receive in-house training and, preferably, possess National Qualification level 5 or 6 academic qualifications or certification in appropriate technical fields (DAP, 2016). Theletsane (2018) found that formal education is not a prerequisite for a SA PO Manager in the SA Navy and thus, the POs often lack technical expertise and are, consequently, project administrators rather than project managers.

2.1.3.2 Approval of Acquisition Projects

The approval and authorisation of projects are directed through ARMSCOR and the Joint Management Forums (Defence Acquisition Policy, 2019). All the approval bodies are constituted in line with government regulations. Every project is subjected to scrutinization by different approval bodies both within the DoD and outside the department. The project only progresses to the next governance body for approval once the prior relevant military entity has recommended it. The military approval bodies consider the project based on the needs of the SANDF. There are different approval bodies, with the first being the Service and the Chief of Service Chairs. The Operations Staff Council (OSC) at Joint Operations Division verifies that the acquisition is aligned with the strategic objectives of the DoD. The Military Command Council, chaired by the Chief of SANDF, receives the STs and APs for projects to keep SANDF’s top management abreast with the undertaken projects.

The Armaments Acquisition Council (AAC) is the highest body of approval, and it is chaired by the Minister of Defence and Military Veterans. The AAC's primary function is to ensure armament acquisitions comply with the DoD’s policies and procedures. Armaments Acquisition Steering Board (AASB) is the second-highest body of approval for armaments acquisition, and it is chaired by the Secretary of Defence (Sec. Def.) The AASB's primary focus is to ensure acquisition accountability and confirm the project's business case. The Chief of Defence Material chairs the Armaments Acquisition Control Board (AACB) that is the third-highest body of approval, and it is a nodal point for DoD projects (Defence Acquisition Policy, 2019).

There are required approvals and authorisation by different bodies at various phases of the project, as per Figure 6 above. Firstly, each Arm of Service has its own approval body that approves ROC and subsequent milestone documentation for the project. The Service then refers to ROC for approved by the OSC through verification that it is in line with Military Strategy and the Capability Master Plan. The next approval stage of the project is the Staff Targets (ST), which the relevant Service Chief, OSC must sign, Military Command Council and approved by AAC and/or AACB depending on the type of the project. Once the project reaches the Staff Requirement (SR), it is referred to the AACB for approval by confirming the process and financial integrity. The Project Study Report (PSR) is presented to the AACB which verifies the process integrity before recommending it to the AASB for approval. The AASB consider the financial and political integrity of the PSR before approval. The Developmental Plan (DP) is presented and approved by the AACB. The Acquisition Plan (AP) for all projects is approved by the AAC and/or the AASB. The last stage of approval is the Transition Plan whereby both the DMD (Director Army/Air Force/Naval/Common Weapons Acquisition) and the General Officer Commanding (GOC) of the relevant Formation/System Group Director approve the project (Defence Acquisition Policy, 2019).

2.1.4 Comparing of USA, UK, Australian and SA Defence Acquisition Systems

Comparing the global defence acquisition and the SA DAS has highlighted exciting similarities and differences. All the reviewed countries have a different approach to the DAP.

The global influence on the countries respective approaches to acquisition is evident because they all follow a life-cycle approach in managing acquisition projects to deliver military capabilities. The entire acquisition process is prescribed by DoD policy for all countries under review. The Australian DoD policy is heavily based on the Project Management knowledge areas from the PMBOK and others such as AS21000, ISO55000 and Managing Successful Projects, while the USA policy is also based on PMBOK. Integrated Project Teams are used in the USA, UK, Australia and SA, with slight modifications in each country. The Australian approach is the most comprehensive approach, with different stakeholders' interest represented in the IPT, including the Project and Product Sponsor, functional subject matter experts, and representatives from all FIC-provider Groups, including industry, Estate and Infrastructure Group and Chief

Information Officer Group, Defence Science and Technology Group, Chief Finance Officer Group and Defence People Group.

The significant differences between the acquisition processes are in the strategic capability guidelines, cohesion, integration and inter-operability of the force. The USA and Australia have undergone major reformation of their acquisitions systems due to lack of cohesion, cooperation and inter-operability of the Services. In Australia, there is a single body responsible for the Force Design, strategic capability guidelines and ensuring the jointness and integration of the force and prioritisation of capability investment. For instance, such a body in Australia is the Joint Force Authority and chaired by the Vice Chief of the Defence Force. Emanating from such a body's discussion, a Capability Manager (Chief of the Service) will be tasked to develop the requirements, Project Execution Strategy and funding requirements. This approach represents the top-down approach. In contrast to this method, the USA, UK and SA have a similar approach in that the requirements are initiated from the Arms of Service and another body is responsible for ensuring cohesion, integration and inter-operability of forces. This latter approach represents a bottom-up approach. It is worth noting that the USA seems to have characteristics of both the top-down and bottom-up approaches. Sullivan (2010) argues that the USA DoD has not adopted the Portfolio Management Approach when it comes to the capability investment which would allow for an integrated and prioritisation of capability and resources to eliminate duplication. The author argues that JROC has not honoured its responsibility but left the prioritisation and decisions on defence capability to the Arms of Service, even though it is expected to have a joint perspective to look across the entire DoD to ensure proficiencies and eliminate wastage. Francis (2009) agrees that as long as the capacity requirements and investment decisions are based on the Services and individual platforms, the DoD cannot adequately deal with the issue of the cohesion of the Arms of Service. Therefore, a joint body is better placed to write up requirements than a single Arm of Service (Louth & Taylor, 2017).

The USA and Australia have three decision points or gates, the UK has two gates, while SA has seven decision points. In Australia and the UK, and to a larger extend the USA, the decision points come early in the life-cycle phase. There are no further decision points once a decision to acquire has been made. In SA the decisions are taken throughout the acquisition process. The

comparison of USA, UK, Australia and SA acquisition processes is summarised below as shown in Table1.

Table 1: Comparing USA, UK, Australian and South African Defence Acquisition Process

Description	**United State of America**	**United Kingdom**	**Australia**	**South Africa**
The forum responsible for the strategic capability guideline, cohesion and integration of the force	JCIDS and JROC	Unknown	IC and JFA both chaired by the Vice Chief of Defence	OSC
Defence Acquisition Cycle	Five Phases	CADMID/CADMIT	Four phases	Four phases
Milestone Decision	3 Milestone decisions	2 Milestone Decisions	3 Milestone Decisions	7 Milestone Decisions
Requirements generation	SMART Requirement United State joint Chief of staff (JCIDS) and JROC. Some authors and reports have found that the requirements are still generated by services and that JCIDS and JROC have not fulfil their roles.	SMART requirement Responsibility each of the staffs of the four commands and JFC (Comprised of Army, Navy and Airforce).	Requirements are generated by IC and JFA and given to Services to develop further.	Generated by the Services.
Approval Forums	MDA, DAB, OSD	Equipment Approvals Committee The primary approval points are the Initial Gate and Main Gate that the project undergo during the early stages of the acquisition life-cycle	First and Second Pass Approval for each project to provide clear lines of accountability	OSC AAC AASB AACB

2.1.5 Lesson for South African Military Organisation

There are valuable lessons that the SA military can learn from the challenges and successes in defence acquisition experienced by the USA, UK and Australia. The DAP worldwide is complex and full of pitfalls, and it is for this reason that many countries are continually assessing their processes and introducing reforms to ensure their continuous improvement. In the USA, Francis (2009) found that when capacity requirements and investment decisions are based on Arms of Service and individual platforms, the DoD cannot adequately deal with the issue of the cohesion of services. Sullivan (2011, p. 21) agrees with these assertions that "*service-driven requirements and funding process*" will always hamper cohesion and effectiveness and result in the undesirable duplication of requirements. A report to the Congregational Committees by the USA Government Accountability Office on the DoD Weapon System requirements indicated that although the JROC has a joint perspective to look across the entire department to ensure cohesion, prioritisation of requirements and eliminate inefficiencies and potential redundancies. The JROC has failed to prioritise requirements, identify duplications across Services' projects and adequately identify capability gaps (United State Government Accountable Office, 2011). Louth and Taylor (2017) have made a similar observation regarding of DoD in the UK, namely that when different Service chiefs develop their requirements, the primary challenge is that they choose projects that suit their specific Arm of Service without considering their cohesion and integration with the overall defence capability. Therefore, these researchers proposed a central and joint body for generating requirements.

Therefore, the evidence from the reviewed countries suggests that when capability requirements are formulated by a specific Arm of Service and a separate forum is responsible for ensuring cohesion and integration within the Defence Force, it is likely to face challenges. From a global perspective, it would seem that the DoDs that apply this particular defence acquisition approach will always struggle to achieve cohesion, integration and inter-operability amongst the Arms of Service as long as requirements are generated by a single Service. It is for this reason that the Australian acquisition approach differs significantly from both USA and UK in that the IC and JFA, under leadership of Australian Vice Chief of Defence, which is involved in force design, strategic capability development and cohesion, initiate the requirements and task the Arm of Service to further develop these requirements, which are already in line with the defence strategy

and are integrated with the overall defence capability. In this manner, the requirements are aligned and integrated before the Arm of Service is tasked with the development of the capability requirement to initiate the acquisition process.

Furthermore, the USA and the UK have only two approval gates, while Australia has two or three gates depending on the specific requirements of the project. The SA Defence acquisition goes through different boards, namely the OSC, MCC, AACB, AASB and AAC. Other countries approval bodies are divided into military (internal) and political (external) approval gates. Within the military, the forum that is responsible for prioritising capability projects also approve the projects, and once approval is granted, the project moves to the political approval stage. Therefore, having many gates might contribute towards the delay of projects in the DAP.

2.2 Defence acquisition project management

Military organisations use project management principles and procedures in their defence acquisition projects to acquire weapons and related services to achieve military operations (Erenel & Eren, 2018). These DoD project methods are also contained in the Project Management Body of Knowledge (PMBOK) and recognised worldwide in both academia and the business world (Sugai, 2015). The project management method of acquisition was initiated in the DoD, and its functionality is documented in the DoD 5000 and other series of documents. The traditional project management methodologies, such as the system development life-cycle approach, have not delivered successful projects due to rigid administrative processes. Other methods, such as EPM methodologies, can enhance the project planning process with the level of standardisation and consistency. Many organisations are increasingly becoming aware that enterprise project management methodologies are the most effective when the methodology is "*based on templates rather than rigid policies and procedure*" (Kerzner, 2018, p. 193).

2.2.1 Project/Programme Manager

The Programme Manager is appointed for each DoD acquisition project and represents the military organisation's interest as a source of knowledge and guidance to ensure that the weapon requirements are met most efficiently and cost-effectively within a reasonable time frame (Brown 2010). Project officers are used to provide project management expertise for the acquisition projects.

According to Biafore (2011, p. xix), "*if you have little or no formal education in project management, you have become an accidental project manager*". Theletsane (2018) found that formal education is not a prerequisite for SA Navy Project Officers/Managers. They lack technical expertise and are project administrators rather than project managers. Kupec (2013) opines that it is critical for the defence industry's project managers to possess operational knowledge of the technology involved in their projects. Rendon *et al.* (2012) suggested that adequate project management training is made available to ensure that military personnel involved in acquisition are adequately trained and qualified. Jenkins *et al.* (2015), however, asserts that project management plays a minor role in acquisition. The military, however, has now made this process the main factor which has led to many projects being under the control of programme managers without technical expertise. It is a mistake to conclude that people only require business management knowledge to manage a business or public institution.

According to Kupec (2013), the defence industry requires suitably certified specialist project managers to fulfil military requirements. According to PMI (2021), professional development for project management is not a once-off event but should be a continuous improvement process. Although technical expertise is the core skill for project and programme management, the combination of technical know-how, leadership and strategic business management is the required competence for professional project managers. According to Theletsane (2018), the SA Navy's personnel lack training and competence in project management because there are no prerequisites for a member to become a project manager in this Arm of Service. Furthermore, PMI (2019) asserts that the continuous transfer of knowledge and integration is essential for project management. A project manager should contribute to knowledge transfer and expertise and participate in training, continuous professional development and educational courses, such as offered by tertiary institutions and the Project Management Institution.

2.2.2 Integrated Project Team

The defence projects are managed through cross-functional teams (Gadeken, 2015). Currently, defence acquisition teams are typically called integrated solution teams or integrated project teams (IPTs). The IPTs share responsibility, authority and resources to achieve their collective missions. Rene *et al.* (2013) found that defence personnel's physical proximity can make it easy

to use the project team in managing the acquisition. Also, a formally appointed and qualified project officer with the necessary authority should lead the project. Teamwork is demonstrated by effective, open and honest communication daily. All team members must possess a positive, 'can-do' attitude. Truly effective IPTs realise that diversity, individuality and creativity are vital to success. Everyone must be committed to operating within the cost and schedule parameters, as well as the quality standards of excellence and must place the achievement of military customer goals as the primary focus of all team activities. Developing strong teams and individual leadership skills is essential for every organisation, especially for IPT leaders responsible for managing large, complex programmes and related projects (Garrett & Rene, 2007). It is recommended that the IPT comprises a team of diverse personnel with the relevant skills necessary for the undertaken project.

2.2.3 Competence of Project Manager

Dinsmore (2014) suggests that having a career structure is critical for developing the organisation's project management capabilities. Therefore, the organisations should have a structure that allows the career progression, development and growth of the project management staff.

2.2.3.1 Staffing of Project Manager's team

According to Söderlund, *et al*. (2012), there is a staffing level in the project department which raises a concern about the loss of expertise and specialised knowledge. The defence PMO should be staffed with subject matter experts, who are disciplined thinkers, to manage complex projects effectively (Gadeken, 2015). When seeking employees for the PMO environment, there are mainly three sources of employees to fill vacant positions − new or existing employees, temporary employees from within the organisation and contract employees for skills that are not available within the organisation (McCormick, 2016). Pellicer *et al*. (2014) recognise the familiar challenges related to assigning the existing departmental staff to the department project since they may lack the necessary specialist skills. Often departmental staff who are appointed temporarily to the project may be required to perform their new duties over and above their typical tasks, and, in addition, there are often delays in decision-making in such contexts.

2.2.3.2 Training and Mentorship of PMO staff

According to Kerzner (2010), PMO staff must engage in appropriate onsite training, knowledge sharing and a certificate programme. The PMO's responsibility is to provide project management education that will benefit both the organisation and the staff members. Training assists in improving the various competencies of the PMO professionals involved in the organisation. Continuous transfer of knowledge and integration is also essential for effective project management. A project manager must participate in training and actively contribute to knowledge transfer (Project Management Institute, 2019).

It was noted that in the USA DoD, combat officers were used as project managers on a rotational basis without any prior training and project management experience. After making such an observation, the Deputy Secretary of Defence, who had many years of experience managing projects and other business matters, concluded that project managers need an in-depth knowledge of the full spectrum of project management functional disciplines and processes (Gadeken, 2015). It is important to have project managers who have specific technical project experience together with soft skills such as recruiting, supervising, developing, coaching and mentoring top project management talent (Project Management Institute, 2016). Aziz (2014) mentioned that one of the PMO's functions is to provide mentoring and coaching to support project managers. Taylor (2016) agrees that mentoring and coaching are important functions of the PMOs.

