INVESTIGATING THE USE OF THE ITIL FRAMEWORK TOWARDS IT SERVICE DELIVERY AT THE NMMU

By

Nontobeko Lubambo

Submitted in partial fulfilment of the requirements for the degree

Magister Technologiae

In

Business Information Systems

In the

Faculty of Engineering, the Built Environment and Information Technology

Of the

NELSON MANDELA METROPOLITAN UNIVERSITY

Supervisor: Mrs. Alison Moller

Co-Supervisor: Ms. Darelle Van Greunen

January 2009
DECLARATION

“I, Nontobeko Audrey Lubambo hereby declare that:

- The work in this paper is my own work;
- All sources used or referred to have been documented and recognized by means of complete references; and
- This dissertation has not been previously submitted in full or partial fulfilment of the requirements for any equivalent or higher qualification at any other educational institution.”

Nontobeko A. Lubambo

January 2009
ACKNOWLEDGEMENTS

The successful completion of this study would have been impossible without the support, advice and assistance and encouragement of the following persons. I wish to record my sincerest thanks and appreciation to the following:

- To Mrs. Alison Moller, my supervisor for her encouragement, direction and mentorship during the completion of this research paper;
- To Ms. Darelle van Greunen, my co-supervisor for her professional and constructive guidance during the completion of this research paper;
- To Mr. Stephen Viljoen, Operations Manager of the ICT Services at NMMU for his support and inspiration in my studies and for giving me the time to finish the study;
- To God for his everlasting love, without his guidance I would not have been able to even attempt this work;
- To my family for their unconditional love and support.
ABSTRACT

The purpose of this research was to investigate what is involved in IT Service Management and how the NMMU can implement it to improve the quality of IT service support and service delivery. The IT Service Management approach was investigated but the main focus was on the Service Support and Service Delivery in the ITIL framework.

Higher Education was analyzed to try and measure the maturity level of the ITIL process implementation to see where Higher Education in South Africa is and to determine the gaps.

Findings from the empirical study will be presented and recommendations highlighted to Top management and the IT department in order to promote and improve the quality of the IT service being delivered to users and customers.

The data was collected and administered by means of a structured questionnaire based on the ITIL Service Capacity Maturity Model and Rick Leopoldi’s alternative Maturity Assessment method. An Association of South African University Directors of Information Technology (ASAUDIT) questionnaire on Service Management was also used to supplement the questionnaire.

It was discovered that the implementation of ITIL in most organizations brought about improvements and benefits in the quality of the IT service being delivered.
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List of Abbreviations

ASAUDIT Association of South African University Directors of Information Technology
BI Business Intelligence
BSI British Standards Institutes
CAB Change Advisory Board
CCTA Central Computer and Telecommunications Agency
CCMI Capability Maturity Model Integration
CMDB Configuration Management Database
COBIT Control Objectives for Information and related Technology
DHL Definitive Hardware Library
DSL Definitive Software Library
EXIN Exameninstituut voor Informatica
HE Higher Education
HPDC Hewlett-Packard Development Company
ICT Information and Communication Technologies
IT Information Technology
ITIL IT Infrastructure Library
ITSCMM IT Service Capability Maturity Model
ITSM IT Service Management
MOF Microsoft Operations Framework
NMMU Nelson Mandela Metropolitan University
OGC Office of Government and Commerce
OLA Operational Level Agreement
RFC Request for Change
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<tr>
<td>ROI</td>
<td>Return on Investment</td>
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<tr>
<td>SANREN</td>
<td>South African National Research Network</td>
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<td>SIP</td>
<td>Service Improvement Plan</td>
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<td>Service Level Agreements</td>
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<td>SLM</td>
<td>Service Level Management</td>
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<td>WOA</td>
<td>Web Oriented Architecture</td>
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Chapter 1

Introduction

1.1 Background

Information Technology (IT) has become a vital asset in any business; it is part of one of the long-term business investments that organizations depend on and plays an essential role in building an infrastructure that enables important business improvements (Renkema, 1999, p. 3). As a result of the rapid changes in the IT industry, many organizations find themselves trapped in this situation of having to adapt or suffer in terms of performance and profit. It is therefore necessary that they manage their IT processes with efficient, secure and reliable solutions that will deliver IT services that further the organization’s business goals (Simcox, Shah, Dunton, & Groves, 2005, p. 1).

It is this perceived lack of a complete management strategy that has prompted the study of IT Service Management, in particular the implementation of the IT Infrastructure Library (ITIL) framework in an organization in order to improve the quality of IT service delivery.