2.3 Project Management Office Concept

Spivak (2019) asserts that a Project Management Office (PMO) is designed to manage various organisational projects effectively. Because of its primary focus on effective management of projects and achievement of goals, a definition of the PMO has developed over time, yet there is no consensus among the reviewed researchers regarding the definition of a PMO in terms of its primary function and location within the organisational structure.

Project Management Institute (2017, p. 34) describes a PMO as an *"organisational structure that standardises the task-related governance process and facilitates the sharing of resources, methodologies, tools and techniques"*. Pinto (2013) defines a PMO as a central office focusing primarily on managing projects that endeavour to achieve the organisation's optimum

functioning through projects. According to Philbin (2016) the PMO uses accumulated knowledge and resources to build an organisation capacity focused on projects from the project's conception to its completion.

2.3.1 Purpose of PMO

The purpose of a PMO is to align the organisational projects with the organisation's strategic goals and ensure that all projects are realised, scheduled, budgeted, and quality controlled (Fayadh 2020). According to Karkukly (2017), a PMO's primary purpose is to ensure a consistent approach to all projects within the organisation. To achieve this purpose, a PMO puts measures and systems in place, such as project structures, methodologies, reporting, tools, techniques, templates, forms and procedures, and implements project management systems and tools, and provides project management training to relevant employees (Mohlala, 2017).

2.3.2 Types of PMO

According to Philbin (2016), different organisations across different industries view a PMO as an effective platform to create strategic projects and ensures that strategic projects are directly linked with the overall organisation strategy. A PMO location in the organisation structure may vary from strategic, tactical or operational depending on the degree of authority, acceptance, adoption and autonomy in its role, purpose and function within the organisation (Monteiro *et al*., 2016). PMI agrees with this view that the types of PMO structures within the organisations differ based on their degree of influence and control on the overall organisation regarding projects (Project Management Institute, 2013). Project Management Institute (2013) suggests that there are three types of PMO structures in organisations:

- **Supporting:** Here, the office plays a consultative role for projects by supplying templates, project management best practices, training, access to information and act as a reservoir for knowledge and lessons learned from other projects. The PMO primarily is a resource and has a low degree of authority and control.
- **Controlling**: The controlling PMO provides advice and governing guidelines that must be complied with, such as project management standards, specific templates, forms that must be used in managing projects within the organisation. Therefore, this office performs specific tasks as well as playing a supervisory role. This PMO has a certain level of authority and control.

- **Directive**: This type of PMO takes direct control of projects to ensure that projects are delivered on schedule, within budget and scope and of good quality. This PMO is common in large organisations and has a high degree of control and authority.

Much has been written on the types of PMOs by various authors and researchers. There are at least 47 types of PMOs that are different in terms of "structures, roles, functions, and descriptions", however, since most of them share the same names and functions, the number can be reduced to 25 models. Various authors concluded that "*all authors*" suggest either three, four or five PMO models (Monteiro *et al*., 2016). However, Ferreira (2019) believes that there are between three to seven types of PMOs identified in the relevant literature. Hubbard and Bolles (2015) agree that most PMOs fall under one of these seven categories.

Ferreira (2019) concludes that only three of these models are recommended for practical reasons. The author argues that this approach allows different PMOs to appropriately align to correct hierarchical organisation levels, including strategic, tactical, and operational levels. Pinto *et al*. (2010), Crawford (2010) and Ferreira (2019) recommend three types of PMOs to include the following characteristics:

- **Project/Programme PMO** − The Project/programme PMO handles only one project of the organisation and functions at an operational level. Although this PMO focus on a single project, the project is generally large and complex.
- **Departmental/Unit PMO** − The Departmental PMO operates within the department or business unit of the organisation and functions at the tactical level and seldom at the strategic level.
- **Enterprise-wide PMO –** The EPMO manages the corporate or enterprise and functions at the strategic level. The EPMO focuses on ensuring that projects align with the organisation's corporate purpose, vision, mission and strategic direction. The research project investigates the feasibility of an EPMO, which is highlighted in the following section.

  The following table represent the capabilities that different types of PMOs focus on (PMI, 2016)

Figure 7: Type of PMO and Corresponding Functions (adopted from PMI n.d)

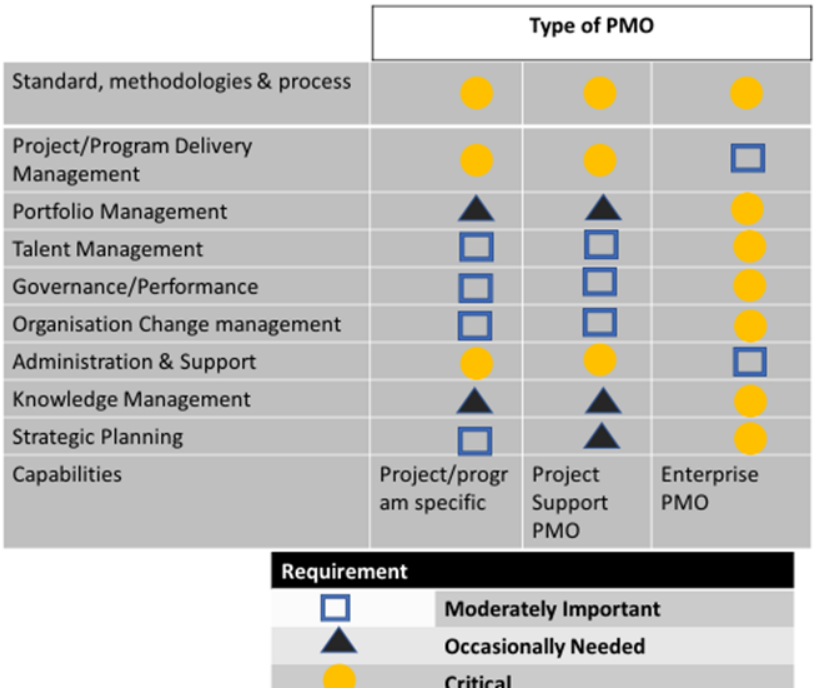


Figure 7: Type of PMO and Corresponding Functions (adopted from PMI n.d)

2.3.3 Challenges with traditional PMO.

According to Rathore (2010), many challenges face traditional PMOs, and organisations now seek business solutions to address these problems. Okereke (2020) agrees that PMOs are experiencing challenges regarding the misunderstanding of accountability levels, lack of coordination, and poor integration of knowledge, processes and capacity. Furthermore, Newbry and Krikke (2016) assert that the major PMOs' problems are the poor execution of projects and the poor coordination of organisational resources and facilities, which has resulted in an escalation of costs.

Therefore, according to studies, creating an EPMO is a possible solution for these prevailing challenges (Newbry & Krikke, 2016; Rathore, 2010). Hubbard and Bolles (2016) assert that an EPMO's primary role is to ensure the integration of projects, programme, and portfolio practices. Furthermore, an EPMO is responsible for ensuring that PMOs use the best practices, tools, and templates and that these PMOs are provided with adequate support and guidelines. Therefore,

EPMO's creation signifies a strategic approach to project management, whereby decisions concerning all organisational projects are centrally taken (Richards & Jackson, 2019). According to Letavec and Bolles (2012), an EPMO provides an organisation-wide approach to project management with processes and procedures that all functional or departmental PMOs use. Metuge (2014) concludes that an EPMO brings about the required coordination, cooperation and support among the different departments' projects and creates harmony between all organisational projects. In a similar study within the public sector, Selepe (2019) found that an EPMO provides the desired coordination among all the PMOs when they are not located in the same geographical area.

2.3.4 Enterprise PMO

The EPMO concept is relatively new; however, organisations globally are increasingly implementing it (Selepe, 2019). Levin (2014) considers an EPMO as the all-encompassing umbrella, which delivers oversight to several projects and governance to multiple PMOs. The study will adopt the definition of an EPMO as defined by Project Management Institute (2013, p. 13), which states that an EPMO "*facilitates governance at the enterprise level and incorporates strategy development and strategic planning support"*. An EPMO does not replace the traditional PMO at the departmental level but complements its operations (Carsten *et al*., 2013). The EPMO is a source of the organisation's project management expertise and the main supplier of skilled, educated and experienced experts in project management programmes and portfolios (Hubbard & Bolles, 2016)

Numerous writers have suggested that an EPMO delivers enterprise-wide assistance with governance, mentorship, best practice, tools, consistent processes and centralised, strategic-level corporate functions (Letavec, 2015; Yazhari, 2014). Recent studies have provided overwhelming support for this view (Richards & Jackson, 2019; Selepe, 2019; William, 2017). Although the EPMO has proven to be effective in delivering what is lacking in the traditional PMO and assists in aligning the project to organisation strategy, the mere establishment of an EPMO does not guarantee success. There are critical success factors needed to ensure that EPMO is established and functions effectively to deliver value to the organisation.

2.3.5 Enterprise-PMO Critical Success Factors

According to Alharthi (2017), the Critical Success Factor (CSF) concept was originally developed by Ronald Daniel in 1961 and has since become popular in the business and academic worlds. The CSF refers to the elements needed and achievable for a project to be deemed successful (Heldman, 2010). For the EPMO to be established successfully, there are key elements required to be in place since their failure would directly impact the project's successful execution (Moreno-Monsalve, 2020). The available literature was critically reviewed to identify CSFs for a successful EMPO. The study will use the prominence and frequency given to the CSFs in the said literature as criteria to select the CSFs. The list of CSFs that were mentioned most are discussed below.

a. Top Management Support

The dedication, support and commitment of the organisation's top management is important for the successful implementation of the EPMO (Fatah, 2013; GRT Consulting, 2019; Verzur, 2018). The organisation's executive should support EPMO entirely to enable it to fulfil its purpose (Patel *et al*., 2012; Rathore 2010).

b. Positioning of the EPMO

Many researchers (Fatah; 2013; Hubbard & Bolles, 2015; Patel *et al.*, 2012; Rathore, 2010) emphasise the importance of positioning the EPMO as an independent business unit at the strategic level of an organisation that is centrally located within the organisation.

c. EPMO Structure

The organisation should consider the appropriateness of the EPMO to organisational structure (Fatah, 2013). It is vital that all PMOs report directly or indirectly to the EPMO (Patel *et al.*, 2012; Rathore 2010).

d. Clear Communication and Reporting Channel

The EPMO should provide a clear and open communications system throughout its PMOs (Metuge, 2014; Patel *et al*., 2012; Rathore 2010). The EPMO should foster open communication and collaborative engagements amongst the PMOs (John, 2016).

e. Staff with Appropriate Expertise

Verzur (2016) states the importance of identifying a leader with a wealth of knowledge and experience to establish the EPMO. For the EPMO to be effective, it must be staffed with people who possess project management expertise and business acumen (Patel *et al*., 2012; Rathore 2010). Therefore, the proficiency of the EPMO leadership and its staff is critical (Fadah, 2019).

f. Organisational and Cultural Change

The establishment of the EPMO requires a change of the organisation's cultural practice and the adoption of a new culture (GRT Consulting, 2019). A champion and catalyst for organisational change must be appointed to lead the process (John, 2016; Verzur 2016).

g. EPMO Objective Focus

The objective of the establishment of EPMO should be known throughout the organisation (Fadah, 2019). The EPMO should focus on achieving results instead of tasks, tools, templates or policies (Martin, 2016; Metuge, 2014).

h. Standardisation of Processes

The EPMO should ensure the standardisation of processes (Patel *et al*., 2012; Rathore 2010) to drive the consistent use of project management processes, work with the PMOs to facilitate, and execute projects and ensure that the application of the project management framework is flexible. It should hold the local PMOs accountable for following standards, drive the use of metrics to make better decisions, provide a portfolio view of the business's projects and resource needs, and evaluate the level of project management maturity (Martin, 2016).

i. Continuous Improvement

When the EPMO is successfully implemented, it depicts its value, project portfolio management maturity and improves its capability (GRT consulting, 2019). It encourages continuous

improvement by using flexible processes and the best practises and lessons learnt. The EPMO's performance must be measured in order to render the necessary support as an ongoing improvement process (John, 2016).

j. EPMO Charter

According to Fatah (2013,), the EPMO should establish a clear charter. Furthermore, it should also have a specified charter for each approved project (Metuge, 2014).

Figure 8 below is a summary of the CSFs of the EPMO. The x-axis shows the frequency with the individual CSFs were discussed in the literature reviewed in this study, while the y axis shows the ten (10) CSFs that were considered as potential entities for the study.

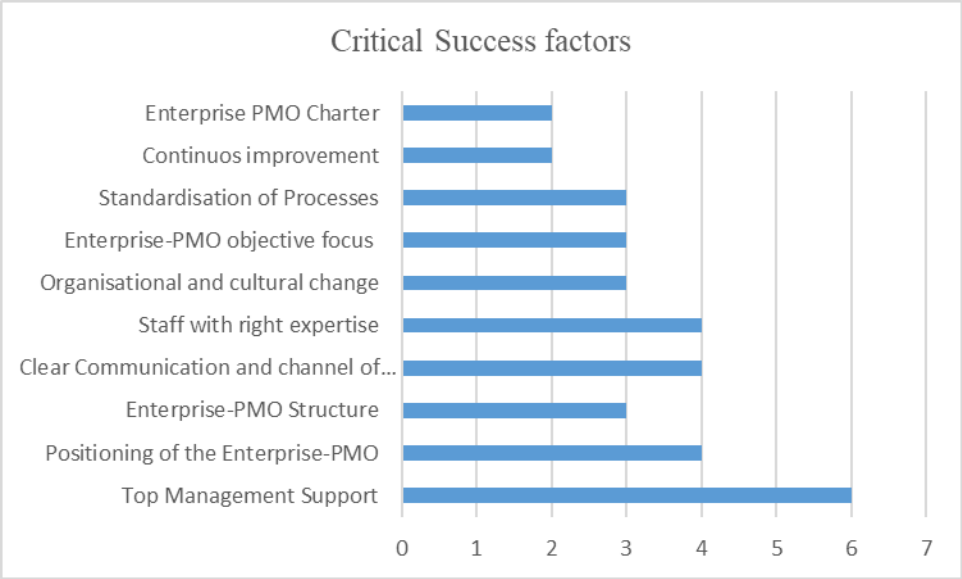


Figure 8:CFS citation frequency in the literature review (adopted from Alharthi, 2017)

The EPMO is not created for the sake of itself but to deliver specific value to the organisation. Therefore, it is critical to consider the benefits that its establishment will bring to the organisation to determine whether or not "the means justifies the end".

2.3.6 Benefits of an EPMO

In general, an EPMO, or PMO, essentially involves an organisation's functions such as finance and human resources. As such, it needs to prove its worth or value to the organisation as a whole. Prior studies have identified many benefits of an EPMO. These benefits include overseeing multi-departmental or divisional PMOs as a governance group that reports directly to the CEO. An EPMO has the potential to deliver value because of its positional authority and enterprise-wide accountability (William, 2017). Richards and Jackson (2019) identified EPMO's key value as limiting projects that do not fit organisational goals and structures. Due to its capacity to provide oversight and governance to the enterprise-wide project management, the EPMO creates and sustains project and programme management tools aligned with best practice and PMI standards, policies, and procedures (Maryland, 2014).

The PMI, the internationally acclaimed overseer of the PMBOK, in its Practical Guide for navigating complexity has concluded that the organisation that implements the EPMO will enjoy some benefits. The EPMO creates stability and consistency by standardising processes, procedures, and guidelines, which help staff manage complex projects. The measures used to evaluate projects and how they operate are established, clearly defined, and well understood. This process results in a better understanding of the audit results that help the organisation to make better decisions. Furthermore, the EPMO provides clarity and eliminates confusion regarding the roles and functions of various PMO levels. The provision of an overarching regulatory framework, through the use of standard tools and templates and the availability of expert support and mentorship, helps remove barriers to project success. The EPMO records the projects' historical data and lessons learned to facilitate training to lessen the complexity and anxiety of dealing with unknown factors (Project Management Institute, 2014).

Letavec (2014), in his book, Strategic Benefits Realisation, argues that traditional PMOs face serious challenges without the overarching governing structure of the EPMO. These challenges can be eliminated, and the organisation can experience the value of the EPMO. The EPMO provides integration of PMOs across the organisation with standardised processes that allow individual PMOs to tailor processes, methods and tools, within the provided boundaries, to suit their unique situation. The EPMO eliminates the lack of coordination and integration amongst

the PMOs and removes the inconsistencies and lack of standardisation in processes and methodologies prevalent in the organisation's PMO units (Letavec, 2014).

In the comprehensive paper on EPMO, Rathore (2010) concludes that this system is growing in importance to today's organisations. It proves its value to the organisation by ensuring that more projects are delivered within the required time, budget and quality specifications. There is also an improvement in the selection and alignment between the undertaken projects and the strategic objectives. Due to top management's backing, there is 'buy-in' from PMOs' management, which leads to improved project success. There is better management of resources, and the duplication of efforts amongst the departmental PMOs is eliminated. The communication channels and system are well established and clearer, resulting in quicker responses and decision-making. Furthermore, the partnership and cooperation between departments are improved through the implementation of the EPMO, and the projects have become more visible. Finally, the EPMO provides efficiency in project delivery in terms of return on investment and time since risks are identified timeously and mitigated (Rathore, 2010).

In a recent study on the effective roles of PMO, Chaza (2019) identifies the additional benefits of the EPMO relating to the consistent and predictable delivery of successful projects and a visible record of the state of projects and their finances for the top management. Enterprise-PMO lays a solid foundation for building a compelling portfolio, ensuring congruence between resources and organisation strategy, and focusing on stakeholders' satisfaction. There is a concerted drive towards employee productivity, implementing standard practices and cost reduction by managing resources better, eliminating wastage, and receiving value for investment (Chaza, 2019).

It is evident from the reviewed literature that there are benefits that come with the implementation of an EPMO in an organisation. The literature seems to overwhelmingly suggest that a centrally located EPMO provides much-needed governance framework structure, consistent and standardised processes, methodologies and tools for departmental or divisional PMOs and eliminates the challenges of a lack of collaboration and coordination.

the EPMO, however, is not without its share of challenges. An organisation should be aware of these pitfalls in order to navigate its way through them and create the right structure to serve the specific purpose.

2.3.7 Challenges with EPMO

An EPMO structure in common with that of a traditional PMO, faces challenges of potential inconsistencies. Similarly, both PMO's may approach project management cohesively and strategically or in a disjointed manner, focussing on individual department projects (Richards 2019). Ramani (2016) showed that implementing the EPMO is not a simple task. Though establishing an EPMO can solve some of the problems, multiple challenges stem from the organisation's level of readiness in terms of culture-changing and the top management's approach and the organisation's degree of maturity. According to Spivak (2019), one of the critical problems facing an EPMO is that its implementation is often recommended by an external institution or consultant agency. Therefore, relevant stakeholders are not consulted in order to gain an understanding of the organisation's unique circumstances. As a critical determining factor, an organisation's preparedness status may not be taken into consideration, and an EPMO is established without the presence of the capabilities necessary to sustain this new structure (Richards, 2010). According to Ramani (2016), failure to determine the organisation's current status concerning present efforts, congruence with overall strategy, resources invested, and the organisation's expected results are among the dominating factors that make the implementation of the EPMO concept difficult or even a failure.

Richardson (2010) argues that an EPMO fails mainly for two reasons, an unclear goal in terms of its establishment on the part of management and poorly defined reporting channels. Since it is not easy to establish an EPMO in any organisation, the first logical step for this study would be to evaluate such a venture's feasibility within the military organisation.

CHAPTER 3
METHODOLOGY

3.1 Introduction

This chapter provides a detailed explanation of the research methodology used in this study. The chapter commences with the research design and then discusses the methodology, sampling technique, data collection instrument, data collection strategies, data analysis procedure, strategies implemented to maintain the instrument's validity and reliability, and ethical considerations.

3.2 Research Design

There are mainly two approaches to research projects, namely, qualitative and quantitative research methodologies (Bryman *et al*., 2016). This study used a qualitative research design which provides an extensive, detailed descriptive narrative of a phenomenon and helps the researcher capture multiple voices and perspectives (Klenke *et al*., 2016). According to Guest and Namey (2014) qualitative research can probe the participants' responses as the researcher deems necessary and, thus, obtain in-depth descriptions and explanations of their experience, behaviour and beliefs.

In qualitative research, the researcher and participants develop a close relationship making it possible for the researcher to obtain detailed relevant information that is more authentic and intimate than would be possible in quantitative research (Mckenzie, 2019). However, it must be acknowledged that qualitative research has its limits due to the researcher’s preconceptions and the subjective nature of qualitative data and the difficulty experienced when applying standard reliability and validity concepts (Skinner *et al*., 2020). Qualitative research is criticised for its subjective nature on two fronts. On the one hand, qualitative research cannot be replicated because people's beliefs, views, ideas, values and attitudes differ from one situation to the other and from time to time. Therefore, since their beliefs, views, ideas, values and attitudes are based on nationality, culture and life experience, these notions are likely to be different from one location to another. Subsequently, qualitative research findings are generally bound to that specific setting, and it may be hard to generalise these results to other settings.

In addition, qualitative research is criticised for lack of scientific thoroughness and credibility because the process can be affected by the researcher's values and beliefs. Although these weaknesses are legitimate and genuine, they can be neutralised in order to give the study's findings credibility. In the first instance, this study does not aim to provide statistical data on which to draw generalisations but rather to apply logical generalisation through careful consideration of similar settings and contexts. Furthermore, it is common cause and well acknowledged that the researcher's subjectivity is ever-present during all research processes and may affect the study's findings. Therefore, since both the researcher and the participants are aware of the possible biases, the findings are understood from that perspective. However, qualitative research's primary focus is on the degree to which the researcher is transparent in detailing the process followed in collecting data, analysing and presenting the results (Ellis, 2018). Therefore, this study's researcher has provided a transparent process of collecting, analysing and presenting the collected data. Moreover, these research findings should be understood in the right context and can only be generalised to a similar setting and context.

3.3 Research Methodology

The research methodology chosen to support the critical research question "What is the feasibility of establishing an Enterprise PMO for a military organisation" is that of semi-structured interviews. Semi-structured interviews are a common type of research instrument that differs in its form (Leavy, 2014). Nair *et al*. (2020) describe a semi-structured interview as a data collection vehicle that has mainly predetermined open-ended questions and allows the researcher to formulate other questions during the discussions between the researcher and the participants to gain further insight into the study topic. A major disadvantage of semi-structured interview is that the researcher may use certain questions to influence the participants' views and limit their freedom of expression (Nosiri, 2019).). To counter the disadvantage of semi-structured interview, the researcher has reviewed the relevant research literature and the DAP handbooks. The researcher has reviewed and applied relevant interview techniques and allowed participants to express themselves freely during the interviews. Furthermore, any 'grey areas' during interviews were verified with the available policies covering the area of discussion, and 'puzzling' information was clarified with participants (Flick, 2018). A well-structured interview provides the flexibility required to address all

identified research problem areas and offers participants an opportunity to give new meaning to the study topic (Galletta, 2013).

3.3.1 Sampling technique

Sampling involves selecting participants from the population to participate in the study (Rahi, 2017). Bryman *et al*. (2014) point out that sampling aims to collect data that reflects the perceptions of the entire population. According to Braun and Clarke (2013), qualitative research sampling commonly involves selecting subjects or data based on participants' characteristics or experience. The researcher selected participants from the PMOs and DMDs within the various Arms of Service of the military organisation. The sample was a selected population across the project management discipline within the organisation's middle management.

This study adopted purposive sampling; a non-probabilistic technique used to strategically select participants capable of answering the research question (Bryman, 2016). The researcher selected participants with at least three years' experience within middle management. According to Leedy and Ormrod (2015), purposive sampling of five (5) to twenty-five (25) participants is suitable for the researcher's intended study. Consequently, for this study, ten (10) participants were interviewed. The researcher targeted this number of participants based upon the timelines allowed in the academic calendar for this management level. Project Officers and a Project Administrator who have worked within project environment for more than 3 years were selected.

3.3.2 Research Instrument

The semi-structured interview was designed using information obtained from the reviewed literature. Personnel from both the PMOs and DMD were interviewed. The interview questions (see Appendix I) sought to obtain relevant information concerning the state of military organisations' PMOs and details of the DAPs and DMSs to determine their readiness for establishing the Enterprise PMO. The questions were divided into different categories, in order to answer the critical research questions, as set out in *Table 2* below.

Table 2 Data collection instrument design

Research Objective	**Data Collection Instrument**	**Justification (What the instrument aims to achieve.)**
To get the background of the participants	Question 1, 2, 3 and 4	These questions were used to determine the respondents' level of education, training and role in acquisition process.
To determine the project management process within each PMO during acquisition management within the military organisation.	5, 6, 7, 8, 9 and10	These questions were used in order to understand the DAP and the involvement of the PMO in this process.
To establish the building blocks that need to be in place for implementing an EPMO.	11, 12, 13, 14 and 15	These questions were used to understand the role, structure, and challenges facing the PMO.
To determine the readiness level of the military organisation for establishing the Enterprise PMO.	16, 17, 18, 19 and 20	These questions were used to understand how the Enterprise PMO can benefit the military organisation.
To determine the readiness level of the military organisation for establishing Enterprise PMO.	21 and 22	These questions were used to establish the benefits of an Enterprise PMO and to promote the particpants' support for its implementation.

3.3.3 Data Collection Strategy

According to Kabir (2016), primary data is collected first-hand from the subjects and secondary data sourced from existing relevant literature. Generally, a researcher spends considerable time collecting secondary data from the literature and then moves on to collecting primary data (Masmoudi & Al-Aa'li, 2020). This study initially obtained relevant secondary

data from books, articles, journals and dissertations to form a baseline for comparing this information with the primary data collected through the semi-structured interviews.

The semi-structured interviews sought to better understand the project management process operating within the DAP and to identify current project management challenges. The semi-structured interviews were conducted with five (5) Project Officers, one (1) PMO manager and one (1) PMO Administrator working at a Arm of Service's PMO. A further three (3) senior officers from the DMD were interviewed. The interviews were conducted in the participants' offices, and although they were set to last 45 minutes, on average they lasted for 55 minutes due to the researcher's prompting to clarify certain responses. The interviews were audio recorded with the consent of the participants.

The participants were informed of the study's aims and objectives before the interviews which were conducted between 22 October and 10 November 2020 in a face-to-face manner in the participants' offices. The participants were provided with an information sheet explaining the purpose of the research, the researcher's expectations and the proposed dates and duration of the interview. The interviewer indicated that participation was voluntary and that participants could withdraw at any time. It was explained that their confidentiality would be protected and permission to audio record the interviews was requested. Prospective participants were informed that there was no financial incentive for participating in the research project and were then asked to sign the consent form documenting their willingness to participate.

According to Abele and Charak (2020), the Covid-19 pandemic has pushed organisations to change how they conduct business, and this situation has also affected how face-to-face interviews are now conducted. The challenge with conducting face-to-face interviews during the Covid-19 pandemic was mitigated by wearing of face mask, keeping a 1.5m social distance between the participant and the interview, plus the fact that the interviewer always carried a bottle of hand sanitiser (Assey, 2020).

3.3.4 Data Analysis Strategy

Thematic analysis was used to analyse the data collected from the semi-structured interviews, for the purpose of identifying and analysing patterns found in the qualitative data (Braun &

Clarke, 2013). The six steps described by Braun and Clarke (2013) were used to analyse the data as follows (1) familiarisation with data (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes and (6) producing the report. As outlined by (Kitzinger, cited in Wicaksono & Zhurauskaya, 2020), the two main advantages of thematic analysis are that it is useful for systematically organising the data and for informing the researcher collating the evidence. Also, one can use this type of analysis for summarising critical recurring themes in the data. However, Javadi and Zarea (2015) have warned that thematic analysis is prone to human error and, thus, the researcher may easily misinterpret the data, formulate inaccurate findings and draw the wrong conclusions. As suggested by McGrath (2019), the researcher started the task of analysing data before the completion of all the interviews so as to become more aware of emerging themes and categories.

All the interviews were transcribed manually from the audio recordings of the semi-structured interviews into MSWord documents. The researcher repeatedly listened to the audio recordings and updated the word documents to confirm the transcription was an exact version of the recorded interview. During the transcription process, the data was coded manually, allowing the researcher to become familiar with the data set. The researcher analysed the data acquired from the first five interviews and scrutinized each theme before proceeding to examine the responses to the last five interviews. The transcripts were uploaded onto the Nvivo 14 days of free trial qualitative research software, for more analyses. Each interview was then recoded using the same software and compared to the initial manual coding version.

3.3.4.1 Familiarise with Data Phase

Following Braun and Clarke (2016), the researcher ran a word frequency query through Nvivo 14 to identify possible initial themes. This computer program created the ‘most commonly used words’ list, which helped the researcher generate the ‘word cloud’ shown below in Figure 9.



Figure 9 Word Cloud from Nvivo 14

3.3.4.2 Coding Phase in Nvivo 14.

The ten (10) interview transcripts were read again and codes were created. These codes were exported to a word document, printed, analysed and manually compared with the original transcripts to ensure that all possible codes were covered. The resultant Code Report appears in the Appendices at the end of this thesis.

3.3.4.3 The Final Stage

Deductive thematic analysis was used, the codes were merged and a comparison of the differences and similarities compiled and themes that could be combined to form one theme were identified. The consequent emergent themes are presented in the next chapter.