Nelson Mandela Metropolitan University (NMMU) which came into effect in January 2005 is the result of a merger of the PE Technikon, the University of Port Elizabeth and the Port Elizabeth campus of Vista University. This union of three very different institutions came about as a result of government’s countrywide restructuring of higher education – intended to deliver a more equitable and efficient system to meet the needs of South Africa in the 21st century. Seeing that each institution had its own IT and business strategies, the need for a consolidated management strategy has been identified. Having an IT Service Management (ITSM) framework implemented will ensure that the university meets its business objectives. Therefore the NMMU will be used in this case study to investigate the workings of ITSM, specifically the implementation of the ITIL framework.
Office of Government and Commerce (OGC) (2002) defines ITSM as a discipline for managing large-scale Information Technology (IT) systems to meet the Customers' requirements. It has its roots in the late 1970s in British central government, who saw the need to maintain control over IT support structures to achieve efficiency.

ITIL was established as a new approach to IT Service Management with the purpose of ensuring better use of IT services and resources. It is a series of documents that are used to assist in the implementation of the framework for IT Service Management. ITIL is a seven-volume catalogue of best IT practices. It covers major aspects of IT operations, including service support, delivery and management; security, infrastructure and application management; and business alignment. The latest development in IT Service Management has been the release of British Standards Institution’s Standard for IT Service Management (BS15000) in 2002 that supports the best-practice processes promoted in ITIL (Sallé, 2004, p. 10).

In order to be ITIL certified, the IT personnel need to complete training in one of the following levels and the certification is individual rather than organizational:

- ITIL Foundation Certificate Training (Entry Level)
- Practitioner (Intermediate) and

Through Tenet (the NMMU’s Internet Service Provider) has also started an initiative to give ITIL certified training to staff members from IT departments in Tertiary Institutions throughout South Africa.

This study will focus on what is involved in IT Service Management and how can the NMMU implement it to improve the quality of IT service support and service delivery.

The study should give insights into the workings of ITSM in particular, the ITIL service management approach, a framework that is rapidly gaining popularity all over the world. It is necessary to first define the concept of IT Service Management so as to gain a broad understanding of the topic.
1.2 Description of Problem Area

Many organizations have their own ICT service departments which they depend on for most of their business operations. But if the department is not running smoothly, it runs a risk of losing credibility with Management. In order for service levels to improve, the ICT Services department needs to reengineer the way service management is implemented.

The NMMU is facing major competition from other universities in South Africa, who offer better-quality facilities and IT services to their customers. Having an IT Service Management framework implemented is vital. It will provide the best practice tools and techniques for mapping IT processes which are aligned with business objectives, thereby improving the quality of service.

Not only must IT managers find innovative ways to deliver high-quality services but they must do so at a time when IT budgets are under pressure. The NMMU faces the challenge of meeting its objectives while receiving less funding from the Department of Education and reduced income generated from student fees. In order to enable the university to compete more effectively, the business IT structure, including infrastructure, processes and people need to work as a single, highly functioning unit (Bergum, Chapman, Dyer, Gicewicz, & Ptaszynski, 2005, p. 1).

ITIL implementation has received a huge following since its inception in the UK. Many organizations are seeing the benefits they can reap from it. ITIL should play a role in the university’s business strategy. According to OGC (2002, p.10) some of the benefits that the university will see are:

- Improved IT services through the use of proven best practice processes.
- Improved customer satisfaction through a more professional approach to service delivery.
- Reduced costs.
- Standards and guidance.
- Improved use of skills and experience.
Improved delivery of third party services through the specification of ITIL.

The main focus of the study is on service support and delivery and a clear understanding of the organization and its operations is critical to the success of the ITSM implementation. Many organizations are not yet aware of the full benefits that an ITIL best practice framework can deliver.

1.3 Problem Statement

The aim of the research is to investigate what is involved in IT Service Management and how can the NMMU implement it to improve the quality of IT service support and service delivery. There are many best practice frameworks and standards that can help IT staff get started at shaping the IT operations and building better processes. However ITIL was found to be the most suitable because of its effective way in managing the relationships between business processes. ITIL provides best practices, which an organization can adopt or adapt to fit their specific needs.

The NMMU currently has the basic ITIL recommendations in place but it is not structured.

In order to address this, the following questions have been investigated:

- What is involved in IT Service Management?
- What is the situation of ITSM in Higher Education (HE) in South Africa?
- What are the recommendations for an effective framework solution?