3.3.5 Validity and Reliability

Validity is defined as the degree to which researchers have measured what they want to measure (Singh, 2019). According to Leedy and Ormrod (2015) validity will be enhanced by consulting

the relevant research literature in search of the measurement techniques that others have used effectively. Moreover, they suggested that consulting experienced colleagues for feedback and advice on the initial draft helps to enhance validity. In this study the issue of validity was addressed via the use of multiple data sources (interviews and archival data) together with the literature review framework as a guideline for the data collection process.

Grimsholm and Poblete (2010) suggested that the interviews should be recorded and, after the transcription, the information forwarded to the participants for approval. This process would increase validity by eliminating the risk of the researcher misinterpreting the data. For this study, the researcher recorded and transcribed all the interviews. Upon completion of the transcriptions, the written records were sent to the participants for review and approval and all were ratified and returned.

Reliability is defined as the extent to which the collected and analysed data can be repeated to provide consistent results (Yim, 2014). According to Merriam and Grenier (2019) reliability relates to instrumentation and because the researcher is both the data collector and analysist, reliability can be enhanced through the researcher's training and practice. In this study the issue of reliability was addressed as follows:

i. Triangulation. Use of multiple sources of data (interviews and archival data) and the collection method.

ii. Investigator's position. The research provided details pertaining to assumptions, worldviews, biases and theoretical framework that may affect the investigation.

iii. Audit trail. A detailed account of the process and procedures that the researcher followed when collecting and analysing data, how the different themes are derived and the results are obtained.

Credibility is concerned with the truthfulness of the research findings (Korstjens & Moser, 2018). This characteristic focuses on confirming that the research findings are drawn from the data that was sourced from the participants and that the participants' views were correctly interpreted. The study was conducted in accordance with best practice in academic research and participants were provided with an opportunity to peruse the findings to confirm that the researcher has accurately comprehended their input during the interviews (Bryman *et al.*,

2014). The outcome of the study was compared with the outcomes of other *Enterpris*e-PMO projects/initiatives as recorded in the literature review to ensure credibility of the study findings. Members who are considered knowledge specialists in the various aspects of the SANDF project environment were selected to be part of the research sample.

3.3.6 Ethical Consideration

According to Iphofen and Tolich (2018) ethical research involves attempting to find a balance between the harmful risks and potential benefits facing the research participants. The researcher collected the data from the military organisation's project management environment; therefore, it was essential for the researcher to obtain ethical clearance. The researcher obtained permission to conduct this research from the University of Witwatersrand's School of Mechanical, Industrial and Aeronautical (MIA) Engineering. Once this was granted, formal permission was obtained from the Military Organisation's DMD's Chief Director, in line with the ethical clearance requirements from MIA School. The researcher obtained this ethical clearance certificate, Protocol Number: MIAEC076/20, on 24 July 2020.

During data collection and analysis, the researcher maintained the participants' confidentiality and anonymity by obtaining consent to their voluntary research participation (Wiles 2013). The same author encourages the researcher not to coerce participants to become involved, thus, respondents in this study were given a participant information letter setting out the research details. Therefore, the findings of the research were analysed in a manner that avoided misstatements, misinterpretation and fraudulent information.

3.4 Conclusion

This chapter described the research design and methodology, including the sampling method of the population, data collection instruments as well as strategies used to ensure the ethical compliance, validity and reliability of the study. The researcher used a qualitative research design in this study comprising the conducting semi-structured interviews with the Project Officers, Project Management Officers in Charge of PMOs and PMO Administrators, all of whom the researcher believes are subject matter experts in the acquisition project management field within the military organisation. The chosen sample expressed their willingness to

participate in the study and their written consent was obtained from all the participants. Permission was obtained from the military organisation and WITS MIA School of Engineering's Ethical Committee. Anonymity and confidentiality were maintained during data collection and analysis. Reliability and validity were further increased by sending transcriptions of the interviews to the participants and requesting them to confirm the accuracy of the data.

CHAPTER 4
RESULTS AND ANALYSIS.

4.1 Introduction

This chapter aims to present findings from the participants' interviews. A total of ten participants voluntarily took part in the study. They were selected from all the Arms of Service involved in the acquisition process. The participants were assured that the interview data will be used solely for study purposes and their confidentiality would be maintained. The comments of the participants were included under relevant themes with, for example, the code 'P2' representing participant number 2.

4.2 Participants' Information

The participants' information is presented using graphs and charts. Further detailed explanations are also provided regarding the participants.

4.2.1 Gender

The study involved Project Officers and Portfolio Managers from the DMD and Services PMOs. The sample includes ten (10) participants, of which one (1) was female and nine (9) males. The under representation of women did not affect the results of the study. Gender representation is detailed below in Figure 10. Participants' Gender.

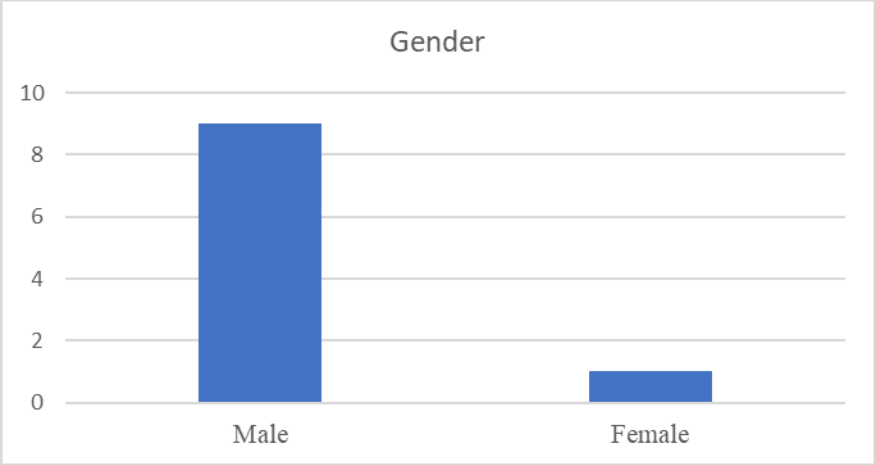


Figure 10. Participants' Gender.

4.1.2 Experience

The participants' years of experience in Defence Acquisition Project Management varies, with 1/10 has more than 20 years' experience, 4/10 have between 10 and 15 years' experience, 3/10 between 5 and 10 and 2/10 have between 1 and 5 years' experience , as depicted in Figure 11 below.

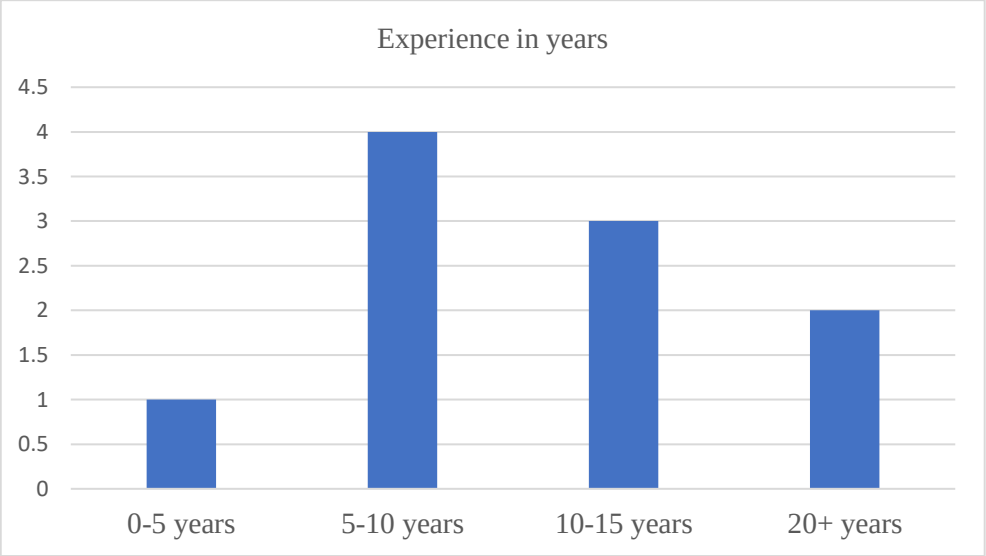


Figure 11: Experience in years.

4.1.3 Level of Education

It was evident that an academic qualification or a project management short course from a tertiary institution is not a requirement to work in the DoD project environment. 2/10 of the participants have a master's degree in project and programme management, 3/10 have attended short courses in project management, 3/10 have degrees unrelated to project management and only 2/10 had no tertiary qualifications. In total, 5/10 of the participants have project management qualifications and thus implied that they could easily understand and answer the questions. The educational qualifications of participants are represented in Figure 12: Qualifications below.

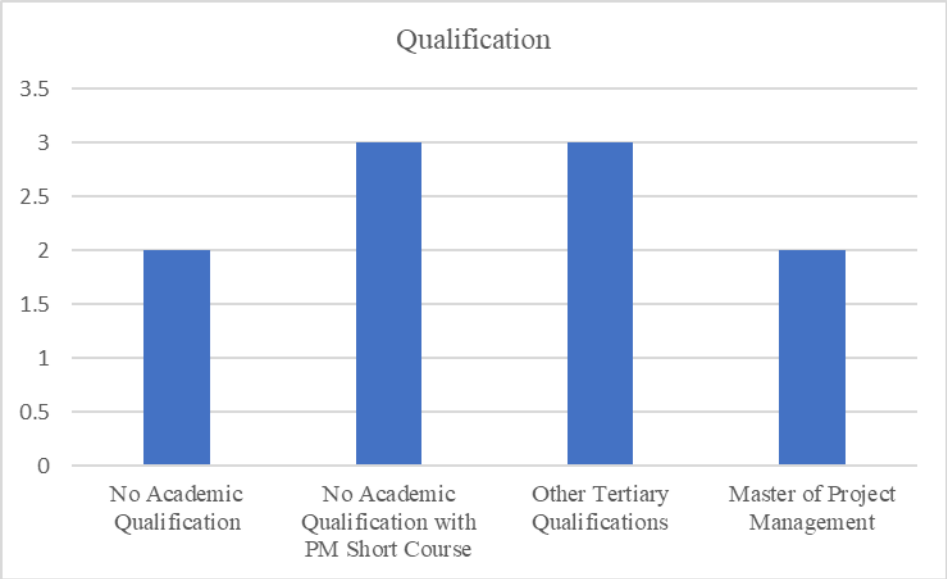


Figure 12: Qualifications

4.3 Emerging Themes

In analysing the semi-structured interview data, the information that is relevant to the study was extrapolated and separated from the other comments. The codes were created using Nvivo 12 to label each category of related information. The researcher further examined these codes to develop themes and sub-themes as indicated in the tables below:

Theme 1: Career Management: this includes the following sub-themes: the level of training, mentoring, and coaching, and employee retention and staffing.

Table 3 Career Management Theme

Main Theme	**Themes**	**Example of interaction from transcript extract**
Career Management	Level of Training	"They are clearly defined in a handbook. But I think more formal training need to be given to people in the project environment" P2
	Mentoring and Coaching	"skills, and knowledge from my experience within ARMSCOR is limited in this specific field ARMSCOR relies on a lot on the knowledge from the Department of Defence." P10
	Employee Retention and Staffing	". Unfortunately, personnel are staffed by arms of service" P6

Theme 2: The Defence Acquisition Process: the understanding of the process, the complexity of the process and the duration of projects.

Table 4 The DAP Theme

Main Theme	Themes	Example of interaction from transcript extract
The DAP	Complexity of the process	"It is defined in the handbook, but it is very difficult for a person who does not have experience in the environment to understand…"P8
	Duration of the project	"I am mandated on started in 1996 so now you are asking how long it will take. I am delivering the product in 2024." P9
	Knowledge of process	". Unfortunately, personnel are staffed by arms of service" P6

Theme 3: Project Management Methodology

Table 5 Project Management Methodology Theme

Main Theme	Themes	Example of interaction from transcript extract
Project Management Methodology		"I think, let me say its SWOT analysis. Some do balance score cards, that is how they manage their projects."P4 "We use this project management method and procedures are written up in the DAP 1000, everything that we need to know about project management."P5

Theme 4: Project Management Structure

Table 6 Project Management Structure Theme

Main Theme	Themes	Example of interaction from transcript extract
Project Management Structure		"I will say we do have our PMO is DAFA, all things are reported there, Finances, everything. Director is the one in charge." P4 "This is Simon's Town Project Management Office. They call it POST- Project Office Simon's town." P2

Theme 5: Project Management Function: Standardisation, flow of information and cohesion amongst the Arms of Services PMOs

Table 7 PMO Function Theme

Main Theme	Themes	Example of interaction from transcript extract
PMO Function	Standardisation and flow of information	P5: "I do think so. Because the DAP 1000 is prescriptive, you do not have a choice you cannot use your own format."
	Cohesion amongst the various Arms of Service	P2: "We have our Navy Projects that are coming up but in isolation, in silos and we find out later, [that] we were supposed to have catered for them to integrate somewhere back there and we find that it's too late and we use money now to [achieve] interoperability between these projects at a later stage. It's because the Navy is here, Airforce is there and Army somewhere else."
	Enterprise-wide resource utilisation	P7: "The project that I was on started in 2002, they run the same project for DoD, they finish it in 18 months, UK in 18 months, France finishes theirs in18 months."

Theme 6: Support for Enterprise PMO, establishing Enterprise PMO and its perceived benefits

Table 8 Support for Enterprise PMO Theme

Main Theme	Themes	Example of interaction from transcript extract
Establishment of an EPMO	Support for the establishment	"If you cut out the managerial link of each director and centralised it, is not impossible but it depends on how many projects is ran by that centralised body, I will say it's definitely possible." P9
	Perceived Benefits	"I don't know. It also will cut out duplication. So, it is really good for duplication because you will not have four different areas that does their own thing. It could save on budget costs, maybe on office equipment and things like paper stationery, because if it is procured jointly, maybe we can get it cheaper buying bulk. So yes, there is a lot of positives to having a joint office, maybe not so much for Acquisition for the product itself to the user."P6

4.4 Conclusion

The different themes were identified using Nvivo 12 to address the stated study objectives. Themes 1, 2, 3 and 5 address the first objective of this study, which is to determine the effectiveness of the PMO within the military organisation. The second objective, which is to establish the building blocks that should be in place for implementing an EPMO, is addressed by Themes 3, 4 and 5. The final objective, namely, to determine the readiness level of the military organisation for establishing the EPMO, is addressed by Themes 1, 3, 4, 5 and 6.

CHAPTER 5
DISCUSSION

5.1 Introduction

In chapter 4 various themes and sub-themes were identified from the data collected during the interviews. To draw some deduction, these themes will be discussed and analysed in details using the literature presented in chapter two.

5.2 Career Management

The purpose of this discussion is to explain the Project Officer's career management from the perspective of both participants and the reviewed literature. According to the reviewed literature, staffing is one of the critical success factors for an EPMO to be effective. The EPMO should be staffed by personnel with both project management expertise and business acumen (Patel *et al*., 2012; Rathore, 2010). The EPMO relies on skilled staff to ensure that it delivers the organisational goals (Sandhu *et al*., 2019).

5.2.1 Level of Training

It is crucial to determine the level of training needed to develop the set of competencies for the PMO professionals who are required in the organisation. An EPMO ensures that PMO staff at all executive, middle and supervisory management levels are trained to understand and perform their functions in order to ensure the successful execution of projects (Andrews, 2014).

Half of the participants (5/10) believe that the four-week in-house Project Officer's course, which introduces the Project Officer to the Defence Acquisition Management process, is sufficient to equip them to work in the DoD's acquisition projects. The other half (5/10) believes that there should be a pre-entry requirement involving more extensive training experience. Although it is not compulsory to have project management training, Project Officers interested in studying this discipline can pursue further studies in project management-related courses at the state's expense. Some participants (3/10) have completed short courses in Project Management, while others (2/10) have a master's degree in Project Management.

P7: “Here at DMD they run a Project Officer’s course at ARMSCOR where they do Defence Acquisition Handbook. The compulsory one is the PO course at ARMSCOR.”

P4: “We are given chances to do an orientation course, here in the Defence Force. They do not check qualification in terms of project management, and it’s the experience and mustering.”

P8: “Usually, they take subject matter expert and subject matter expert might have matric, but he understands his equipment or his capability but, in this environment, I think definitely there needs to be a set Project Management qualification or something that a person needs of some sort in order for him to do his work. A lot of these people that are working here as PO does not even have Project Management qualification.”

P10: “One of the entry requirements for us in this field within from …acquisition environment, you must at least do the project officer course. Maybe they should consider a pre-entry level requirement in the field in the future.”

The in-house Project Management course is the only prerequisite for a military organisation employee to be appointed as a Project Officer. Further examination of the data interestingly reveals that each Arm of Service has its preference regarding educational training related to Project Management. For example, Airforce participants have university short courses in Project Management; Army participants have formal qualifications such as Bachelor or Masters' degree in Project Management. In contrast, Navy participants believe that the in-house Project Management course is sufficient, and the no further training is necessary.

According to PMI (2021) professional development for project management personnel is not a once-off event but a continuous improvement process. Although technical skills are the core skills for project and programme management, the combination of technical, leadership and strategic business management skills are the cores competences for professional project managers. Furthermore, PMI (2019) asserts that the continuous transfer and integration of knowledge and skills are essential for successful project management. A project manager should contribute to knowledge transfer and expertise and participate in training, continuous development and education, such as gained through tertiary studies and the Project Management Institution’s professional development courses. Herzer (2014) agrees that for PMOs to be effective, they must engage in ‘on-the-job’ or ‘onsite’ training, knowledge sharing

and certification programmes. It is the PMO's responsibility to provide project management education to benefit both the organisation and its personnel.

Although 50% of the participants have obtained PM training, the study findings indicated that the majority of them were not engaged in continuous development in project management skills. The DoD's organisational culture does not seem to foster continuous development, skills transfer and certification. It is critical for personnel to have a career structure to ensure the growth and development of the organisation's Project Management's capability. For a career path to be meaningful, it must have three well-defined activities, namely experiential requirements, educational requirements (knowledge) and documentation (Dinsmore, 2014).

5.2.2 Mentoring and Coaching

The EPMO's responsibility is to provide support, mentorship, and training to enable their staff to make a meaningful contribution to the organisation (Pakdaman, 2019). It is important to have project managers who have project management experience and skills as well as soft skills such as coaching and mentoring their team members' talents (Thompson, 2019). When staffing the EPMO, there are three main categories of employment: the appointment of new or existing employees into vacant positions, co-opting temporary employees from within the organisation through the matrix structure and engaging contract employees for skills that are not available within the organisation (McCormick,2016).

Most study participants (6/10) are of the opinion that they have a mentorship programme within their specific Arm of Service, whereby new staff members are initially assigned as an Assistant Project Officer before or after the introduction course. They work together with a Project Officer and, after gaining the relevant experience, they are appointed as a Project Officer. Project Officers mentor each other within their specific Directorates and Services' PMOs.

Moreover, most participants (8/10) are of opinion that there is a sharing of responsibility between organisational POs and ARMSCOR Programme Managers. The PO relies on the ARMSCOR Programme Manager's skills and knowledge. One participant thinks that the ARMSCOR Programme Manager relies on the DoD PO and that ARMSCOR's knowledge is limited in this field. Another participant is concerned that should a PO return to their particular

Arm of Service, and it happens that the ARMSCOR Programme Manager resigns, there is a loss of knowledge for that particular project.

> P9: "…although the ARMSCOR side they must help me to get certain things in order because the process is very interlinked between Defence Force and ARMSCOR."

> P6: "I think among themselves project officers, the project office gives environment, and we have got fourteen projects active now. So, these fourteen other projects have so thirteen that can mentor each other."
> P5: "so, the is opportunity for young officers to become mentored into by working on a project, which happens quite a lot in organisations."

> P3: "And then usually what happens is they are meant to be allocated to a project for mentorship."

Mentoring and coaching seems to occur on an informal basis within the PMOs in the different Arms of Service and Directorates but not across other Arms of Service. Most POs perceive the ARMSCOR Programme Manager as possessing expertise necessary for mentoring the DoD staff in the project management. Aziz (2014) mentioned that one of the Project Management Office's functions is to provide mentoring and coaching to support its Project Managers. Taylor (2016) agrees that mentoring and coaching are important functions of the PMOs.

5.2.3 Retention and Staffing

Appropriate PMO staffing is one of the critical success factors for an EPMO to become effective. PMOs should be staffed by employees with both project management expertise and business acumen (Patel *et al*., 2012; Rathore, 2010). The EPMO depends on skilful staff to achieve its organisational objectives (Sandhu *et al*., 2019).

Most participants (8/10) indicated that the PO personnel are assigned from other areas within the various Arms of Service. The end-user assigns a subject matter expert from the system environment to the PO. One participant believes that the subject matter expert should not be a PO but should guide the PO. Other participants (2/10) stated that they are being 'matrixed' into the projects and are still required to perform duties within their Arm of Service. Furthermore, (2/10) participants indicated that the DMD should be staffed with experts that have managed projects or have project expertise.

Half the participants (5/10) mentioned the low retention of skills created when PO are recalled to their particular Arm of Service. One respondent highlighted a high staff turnover due to attractive salary packages in the private sector.

> P10: “I think the staff turnover should be minimised.”
>
> P7: “Availability of staff, you do not always have staff and you lose a lot of expertise, if people get transferred you lose a lot of expertise.”
>
> P6: “Unfortunately, personnel are staffed by arms of service.”

These findings reveal that some PMOs are not staffed on a full-time basis but assigned personnel from the appropriate Arm of Service for the project's duration. Some POs are still performing their functional duties and carrying out their project duties as an additional task. The low retention of skills occurs when these POs are withdrawn from projects, transferred within their Arm of Service or resign. Subsequently, there is a high staff turnover rate.

Kupec (2013) asserts that it is critical for the DoD’s Project Managers to possess operational knowledge of the technology involved in their projects. The Defence industry requires specialised project management certification designed to meet military requirements. When a department within an organisation embarks on a project, it is logical that members of the department's staff are appointed to manage it. The challenge with this approach, however, is that the department may lack specialists. Moreover, some departmental staff members are appointed temporarily to the projects but perform these duties over and above their specified job-related tasks, leading to delays in project management decision-making (Kupec., 2013).

The finding that some POs have the dual responsibility of reporting to both their Arm of Service and their allocated project, agrees with the findings expressed in the reviewed literature. Furthermore, Söderlund, *et al*. (2012) suggests that a reduction in staffing levels within the PMOs raises concern about the loss of expertise and specialised knowledge. Therefore, these findings support the views delineated in the literature review in terms of project management staffing and skills retention.

5.3 Defence Acquisition Process

One of this study's objectives was to determine the project management processes within each PMO during acquisition management within the military organisation. The literature review was conducted to determine the nature and quality of project management in the acquisition management process. The research participants were asked questions concerning defence acquisition management to determine the complexity of the process, duration of the projects, knowledge of the process and the process flow. The process flow is highlighted below in Figure 13: Defence Acquisition Process Illustrated by Participants.

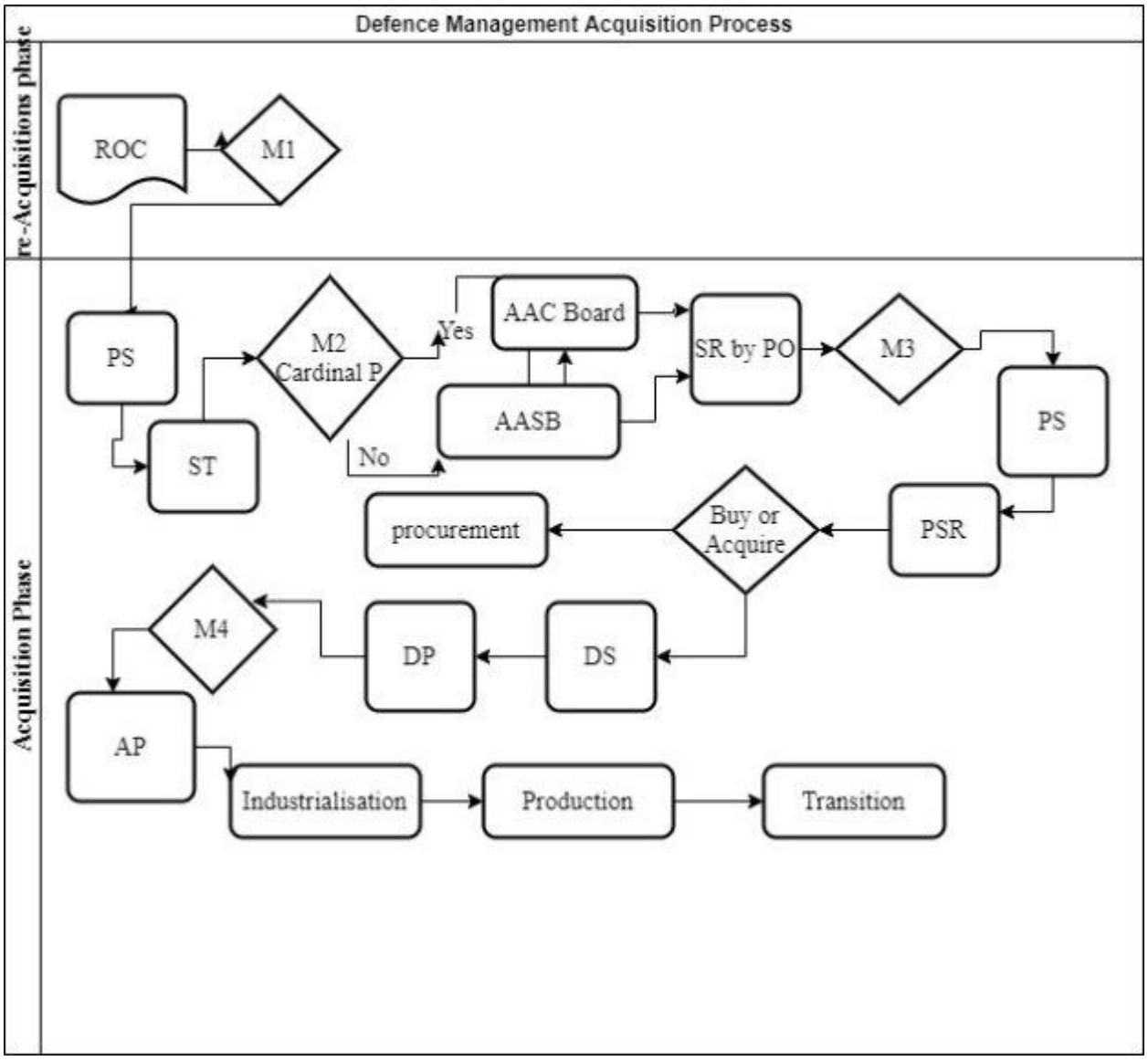


Figure 13: Defence Acquisition Process Illustrated by Participants.

5.3.1 The complexity of the Acquisition Process

The DAP has become a multifaceted operation and has not always produced systems that meet the expected costs or required performance (Darrin & Stadter, 2017). According to Erenel and Eren (2018) and Schwartz (2014), the DAP is highly complex and technical. It involves establishing and understanding the context in which the people, technology and materials are jointly deployed in pursuit of the country's political and societal goals (Jenkin, 2015). This process converts military needs and available technologies into existing military weapon systems (Serafini, 2017).

Some research participants (4/10) are of the view that the process is easily understandable. In contrast, one participant believes that the process is very complicated. The other (2/10) participants believe that the comprehension of the process depends on one's commitment and experience with the process. They also highlighted that although it takes time to be acquainted with the process, it is not difficult to comprehend. Furthermore, the POs' additional responsibilities in their respective Arms of Service may add to the complexity of the process.

> P9: "If you work with it, I believe it is, but if you are a civilian, you are going to struggle. Because I did a PPM, we are not totally aligned with PPM outside in our process."

> P8: "It is defined in the handbook, but it is very difficult for a person who does not have experience in the environment to understand. We have a lot of baseline, a lot of milestone document, it is clearly defined in the book in Defence Acquisition handbook, it's a very complex process before you start the next milestone, you need to go read and try understanding something and think something totally different, which makes interpreting such difficult."

> P2: "If you are focus in the project, I think one year is comfortable to make everything, it's not rocket science."

These findings indicate that some participants find the process very complicated, while others believe that the process is easy to comprehend and master. The apparent contradictions can be explained by the fact that those who find the process simple to understand have more experience and exposure to it. This view is consistent with the reviewed literature, which

indicates that the various defence acquisition processes across the world are very complex, necessitating the employment of skilled and experienced staff in such an environment.

5.3.2 The Duration of Acquisition Process

It is accepted that the duration of an acquisition project is determined by its complexity and the availability of easily accessed technology. Acquisition projects may take a few years, while a major system development typically takes 7 to 10 years (Van Atta, 2013).

Most participants (6/10) demonstrated that the acquisition process is extensive. Various statements by these participants highlighted a prolonged period for such projects. One participant indicated that in countries such as the USA, UK and France, they are able to complete projects in 18 months and the same projects take the South African military organisation 20 years to complete. Another participant believes that an acquisition project's average duration is 5 to 7 years, which does not seem to be the case in their environment.

> P6: "……the USA, they run the same project for the DoD, they finish it in 18 months, UK in 18 months, France 18 months. We run the same thing for 20 years."

> P9: "I am mandated on started in 1996 so now you are asking how long it will take. I am delivering the product in 2024."

> P8: "It is very length process, and you will see a lot of these projects run up to 20 years. With technology if you start something today, you might not need that thing you started acquiring 20 years ago."

SA's DoD acquisition process is lengthy, as demonstrated by the participants, and the reasons for this situation are beyond the scope of this study and so were not probed sufficiently to produce findings. However, this study has established that SA's DoD acquisition process is lengthy and heavily detailed when compared with those operating in the UK, USA and Australia. The Australian acquisition process is much leaner, with generally two approval phases (sometimes three, depending on IC/JCN decision). Similarly, the USA and UK systems have only two approval gates. The SA Defence acquisition process has to be approved by numerous boards, namely the OSC, MCC, AACB, AASB and AAC.