1.3.1 Objective

The objective of this study is to recommend a comprehensive framework solution that the NMMU can implement to improve the quality of IT service delivery and support.
The thesis will therefore, use the ITIL framework to recommend a solution for higher education. The solution will be as generic as possible so that it can be applied to any higher education institution. The thesis is not meant to be a total solution for implementing ITIL. It merely proposes a comprehensive solution which may be used to assist with the ITIL process.

1.4 Research Methodology

The following section gives an overview of the methodology that was used in the study. The following procedures were adopted to solve the main problem and sub-problems:

1.4.1 Literature Review

An in-depth literature study was undertaken on the concept of IT Service Management and the approaches which are adopted by organizations. The information was analyzed to determine which solution best suits the NMMU. Literature from the NMMU and other tertiary institutions Libraries in South Africa was consulted to determine the feasibility of the study. Internet searches were also used to find relevant information.

1.4.2 Questionnaire

A Questionnaire was administered to gauge the ITIL maturity level of the higher education institutions around South Africa. An ASAUDIT questionnaire on Service Management was also used to supplement the questionnaire.

1.4.3 Interview

The study also consisted of a personal interview with an ICT System Engineer at the NMMU in order to give more insight into what NMMU is doing with the current technological trends in the IT environment.

In order to ensure that the ITSM Framework is aligned with the new NMMU business strategy; both the external environment in which the NMMU does business as well as the current internal environment were analyzed.
1.5 List of Chapters

Chapter 1 Introduction
This chapter gives a brief description of the history of IT Service Management, what it is, and the structure of it, where is it used, how it works and why it has been chosen for the study. The chapter also discusses the main and sub problems to be addressed.

Chapter 2 Definitions of concepts of ITSM
This chapter is a review of literature with regards to IT Service Management, the ITIL framework and the structure of the framework and the concepts related to the implementation of the key principles of ITIL.

Chapter 3 ITSM approaches focusing on the ITIL Framework
In this chapter, the ITSM approaches will be examined. The focus is on service support and delivery within the ITIL framework.

Chapter 4 Analysis of ITSM in Higher Education
This chapter serves as the backbone of the theory required to identify the current state of ITSM/ITIL implementation in Higher Education in South Africa. The knowledge gained here will be used to identify the gap between where higher education is presently positioned and where it should be compared to the ITIL processes.

Chapter 5 Research Design and Methodology
This chapter details the research methodology and the techniques used for data collection used in this study as well as the justification for the methods used.

Chapter 6 Recommendations and Concluding Remarks
The results of this research study done in the preceding chapters will be presented and analyzed in this chapter, which will allow the researcher to make some recommendations for the NMMU and some concluding remarks.

Figure 1.1 below is the graphical representation of the chapters.
Figure 1.1 The Graphical Representation of the Chapters
Chapter 2
Definition of concepts in ITSM

2.1 Introduction

This chapter is a review of literature with regards to IT Service Management, the ITIL framework - the structure of the framework and the concepts related to the implementation of ITIL.

IT Service Management is the main focus of the study. The chapter provides insights into the workings of ITSM in particular, the ITIL service management methodology, a framework that is rapidly gaining popularity all over the world.

2.2 The Service Industry

The service industry has changed over the years and the service organization is very different from a manufacturing organization but the basic core is the same. Organizations cannot develop a sustainable business by offering a product or service only but need a combination of both and the customer is at the heart of this process (Grönroos, 2007, p. vii). A service organization that wishes to stay on top of its game has to make sure it provides the best service quality it can to its customers. Customers are in search of a total service offering that can be used to create value.

2.2.1 The Service Strategy

An organization can differentiate itself in terms of: Core product (Quality), Price, Image and Service strategies as the main source of competitive advantage. Grönroos (2007) argues that the organization can only differentiate on one of these strategies but that does not mean that the other strategies are any less important. In order to remain competitive, they need to focus on one only.

The environment in which any organization functions, determines the strategies that it will employ to survive in that rapidly changing environment. The organization must
consider both the current and future situation. Ward and Peppard (2002) have proposed some success factors to consider when formulating a service strategy; namely:

(1) Service Delivery (what value can be added),

(2) Understanding customer needs in order to grow the business,

(3) Business-driven innovation, using IT as enabler.

Management faces challenges of coordinating services due to trends in the service industries as well as customers’ demand for high quality of services. It is therefore important for organizations to have a broader knowledge of service management (Rootman, 2006, p. 28). For the purpose of this study, IT Service Management will be discussed. The whole chain of activities has to be coordinated and managed as a total process. That is where IT Service Management plays a role, as a total solution for the integration of these processes, activities, services, people and technology.