5.3.3 Knowledge of the process

According to some authors (Erenel & Eren, 2018; Schwartz, 2014), the DAP is highly complex and technical. All the participants agree that the DAP is based on the DAP 1000 policy handbook and these assertions agree with the (DAP ,2019).

Generally, most participants (9/10) agree that at the start of the acquisition process flow a feasibility study is conducted, leading to staff targets being presented at ACC if it is a cardinal project and at AASB for non-cardinal projects. After that, the PO is appointed to oversee the acquisition of the staff requirements, resulting in the formation of a Project Study. Some participants (2/10) indicated that they receive assistance from CSIR with the concept development within their environment. The Project Study report is presented at various forums where a decision is taken to either buy the commercial/military requirements off the shelf through the normal procurement process or acquire the equipment through a Project Management system. In that type of acquisition case, the process continues with the Development Study, Development Plan and Acquisition Plan. Then, the process continues through the Production, Transition and Closure phases of the project.

5.3.4 Process Flow

The DAP differs to a certain degree from country to country. Most participants (8/10) agree that the ROC is initiated at the user domain. Once it is approved at the MCC level, it is sent to the DMD for the Acquisition Management process. One participant indicated that the ROC is approved at the Joint Operations environment. In contrast, another participant is of the view that ROC comes typically from the CJ Ops environment. There is no consensus regarding on what the ROC is based. Some participants (6/10) are of the view that any person can raise a ROC, based on the shortcoming identified in the user environment. Some participants (2/10), however, believe it is based on both shortcomings and DoD strategy. At the same time, another participant stated that the ROC arises from both strategy and the identification of a shortcoming.

In the SA DoD the origin of the required operational capability occurs within the user environment from the Chief of Services (defence Acquisition Policy, 2019). This approach is

similar to that of both the UK and USA, whereby the capability needs originate from the four staff commands. In contrast, the Australian approach differs significantly from SA in that IC and JFA in Australia initiate the requirement and task the Service to develop the requirement in such a way that it is in line with the defence strategy and is integrated with the overall defence capability.

From the study's participants' perspective, capability requirements originate from strategic objectives and operational needs and are initiated by the various Services. According to Louth and Taylor (2017), when different Service Chiefs develop their requirements, the primary challenge is that they choose projects that suit their specific Arm of Service without considering their cohesion and integration with the overall defence capability. Therefore, these researchers propose a central joint body for generating requirements.

There is a difference in the acquisition process as stipulated by DoD policy and practice as alluded to by the respondents' comments regarding ROC approval at Joint Operations. In the Defence Policy document, it is mandated that ROC is generated in the different Arms of Service and approved at CJ Ops through OSC, while from the interview data, however, only two participants are of the view that ROC is sent to Joint Operations for approval and to ensure jointness of effort. This finding is contrary to DAP 1000, which states that the Operational Staff Council confirms that the requirement is valid and in keeping with the DoD's strategic objective and prioritising them.

In the Australian Defence Force, the Force Design process delivers the JCN, a starting point for defining the capability gap or opportunity and ensuring that the joint requirements are directly aligned with strategic direction. The Chief of Service is tasked with developing the Joint Capability Needs Statement (JCNS) which details the Chief of Service's approach to solving the challenges detailed in the JCN by explaining the capability requirements and available options (Australian DoD, 2016). The USA has a similar approach wherein capacity requirements are dealt with through the JCIDS process, which is responsible for identifying the US armed forces' capability needs in support of National Security Strategy, National Defence Strategy and National Military Strategy. JCIDS supports the JROC and assists the Chairman of Joint Chiefs of Staff to identify, assess, validate and prioritise the capability requirements. The

JROC consists of Service Vice-chiefs and the Assistant Commandant of the Marine Corps and is managed by a small permanent staff. The JROC oversees the material requirement documentation validation process and emphasises cohesion in the generation of requirements for all major DoD acquisition programmes (Defence Acquisition University, 2011).

Francis (2009) asserts that if the capacity requirements and investment decisions are based on the Services and individual platforms, the DoD cannot adequately deal with the issue of cohesion of the Arms of Service. Sullivan (2010) agrees with these assertions that "Service-driven requirements and funding processes" will always hamper cohesion and effectiveness and result in the undesirable duplication of requirements. A report to the Congregational Committees by the USA Government Accountability Office on the requirements of the DoD Weapon System, found that although the JROC has a joint perspective for reviewing the entire department to ensure cohesion, prioritisation of requirement and eliminate efficiencies and potential redundancies. JROC has failed to prioritise requirements, identify duplications across Services' projects and adequately identify capability gaps (Government Accounting Officer, 2011).

The SA DAP compares favourably with the reviewed countries' processes in respect of the Project Life Cycle's Phase approach, the use of gates and decision points that allow for monitoring of projects throughout the procurement process. The DoD, however, will always struggle to achieve jointness of effort, integration and inter-operability amongst the different Arms of Service as long as the requirements are generated by the Services and cohesion and integration are not considered as part of requirement generation.

5.4 Project Management Methodology

The Defence operations and projects are unique and, thus, the DoD's project methodologies may differ from other organisations' projects. DAP 1000 does not specify what methodologies project management is based upon. There seemed to be a lack of understanding amongst the participants on the project management methodology utilised in the SA defence acquisition projects. Some participants (5/10) believe that the DAP 1000 acquisition policy handbook is the methodology for acquisition project management. One participant indicated that the project management methodology is based on PMBOK, and there is no requirement to register with a

body of knowledge. To some participants (2/10), system engineering is the methodology that is practised. One participant stated that SWOT analysis, while another indicated a critical path is used, and that the waterfall approach is his preferred methodology.

> P4: "I think, let me say its SWOT analysis. Some do balance score cards, that is how they manage their projects."
>
> P5: "We use this project management method and procedures are written up in the DAP 1000, everything that we need to know about project management."
>
> P2: "I see, its DAP 1000 and POSTFIT in terms of System Engineering.".

The traditional project management methodologies (i.e., the systems development life-cycle approach) are considered bureaucratic or "predictive" in nature and have resulted in many unsuccessful projects. EPMO methodologies can assist in improving the project process and deliver a certain level of standardisation and consistency. EPMO methodologies work best when based on the template and not on rigid policies (Herzer, 2018). The Australian Defence Force acquisition process is heavily based on the project management knowledge areas from the PMBOK and sections such as AS21000, ISO55000 and Managing Successful Projects, and the USA policy is also based on PMBOK.

5.5 PMO Structure

Different authors concluded that "*all authors*" suggest either three, four or five PMO models (Monteiro *et al*, 2016). However, Ferreira (2019) believes that there are three to seven types of PMOs discussed in the reviewed literature. Hubbard and Bolles (2015) agree that most PMOs fall under one of seven categories. Ferreira (2019) concludes that three models are recommended for practical reasons though there are between three and seven PMOs types. The author argues that this approach allows different PMOs to appropriately align to the correct hierarchical organisation levels, including strategic, tactical and operational levels. Therefore, the different PMOs include Project/Programme Office, Department PMO and EPMO.

There seems to be no consensus amongst participants as to whether PMOs belongs to the Project Office located in the various Arms of Service or the DMD. One participant believes that the PMO refers to the integrated project team that is formed when the project is approved. Another participant indicated that the Project Office is a structure comprised of support staff, that is located within a permanent PMO. Another participant believes when a project is approved it is

allocated a structure that entails a PO and an Assistant PO. However, this participant believes that, currently, the PMO has no support staff.

> P4: "I will say we do have our PMO is DAFA, all things are reported there, Finances, everything. Director is the one in charge."

> P2: This is Simon's Town Project Management Office. They call it POST- Project Office Simon's town."

One participant from another Arm of Service believes that the Directorate Acquisition at DMD is their PMO. In contrast, other participants (2/3) perceive that their PO is incorporated within the Project Management Office, from where the POs and support personnel operate.

In the other Arms of Service, two participants (2/4) believe that their Project Management Office is the Directorate Acquisition at DMD, and that their PO is just an extension of that PMO. At the same time, the other participants (2/4) believe that the PO and the Project Management Office are the same entity.

The study findings thus indicate that there is no clarity on the level the PMOs in the various Arms of Service or how these offices operating within the DMD function. It is unclear if the PMOs within the Services Arms operate within the Project/Programme Office or Departmental PMO. Similarly, there is no clarity as to the level at which the Directorate PMOs operate within the DMD. It is not easy to understand each PMO's role if its level is not determined or defined. Therefore, it difficult to establish whether the Services PMOs are POs or Departmental PMOs. From the reviewed literature, the PO progresses naturally to a Departmental PMO and then to an EPMO.

5.6 PMO Function

According to Crawford (2010), Pinto *et al*. (2010) and Ferreira (2019) different PMOs perform different functions based on their level. Therefore, the Project/Programme PMO handles only one project of the organisation and functions at an operational level. Although this PMO focuses on a single project, the project is generally large and complex. Departmental/Unit PMOs operate at the department or business unit of the organisation and function at the tactical level and seldom at the strategic level. In comparison, an EPMO manages the corporate enterprises and

functions at the strategic level. The EPMO focuses on ensuring that projects align with the organisation's corporate purpose, vision, mission, and strategic direction.

This study will discuss the standardisation process, cohesion amongst the services, and the utilisation of enterprise-wide resources under the PMO function.

5.6.1 Standardisation of the Process

Enterprise-PMO should ensure the standardisation of processes (Patel *et al*., 2012; Rathore 2010). It drives consistent use of project management processes, works with the PMOs to facilitate and execute projects and ensures that the project management framework application is flexible. It should hold the local PMOs accountable for the following standards: driving the use of metrics to make better decisions, providing a portfolio view of the business' projects and resource needs, and evaluating the level of project management maturity (Martin, 2016). The EPMO provides integration of PMOs across the organisation with standardised processes.

All study participants agree that the process is standardised across all Service PMOs since it is based on the DAP 1000 handbook. However, it is evident from the participants responses that there is no coordination between the various POs. Some participants (4/10) indicated that they are not sure if there is coordination between POs. Some participants (2/10) indicated that they do not coordinate their operations with other Services' POs. However, four participants indicated that coordination occurs at the DMD Level.

> P8: "I do not know how effective it is, but I do know that in DMD staff there is coordination that helping amongst other but not at Project Office level."

> P9: "You must check the DMD structure, we try to interact within one another, so it's not impossible."

The military organisation relies on the policy DAP 1000 to achieve standardisation, coordination, and consistency. There seems to be no collaboration and coordination amongst the Services' PMOs. The reviewed literature, however, suggests that organisations will not achieve standardisation through rigid policies but via structure, consistent and standardised processes, methodologies, tools and collaboration and coordination. The EPMO provides the much-needed governance framework structure, consistent and standardised processes, methodologies and tools for the departmental and/or division PMOs and eliminates the

challenges resulting from lack of collaboration and coordination. EPMO methodologies can assist in improving the project process and deliver a certain level of standardisation and consistency, however, these methodologies work best when based on templets and not on rigid policies (Herzer, 2018).

5.6.2 Cohesion and Integration

There is a growing need to reform the acquisition process to ensure cohesion and integration with other services, government departments and supportive forces (Ryan & Soutberg, 2016). Both the USA and Australia have undergone significant reformation of their acquisitions processes as a result of challenges arising from a lack of cohesion, cooperation and inter-operability of the various Arms of Service. In Australia, there is a single body responsible for force design, strategic capability guidelines and ensuring the cohesion and integration of the force and prioritisation of capability investment. There is a realisation that defence projects do not occur in isolation but, as part of the overall capability, inter-operability is required with the other Arms of Service and supportive forces (Bennett, 2010).

An EPMO's role expands that of a traditional PMO in that it aligns individual projects and portfolios to the strategic objective. There was no consensus amongst the study participants regarding who is responsible for the cohesion, integration and inter-operability of the Services' acquisition projects. Some participants (4/10) think that the Chief Director Material Acquisition Management ensures cohesion between his Directors. Other participants (2/10) believe that it is the Joint Operations' responsibility to ensure cohesion of effort. One participant stated that cohesion is ensured at a point in the higher level, and another indicated that is it ensured by one of the many forums at which project milestones are approved. Of the remaining two participants, one believed that no single specified entity is responsible for ensuring cohesion of effort, while the other participant does not know who is responsible for cohesion.

> P4: "I think it is centralised of which in this case Chief Director DMD, under him there are Directorate (Army, Navy, Airforce, common weapon) there are meetings where they meet that where they ensure cohesion."

> P2: "We have our Navy Projects that are coming up but in isolation, in silos and we find out later, we were supposed to have cater for them to integrate somewhere back there and we find that it's too late and we use money now to interoperability between these projects at a later stage. It's because the Navy is here, Airforce is there and army somewhere else."
>
> P10: "CJ Ops at the end of day, and the higher level, he has been responsible to ensure that there is no duplication of effort in terms of Army Air Force Navy and SAMHS."

Although Joint Operations is the body that ensures cohesion according to the DAP 1000 policy (Defence Acquisition Policy, 2019), only two (2/10) participants knew of this critical role. According to Francis (2009), as long as the capacity requirements and investment decisions are based on Arms of Service individual platforms, the DoD cannot adequately deal with the issue of their cohesion. Sullivan (2010) agrees with these assertions that "service-driven requirements and funding process" will always hamper cohesion and effectiveness and, consequently, result in undesirable duplication of requirements. A report to the Congregational Committees by the USA Government Accountability Office on the DoD's Weapons System's requirements, found that although the JROC exhibits a joint perspective for overseeing the entire department to ensure cohesion, prioritise requirement and eliminate efficiencies and potential redundancies. JROC has failed to prioritise requirements, identify duplications across Services' projects, and adequately identify capability gaps (Governent Accounting Officer, 2011). Sullivan (2011) has criticised the DoD because it has not adopted the Portfolio Management Approach to the capability investment, which would allow for the integration and prioritisation of capability and resources to eliminate duplication.

Therefore, it is not surprising that most participants (8/10) struggled to explain cohesion and were unaware of the specific institution responsible for the cohesion and integration of the acquisition system. From the reviewed literature's perspective, it is usual for military organisations that generate capability requirements from the various Arms of Service to struggle or fail to ensure cohesion and integration of programmes through the elimination of inefficiencies and redundancies. Therefore, the findings of this research are consistent with those of existing literature.

5.6.3 Enterprise-wide Resources Utilisation

One of the many benefits of the EPMO is centralised and coordinated resource management. According to Koh and Crawford, as cited by Pakdaman (2019) the information system development assists the EPMO to effectively store and share documents, data, information and reports. The effectiveness of the EPMO teams depends on their ability to work together in a collaborative manner facilitated by a fast and accurate communication system (Metuge, 2015)

Most participants (7/10) indicated their department had no formal platform for sharing information, knowledge and lessons learnt. Two participants stated that there are platforms for the project management teams through which the PO could receive feedback. One participant had no knowledge of such a platform. There was an Intranet (website) created for DMD personnel about three months before the study interviews were conducted. However, only (3/10) participants are aware of this communication medium and are unsure of its purpose. Most participants (7/10) are unaware of any systems through which that they can access project management knowledge. One participant believes that there is an opportunity for learning basic software lessons and that some form of PINT tool has been created.

Some participants (4/10) indicated that they believe that the DMD directors advise their Chief of Service on the projects, and that the Chief Director DMD advises the CSANDF and CJ Ops. One of the participants stated that the project is visible at the Strategic Capability Acquisition Management (SCAM) level. Another participant mentioned that the Chief Director, the Secretary of Defence or a Minister, prioritises the projects.

> P2: “Maybe there is, but I have not seen any, but should you need help, what I have realised any Project Officer is willing to share important but there is no bank where we can access such information maybe because of the nature of and sensitivity of any project.”

> P3: “There's no tool that I can share with my army colleagues, or that type of thing. however, I do talk to the Project Officer, yes. And I said to him. I am having this challenge. How did you overcome it? Or there's this document.”
>
> P6: “Yes, that is on a SCAM, Strategic Capital Acquisition Master plan, so the entire Defence force is listed there with all projects, and each arm of service will have its own prioritisation and at strategic level, the defence force will decide, project x is contracted.”

> P6: “That's very good question. Because everybody wants priority for their own product. I am sure when the requirement that requires operational capability go to Chief of Defence Force, and this is maybe at the Military Command Council, Defence Staff Council……. I am sure that the Chief of Defence Force, Secretary of Defence or the Minister would know what the priority for that is.”

From the participants’ responses one can make deductions that there is no specific tool that is used to communicate project information and lessons learned. Without an adequate platform to share project information, it will be difficult for PMOs to communicate with each other and encourage collaboration. The EPMO keeps a record of projects’ historical data and lessons learned to facilitate training to lessen the complexity and anxiety of the unknown (PMI, 2014). In addition, the EPMO should provide a clear and open communications system throughout its PMOs (Metuge, 2014; Patel *et al*., 2012; Rathore 2010) in order to foster open communication and collaborative engagements between the PMOs (John, 2016).

5.7 Establishment of an EPMO

Numerous researchers have suggested that the EPMO delivers enterprise-wide assistance with governance, mentorship, best practice methods, tools, consistent processes and its centralised, strategic-level corporate function (Letavec, 2015; Yazhari, 2014). Recent studies have provided overwhelming support for this view (Richards and Jackson, 2019; Selepe, 2019; William, 2017). Although the EPMO has proved effective in delivering what is lacking in the traditional PMO and has assisted in aligning projects to organisational strategy, the mere establishment of an EPMO does not guarantee success. This study will focus on the exploring support for the establishment of EPMO, the presence of EPMO CSFs and the perceived benefits thereof.

5.7.1 Support for the Establishment of an EPMO

One of the Critical Success Factors (CSFs) of an EPMO is the top management’s support and the positioning of an Enterprise PMO within the organisation. Most study participants (7/10) supported the idea of an integrated PMO at the strategic level and that the PMO would be best situated in Pretoria at the DoD Headquarters. However, when participants were probed further it became evident that there seems to be a lack of understanding that an EPMO does not replace the PO. In addition, one participant stated that it is possible to establish an EPMO

provided that the PO of each Arm of Service remains responsible for managing its own projects.

Some participants (3/10) were of the view that the EPMO structure already exists within the DMD. One of these participants supported the EPMO's establishment and suggested that, to avoid duplication of effort, the DMD should lead the implementation since it manages all the DoD projects, and the necessary structure already exists and only needs to be modified to be fit for purpose. He further stipulated that currently this structure is not used correctly and, thus, does not achieve the desired results. There was one participant who believes that EPMO can never work in a military organisation.

> P7: "It is not a matter of we do not want to do that because we do not work with the Navy. No, you going to look at it in a reasonable manner like what is the most cost-effective and efficient place to keep them together."

> P10: "My experience on how we are currently structured between Defence and ARMSCOR is that there is a duplication of efforts, we are wasting unnecessary time and cost because ARMSCOR have its own internal processes and procedures that they apply and they are responsible to adhere to, and us within our division, within our Directorate also have our own process and procedures that we adhere to but we are overall responsible to comply to the acquisition policy so I believe if they change those structures I proposed, it can cut out a lot of red tape. We can streamline the process and we can in low level process and stuff put in place, we might save time, increase efficient and effectiveness and in that we are going to save money. We might increase effectiveness and efficient and by doing that we might save money."

> P9: "If you cut out the managerial link of each director and centralised it, is not impossible but it depends on how many projects is ran by that centralised body, I will say it's definitely possible."

> P2: "Since this structure is already in place, it should be modified to suit how the flow of information and coordination is not doing those things and in order to deliver efficiency and be more effective."

According to the DoD (2019) the DMD is responsible for providing deployable, reliable, and supportable product systems to the System Managers. Furthermore, it is responsible for providing guidance and coordination of all acquisition process and engagements between SANDF and ARMSCOR. Many of the participants have shown support for the establishment of EPMO at a strategic level. Some participants (3/10) perceive the DMD to be the same as the EPMO, however, this fact is not confirmed by the DAP 1000.

5.7.2 The Presence of EPMO Critical Success Factors

In order to determine the readiness level of the DoD to establish the Enterprise PMO, the presence of various CSFs was assessed. For the EPMO to be established successfully, there are key elements that require attention since their failure would directly impact the project's successful execution (Moreno-Monsalve, 2020). The available literature was critically reviewed to identify CSFs for the EPMO. Therefore, it is important to determine the presence of these EPMO CSFs within the DMD of the SA DoD.

Table 9 Evaluation of Critical Success Factors

The Factor	**Description of the CSF**	**Present/Absent of the CSF in the DoD**
Top Management support	The organisation's top management dedication, support and commitment is important for the EPMO to be implemented successfully.	It is unclear from the study findings if there is top management support for the Enterprise PMO establishment.
Positioning of the EPMO	The EPMO must be positioned at the strategic level within the DMD and established as a separate business function.	The findings are in favour of an Enterprise PMO to be established in the DMD at a strategic level and centralised location for the DoD.
Structure of the EPMO	It is vital to have an organisational structure through which all PMOs report directly or indirectly to the EPMO.	The PO of each Arm of Service reports to its own Service Directorate of Acquisition.
Clear communication and channels of reporting	The EPMO should provide a clear and open communication system throughout its PMOs.	There is no collaboration and cooperation between Arms of Service' PMOs at their operational levels. There is no platform for sharing resources.
Staff with the appropriate expertise	For the EPMO to be effective, its staff must have project management expertise and business acumen.	Project Officers are experts within their own systems but not in Project Management.
Organisational and cultural change	The establishment of the EPMO requires a change of the organisation's cultural practice and the adoption of	The current organisational culture does not foster

	cultural changes.	continuous development, skills transfer and certification.
EPMO's objective focus	The EPMO should focus on achieving results instead of on providing tasks, tools, templates or policies	DAP and Project Management is based on policy.
Standardisation of processes	The EPMO drives the consistent use of project management processes, work with the PMOs to facilitate and execute projects and ensure the flexible application of the project management framework.	DAP 1000 policy provides standardisation of processes and templates.
Continuous improvement	It encourages continuous improvement by using the best practises and lessons learnt, light and flexible processes	Project management methodology is based on policy and not on best practice. The project officers are not continuously trained
EPMO Charter	EPMO should establish a clear charter	Not addressed in the policy

From the assessment delineated in Table 3 above, it can be determined that some CSFs (4/10) are present in the DoD. The presence of all the CSFs is critical for the successful implementation and operation of the EPMO. Therefore, currently it seems that the DoD is not ready to establish the EPMO. Organisations that have advanced in line with current trends are more likely to implement the EPMO successfully than those that are less aware of modern developments and are still struggling to master the art of project management. These less advanced organisations are unlikely to function effectively within a centralised portfolio (Richards & Jackson, 2019).

5.7.3 Perceived Benefits

It is evident from the reviewed literature that there are some benefits arising from the implementation of an EPMO within an organisation. These benefits include overseeing multi-departmental or divisional PMOs as a governance group and unlocking the potential to deliver value, because of positional authority and enterprise-wide accountability (William, 2017). Due to its capacity to provide oversight and governance to enterprise-wide project management systems, the EPMO creates and sustains project and programme management tools aligned with best practice and PMI standards, policies, and procedures (Maryland, 2014).

The study's participants seem to lack a thorough understanding of the EPMO and the value delivered by the establishment of such a system. One participant, however, indicated that the EPMO will eliminate the duplicate of projects.

> P8: "Definitely, I think that was the original idea that you have a Defence Materiel which have all the difference arms of Service Project under one Chief. I think it's not used effectively in terms of people put there and how they manage this thing but yes DMD definitely learn things about their structure, maybe extend their structure one level lower but yes."

> P6: "I don't know. It also will cut out duplication. So, it is really good for duplication because you will not have four different areas that does their own thing. It could save on budget costs, maybe on office equipment and things like paper stationery, because if it is procured jointly, maybe we can get it cheaper buying bulk. So yes, there is a lot of positives to having a joint office, maybe not so much for Acquisition for the product itself to the user."

From the reviewed literature, it is evident that there are benefits that are associated with the establishment of an EPMO due to its capacity to provide oversight and governance to the enterprise-wide project management team as indicated by Maryland (2014).

5.8 SA military organisation readiness to implement Enterprise PMO

There are different three types of PMOs and these PMOs are defined by the structure, roles and functions they performed. The type of PMOs includes project/programme, departmental/unit and Enterprise-wide PMOs which are aligned with the organisation hierarchical levels of operational, tactical, and strategic levels (Ferreira, 2019; Monteiro et al., 2016; Crawford, 2010). It is ideal that the organisation PMO advance gradually from the lower-level project/programme PMO to the highest level of Enterprise PMO. This will allow for the existing resources, expertise, and facilities to be used as base or foundation to advance from one PMO type to the next (Crawford, 2010).

It evident from literature that traditional PMOs are faced with many challenges such as lack of coordination, poor integration of knowledge, process and capacity and Enterprise PMO can be a solution (Rathore, 2010; Okereke, 2020). However, for the establishment of an Enterprise PMO to be successful, an organisation should have well-established and functioning project/programme and departmental/unit PMOs so that it is a natural progression. It is clear

from the study findings that there are various challenges in the military organisation PMOs. One such challenge that the participants expressed is the lack of clarity of structure or the level or type of PMOs their organisation operates and the role and functions of the PMOs. Coupled with this is the administrative and support challenges, and apparent lack of consensus in respect of standard, methodologies and processes followed by the organisation which are fundamentals for a project/programme and departmental/unit PMOs to be considered effective. Therefore, it can be concluded that there are still challenges with the elementary roles and functions of lower level of PMOs. Consequently, when following the well-founded theory of developing PMOs from lower level to higher level, it can be concluded that the South African military organisation is not ready for the establishment of Enterprise PMO.

5.9 Conclusion

This chapter provided a record of the information obtained through interviews with the study's participants in the form of comments. The findings of the study were discussed in detail in conjunction with supporting literature in order to make deductions and draw conclusions based upon the interview data.

CHAPTER 6

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The aim of this study was to investigate the feasibility of establishing an EPMO in a military organisation. It is important to emphasise that the objective of the study was not to assess the capability of the Services PMOs' personnel but rather to determine the readiness of the SA military organisation to establish an EPMO. The study identified ten CSFs required to establish the EPMO. These CSFs include top management support, appropriate positioning of the EPMO, EPMO structure, clear communication and channels of reporting, staff with the appropriate expertise, organisational and cultural change, the EPMO's objective focus, standardisation of processes, continuous improvement, and the creation of an EPMO charter. The data from the study suggested that there is absence of some of the above CSFs needed to establish an EPMO. The problem, however, does not lie in the lack of policy, since the DoD has a long and detailed policy on defence acquisition, but rather because there is lack of professionalisation of project management as a vocation, the use of project management methodology based on best practice, organisational culture that fosters continuous development, skills transfer and certification and, finally, a lack of collaboration and sharing of project information amongst the Arms of Service' PMOs.

The findings of this study revealed that the SA military organisation is using project management in its acquisition process within its defence weapon system. The results, however, indicated that despite project management being used within the DoD, there are challenges facing the organisation. In order to provide an answer to the research question and achieve the research objectives, it is necessary to provide a brief overview of important research findings. It is clear from reviewed literature that the DAP is a complex technical system. Therefore, there are numerous challenges confronting military organisations globally. The military organisation under the study is no exception and this study revealed the following problems:

a. There is lack of continuous improvement within PMOs involving appointing staff who are experts in their field. The military organisation offers an internal six-week project managers

course as a prerequisite for an appointment within the PMO. However, the professional development of project managers is not a ‘once-off event’, but a continuous improvement process. This procedure requires the combination of technical, leadership and strategic business management skills as the core competence for professional project managers. In addition, a project manager should contribute to the transfer of knowledge and expertise and participate in training, continuous development and education, such as tertiary studies and Project Management Institution professional development courses. The DoD’s organisational culture does not seem to foster its personnels’ continuous development, skills transfer and certification. The lack of skilled project management staff is exacerbated by the low retention of skills created by the recall of project officers to their particular Arm of Service, as well as the high staff turnover due to resignation.

b. The acquisition process is very complicated and technical. Personnel who find the process less complex are generally more experienced and have had a longer exposure to it. The military organisation acquisition process is lengthy, and the projects seem to be taking longer than the recommended standard duration. The reasons for such delays were not probed sufficiently during this study for the researcher to produce findings. However, the study did identify that there is a difference between the process as stipulated by the DoD policy and practice as alluded to by the respondents regarding ROC approval at Joint Operations. In the DoD Policy, it is documented that the ROC is generated in the different Arms of Service and approved at CJ Ops through OSC, while from the interview data, however, only two participants acknowledged their awareness of this procedure. This finding is contrary to DAP 1000, which states that the Operational Staff Council confirms that the requirement is valid and in keeping with the DoD's strategic objective and prioritising projects. This approval is an important step in the acquisition process towards ensuring cohesion, integration and inter-operability of military capability. Therefore, the exclusion of this phase prevents the creation of these specific factors and prevents the elimination of duplication and deficiency of projects.

c. The collected data provides no clarity on the military organisation’s structure with regard to the level of PMOs within both the Arms of Service and the DMD. The PMOs are generally arranged to coincide with organisational hierarchy levels including strategic, tactical and operational levels. The PMOs levels include Project/programme Office, Departmental/Regional

PMO and EPMO. The level of the PMO also informs its primary functions. Therefore, with no evident providing clarity about the type of PMO, it is almost certain that the functions of the PMOs within the Arms of Service and DMD are rather vague. Furthermore, the military organisation has no clear project management methodology that provides a certain level of standardisation and consistency that is being utilised to improve the project process. The military organisation depends on DoD policy as the only means of ensuring standardisation and consistency across all its PMOs.

d. The EPMO is responsible for ensuring that the military organisation's resources are optimally utilised and shared amongst the PMOs, projects are prioritised according to their strategic importance and that communication and coordination occurs between the PMOs. The study findings, unfortunately, reveal that there is a lack of coordination, clear and open communication, and information sharing across the Arms of Service' PMOs. The coordination of defence projects is vital for the overall inter-operability of the DoD. Furthermore, the fact that there is no cohesion and integration between projects poses the risk of duplication and redundancy. Significant improvements are needed to ensure the effectiveness of the current PMOs, and it seems that the DoD's 'bottom-up' approach to its acquisition procedures needs to change to ensure cohesion, integration and inter-operability.