There are organizations world-wide that have taken it upon themselves to help businesses come up with appropriate IT service strategies that address issues in the development and delivery of IT services. One such organization is the OGC in the United Kingdom which has developed the ITIL framework for IT Service Management.

The next section of this chapter focuses on IT Service Management.

2.3 Definition of ITSM

Various definitions of ITSM are proposed in the literature. OGC (2002) defines IT Service Management as a discipline for managing large-scale Information Technology systems to meet the customer’s requirements. It has its roots in the late 1970s in British central government, who saw the need to maintain control over IT support structures to achieve efficiency.

Viljoen (2005) defines IT Service Management as: “The concept of applying a structured set of processes to ensure the quality of mission-critical IT services to meet levels of service agreed to with the customer.”
Hewlett-Packard Development Company (HPDC, 2006) defines IT Service Management as a delivery and support of IT services to meet the business needs of an organization. The key to this definition is the concept of alignment of the IT processes with the business strategy also referred to as Strategic Alignment. It is all about efficient and effective use of people, processes, products and partners.

Today, several standards and a collection of best practices are available that prescribe how to manage specific aspects of the IT function in an organization (ITGI, 2007, p. 8). Over the past 20 years ITSM has evolved beyond measure, organizations started with implementing help desk solutions, then moved to service delivery focusing on call logging and support, and then to ITSM focusing on application asset and Service Level Management. It is a comprehensive solution that organizations can manage and maintain effectively (IT Business Edge, 2006).

A clear understanding of the organization and its operations is critical to the success of the ITSM implementation. Many organizations are not yet aware of the full benefits that an ITIL best practice framework can deliver.

This statement above is supported by Foster and Melliar’s (2004, p. 8) analogy which relates IT Service Management to one of building a house. One starts with a vision of how they would like the house to look; the next step is to carefully formulate plans to achieve the vision and then implement from the ground up (i.e. the foundations). Lay poor foundations and the house will begin to crack and require repeated expensive attention and in some instances it could come crashing down. The same applies within IT departments. The focus is on the various stages of building the house on time, are we managing our costs? are the builders motivated, measured and rewarded accordingly and most importantly, are the builders aware of the vision? Are we building in accordance to the approved plans, standards and regulations or are we cutting corners to save money? These are all questions asked within IT departments on a regular basis.

The key objectives of ITSM include alignment of IT services with the current and future needs of the business and improvement of the quality of IT services delivered to the
customer. The use of processes is the key to achieving this goal toward the provision of appropriate, value for money services. In order to achieve this, the correct processes need to be developed and implemented (Axios Systems Consulting, 2007).

The adoption of IT Service Management disciplines and processes will assist with the continuous improvement in the quality of IT services. This need for the integration of people, processes, products and services is a major headache for many organizations but is needed in order to maintain a good quality of IT services.

The justification for the implementation of a service management strategy comes as a result of growing trends in business and because of external factors. There are persistent driving forces of change which affect organizations and they are forced to adapt new strategies in order to stay competitive. Anderson and Anderson (2001, p. 5) suggest the following driving forces of change:

- **External forces** - which are concerned with the environmental influences on a business, these include: political, economic, social, technological and legal forces;
- **Market requirements for success** - Understanding customer needs in order to grow the business, these include: speed of service delivery, quality levels, innovation initiatives, and the level of customer service;
- **Business imperatives** - it is critical to identify those areas of the organization that offer the biggest potential for competitive advantage and focus initial efforts there; these include changes in the mission, vision, strategic goals, and services of the organization;
- **Leader and employee behaviour** - changing paradigms within the organization.

These driving forces may arise from the need to deliver increased value for money, which would lead organizations to look at the external environment in which they operate to identify those areas that offer the biggest potential for competitive advantage.

As IT costs continue to rise daily, it is essential that IT service departments react positively to the changing markets and focus on maintaining an IT infrastructure and
support service. It is becoming vital for IT service departments to apply a more cost effective and efficient service (Moller, 2004, p. 1).

The diagram below depicts the ideal IT Service Management framework for an organization, based on the ITIL Framework which will be discussed in the next section.

![IT Service Management Framework](image)

**Figure 2.1** The IT Service Management Framework (OGC, 2002, p. 4)

Literature reflects that the standards and best practice approaches available are independent of the type of organization and would as such achieve the same objective irrespective of the nature or type of organization that adopts them. A more detailed discussion of the individual components of the framework follows in chapter 3.
2.4 What is ITIL?