In order to achieve its objectives, this study was divided into six chapters. Chapter 1 provided the introduction, purpose of the study as well as necessary background information about SA's military organisation. It further discussed the problem statement, scope of the study, assumptions, the research question as well as the study objectives and delimitations. The need for the study is emphasised by the challenges currently facing the military organisation's PMOs that function in isolation and seem to apply the tenets of the DoD's policy document inconsistently and do not share project-related resources nor use project management best practices. Furthermore, these PMOs have no formal communication protocol when initiating or undertaking projects. As such, the DAS and armaments face the risk of not being compatible with the other existing systems within the various Arms of Service.

Chapter 2 was dedicated to a review of the existing literature relating to the DAP and project management. The analysis of international perspectives and procedures was undertaken using

examples from the USA, UK and Australian DoD acquisition systems. This practice provided an international perspective so that comparison could be made with SA's military organisation's processes. Once the comparison had been made, and lessons for the military organisation established, this chapter moved on to focus on project management issues. The reviewed literature relating to project management covers the types of PMOs, challenges, EPMO, CSFs, and the benefits of implementing the EPMO.

Chapter 3 detailed the research design and methodology. The study used the qualitative research methodology which provides for an extensive and detailed descriptive narrative of the phenomenon under study. Ten participants were selected through purposive sampling from SA DoD's PMOs. The research adopted the semi-structured interview as an instrument for collecting the required data. The issues of validity and reliability, as well as relevant ethical considerations, were addressed. The study used the Nvivo computer program to analyse the collected data.

Chapter 4 discussed the participants' information; the themes derived from the collected data using the Nvivo program and the study findings. The study identified six themes and each theme was explained in detail.

Chapter 5 provided detailed analysis and discussion of the findings using the participants comments and literature to draw deductions and conclusions. The study findings were clarified in relation to the results delineated in the reviewed literature.

Chapter 6. In the current chapter, the study's conclusion and recommendations are elucidated and the limitations and possible future studies presented.

6.2 Recommendation

In view of this study, the following recommendations on the discussed themes are provided for the benefit of the SA military organisation:

6.2.1 Career Management: The SA military organisation should define the project managers career path with reference to educational and experiential requirements. Once PMOs' staff are suitably qualified, the organisation should provide them with official certification to encourage

their continuous learning and engagement in project management related matters. When appointing officials in the project management environment, the requisite operational knowledge and technology involved within the project should be considered, together with the knowledge and exposure to the project management field. The organisation should formalise the 'on-the-job' training, knowledge sharing, and certification required by PO managers.

6.2.2 Origin of the capability requirement: The 'top-down' approach to the generation of capability requirements is a more effective method in terms of inter-operability and avoiding duplication of effort, than when knowledge and experienced is developed from within the Arms of Service. Therefore, it is recommended that the military organisation adopt a 'top-down' approach.

6.2.3 Cohesion of effort: Having different systems involved in the acquisition projects poses a risk of duplicating practices through a lack of system integration. The joint capability needs to address the current gaps in this process, and opportunities should be identified and formulated into systems that will ensure that the cohesion of requirements will be aligned with strategic direction from the organisation's strategy and force design. The various Arms of Service should then be tasked to develop the joint capability needs to solve the challenges in relation to the capability requirements and available options. The single forum that is involved in the force design should formulate joint capability needs, prioritise the capability and approve projects before their endorsement by politicians/Defence Minister. It is further recommended that a small designated joint projects team with relevant experience and qualifications be appointed in a full-time capacity to serve the chairperson and members of the forum responsible for the functions mentioned above.

6.2.4 Project Management Methodology: Although the defence policy provides for a standardised acquisition process and procedure, there are best practice project management methodologies upon which the PMOs within the global defence forces are based, such as PMBOK. It is recommended, therefore, that the organisation adopts the PMBOK or any other suitable and well-understood methodology for use within the SA Arms of Service.

6.2.5 Sharing of Information: It is recommended that the DMD should utilise the newly developed intranet as a platform to share project management best practices, resources and lessons learned across all Arms of Service' PMOs and Directorates. PMOs in the different Arms of Service should be able to access information across the PMOs. The military organisation should move away from working in 'silos' in terms of project management and foster coordination and cohesion amongst the different Arms of Service.

6.3 Limitation of Research

This research study was conducted within the SA military organisation during the Covid 19 pandemic − a situation that presented unique challenges. The researcher had to ensure that everyone involved in the interviews observed the Covid 19 protocols as prescribed by government regulations. Due to the secrecy and confidentiality of military projects, the participants could not provide specific project data and documentation. Some information which would have been helpful to the study could not be disclosed nor is it available in the public domain.

6.4 Further Studies

Given the above considerations, the researcher believes that a significant opportunity exists for conducting a further study, using a centralised requirement capability management and a 'top-down' requirement generation from a centralised body rather than the 'bottom-up' Arms of Service' requirement generation. Although DAP improvement is beyond this study's scope, another opportunity exists for studying the possibility of adopting a leaner process, similar to that of the Australian DAP, with fewer approval gates before the Acquisition Phase of the life-cycle. Furthermore, a research project seeking to determine the cause of delay or prolonged duration of projects within the military organisation would be a valuable exercise.

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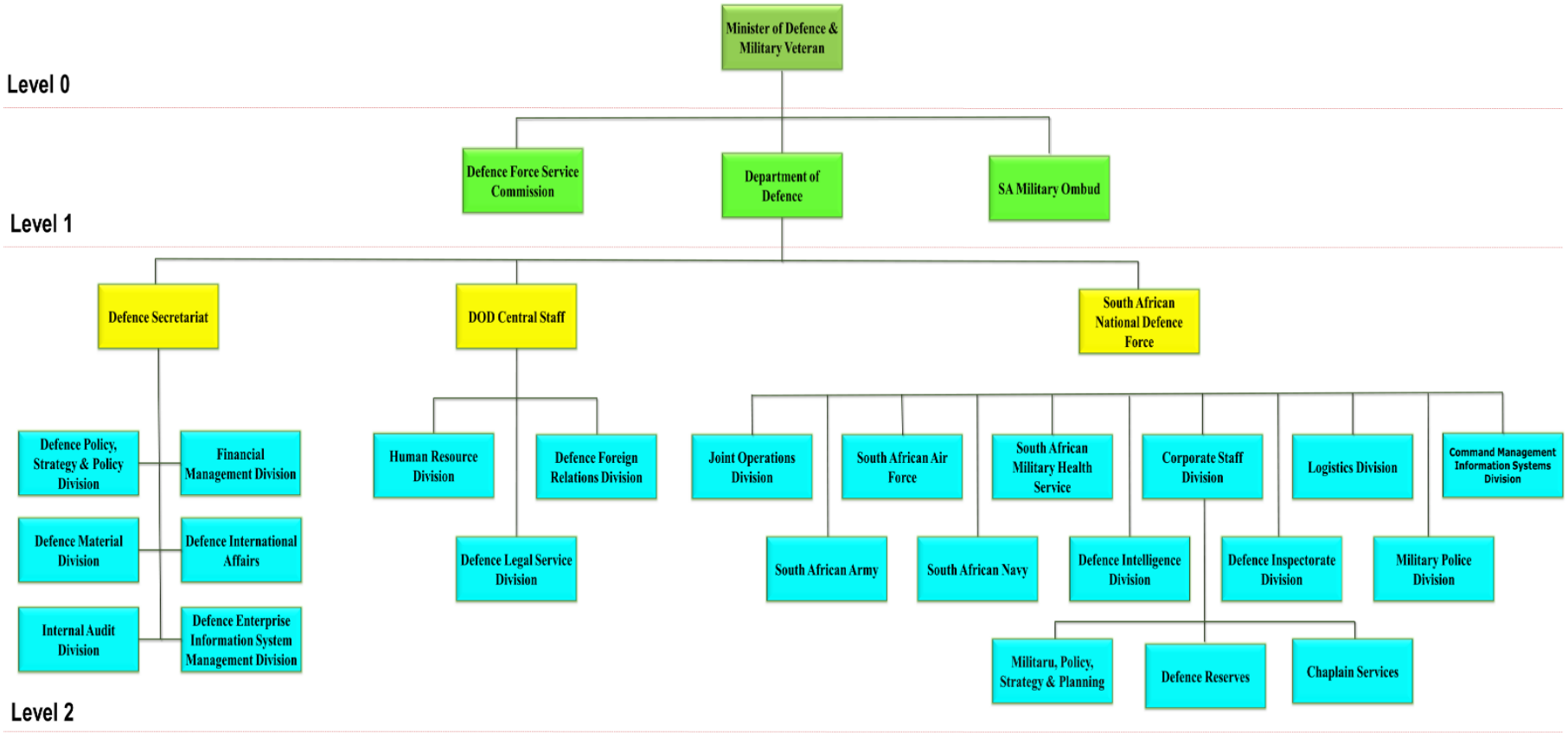
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APPENDIX

A Department of Defence Structure



C Semi Structured Interview Questions

Investigate the Feasibility of establishing an Enterprise Project Management in a military organisation

My name is Mulalo Vivian Mnisi and I am a master's student in Industrial Engineering at the University of the Witwatersrand, Johannesburg. As part of my studies, I have to undertake a research project, and I am investigating the feasibility and benefits of an Enterprise-PMO in a military organisation under the supervision of Dr Mncedisi Dewa.

The aim of this research project is to answer the research question: What is the feasibility and benefit of establishing an Enterprise-PMO in a military organisation to aid acquisition management in projects delivery? As part of this project, I would like to invite you to take part in an interview. This activity will involve one on one interview and will take around 40 minutes. With your permission, I would also like to record the interview using a digital device (optional).

There will be no personal costs to you if you participate in this project, you will not receive any direct benefits from participation but there are no disadvantages or penalties if you do not choose to participate or if you withdraw from the study. You may withdraw at any time or not answer any question if you do not want to. The interview will be completely confidential and anonymous as I will not be asking for your name or any identifying information, and the information you give to me will be held securely and not disclosed to anyone else. I will be using a pseudonym (false name) to represent your participation in my final research report. If you experience any distress or discomfort at any point in this process, we will stop the interview or resume another time. If you have any questions during or afterwards about this research, feel free to contact me on the details listed below.

This study will be written up as a research report which will be available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you (optional). The data collected from this research project will be stored in password protected computer and will be kept for 5 years. With your permission the data collected from this research project may be used by other researchers (optional). If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the

University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408 or email hrecnon-medical@wits.ac.za.

Any questions before we begin? Did you sign the Informed Consent to participate in this study?

Do I have your permission to begin recording our discussion?

Theme 1

Background and Qualifications

Q1 What is your background and role in Defence Acquisition Management Process?

Q2. What academic and Project Management training do you have?

Q3. Please explain to me how Project Manager/ Project Officer are trained, developed, and mentored?

Q4. What are the qualifications, skills and expertise do your organisation have in terms of Project Management?

Theme 2

Roles and Responsibility

Q5. Are the roles that Acquisition Management Directorate, Project Manager, Project Office in the acquisition process clearly defined?

Q6. Whose responsibility is it to ensure that there is jointness and no duplication of efforts in the arms of services and division? How do they ensure such jointness?

Theme 3

Department of Defence Acquisition process

Q7. Do you know the acquisition process from beginning to end?

Q8. Can you briefly take me through an Acquisition Process?

Probe: in your opinion, is the process easily understandable?

Q9. In the acquisition process, who is responsible for stipulating the Requirement Operational Capability?

Q10. What are the ROCs based on? Does the DoD have strategy that is linked to Government priorities and are projects linked to the DoD strategic plans?

Theme 4

Project Management Office

Q11. Do you have a project management office?

Q12 What is its structure of the PMO?

Probe: Strategic, tactical, or operational?

Q13 What is the PMO role in acquisition process?

Q14. What are the major tasks that a project officer/project Manager plans in acquisition Process?

Q15. What project management methodology is adopted in your PMO?

Q16. What are challenges experienced in your PMO?

Theme 5

Readiness to Establish Enterprise PMO

Q17. Do you think all the Arms of Service PMO use the standardised processes and procedures?

Q18. Do you have a system/platform do you use to share Project Management knowledge, lesson learnt and tools (resources)?

Probe: Do you have an intranet, PM software?

Q19. Is the flow of information and resource across the Services PMO coordinated? Do these PMOs work in a coordinated manner to ensure the jointness of SANDF?

Q20. How are the projects in Defence Materiel made visible and priorities across all Arms of Service? Is there collaboration between PMOs across the services?

Q21.What do you think about the establishment of an integrated PMO at the strategic level, where all Arms of Service work together jointly? Where do you think this PMO would be best located?

Q22. Do you think Defence Materiel Division can benefit from a centralised PMO at the strategic level?

D Data Analysis Emerging theme

Codes

Name	Description	Files	References
Background	Background of participants	6	12
experience in Project		5	10
Career Management	Level of training, Mentorship and Couching	0	0
Employee Retention and Staff Turnover		4	5
Level of Training		8	34
Duration of course		3	4
Opportunity to study further		6	8
Prerequisite for Project Officer		10	20
Tertiary Qualification		7	8
Mentorship & Couching		8	27
Defence Acquisition Process		6	10
complexity of process		9	16
DAP 1000 Handdbook		4	9
Duration of Acquisition Projects		3	6
Management of		5	6

Name	Description	Files	References
process			
Process Approvals		4	8
ROC		9	17
Enterprise Wide Resource Utilisation	Flow of Information, sharing of knowledge and duplication of effort	0	0
Isolation		10	36
software tool		7	12
Establishment of EPMO		0	0
Perceive Benefits		5	8
Support for the EPMO		9	24
PMO Function		9	22
allocation of funds		5	9
AMSCOR responsibility		5	8
Escalation of costs		1	1
Functioning of Structure		1	1
PMO Challenges		2	2
PO Priorities		1	1
Prioritisation		4	5
SANDF responsibility		5	9
Standardisation of process		9	12
PMO structure		6	15

Name	Description	Files	References
DMD Structure		3	6
Integrated Project Team		5	5
Support Staff		7	10
PMO Support		1	1
Project Commonality		1	1
Project Management Competence		6	11
Body fof Knowledge		3	4
continuous improvement		2	2
project management knowledge		2	2
sharing of knowledge		2	6
Project management methodology		7	9

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