2.4.1 Definition of ITIL Framework

As described by Côté, Grondin and Byam, A framework defines or outlines the entire area; it effectively displays the overall picture. It is a checklist, an organizing principle and a communications tool for managers, policy-makers, planners and staff so that their job is made easier (Côté, Grondin, & Byam, 2002, p. 12).

OGC (2002) defines ITIL as the most widely accepted approach to IT Service Management in the world. ITIL provides a cohesive set of best practice, drawn from the public and private sectors internationally. Although the UK Government created the ITIL guide, it is rapidly being adopted throughout the world as the standard for best practice in the provision of IT Service by both public and private sector organizations alike.

ITIL was developed in the 1980s by the Central Computer and Telecommunications Agency (CCTA) as a set of comprehensive best practice in achieving the efficient support and delivery of high quality IT services. The CCTA was later renamed to OGC. This body is independent of any trade interests which is where its strength lies. (HPDC, 2006, p. 9).

According to Rudd and Hodgkiss (2004) one of the core principles of ITIL and IT Service Management is the provision of quality Customer service. This is achieved by ensuring that Customer requirements and expectations are met at all times. The satisfaction of business and Customer requirements is fundamental to the whole of ITIL.

2.4.2 ITIL Processes and Procedures

The main focus of ITIL has been on service management, which is separated into two main areas, Service Support and Service Delivery as seen in the diagram in Figure 2.1. The services are dependent on a well managed infrastructure to deliver business value. The ITIL framework consists of many components, one of them is service management mentioned above. The other components are, Business perspective, ICT Infrastructure Management, Application Management, Security Management, Planning to Implement, Software Asset Management and Small Scale Implementation.
For the purpose of this study, the emphasis is on Service Support and Service Delivery as described in ITIL version 2. The Service Management disciplines at the center of the IT Infrastructure Library are categorized into two distinct groups:

Service Support

This group focuses on the day-to-day operation and support of IT services (OGC, 2000).

- The Service Desk function is the face of IT to its users and therefore of vital importance in any organization. Service Desk staff log, resolve or escalate and close all incidents. They also increasingly provide more high-level first line support as well as initiatives for service improvement and cost reduction.
- Incident Management process records, classifies, tracks and closes all incidents in a controlled and consistent manner. This allows operational service levels to be restored as quickly as possible and helps reduce the number of new incidents.
- Problem Management has a key role in IT Service Management and deals with the identification, investigation and classification of problems. It pro-actively reduces incident volumes and continually improves the underlying IT infrastructure.
- Asset and Configuration Management provides the crucial foundation for Incident, Problem and Change Management. It records, audits and tracks all configuration items in the IT infrastructure and their relationships from purchase to obsolescence.
- Change Management provides a consistent approach to evaluating and implementing any change to the IT infrastructure. It allows for the assessment of the impact, risk and resource requirements associated with proposed changes.
- Release Management offers a systematic framework for large or critical hardware rollouts, major software rollouts or bundled sets of changes. It takes into account all technical and non-technical aspects of a release from initial
release policy and planning through to development, testing and controlled implementation.

**Service Delivery**

These processes consider the long-term planning and improvement of IT service provision (OGC, 2001).

- **Service Level Management** aims to ensure a satisfactory quality of IT service provision by setting realistic and agreed targets between provider and customer. A process of monitoring, reporting and reviewing of actual service levels highlights any problem areas and facilitates continuous service improvement.

- **Financial Management of IT Services** provides essential management information on IT asset and service costs. Through a process of budgeting and accounting true costs are revealed and the value of IT to the business can be demonstrated.

- **Capacity Management** aims at aligning IT service level provision to the current and future business needs. It is concerned with optimizing the usage of existing IT resources as well as ensuring new resources are made available in a timely and efficient manner.

- **Availability Management** ensures that all IT systems and services are functioning as required and that availability is sustained in a reliable and cost-effective way. With the supply and provision of information companies need to consider security management as well to prevent unauthorized use of information.

- **IT Service Continuity Management** ensures that major failures of technical equipment or facilities associated with IT Service provision are managed efficiently and service levels are restored back to an acceptable level within agreed timescales.
2.4.3 ITIL Skill Requirements

This section describes the skills required in the IT Service Management field and also the entire IT discipline.

Rudd - former president of the Institute of Service Management explains why training and education in IT needs a total makeover; he states that, “The emphasis within IT units is moving away from looking purely at the technology aspects of IT and focusing more on the management, business, customer and service aspects of IT service provision. The future of service management relies on the development of more rounded IT professionals with a broad range of technology-based skills, very much aligned to the changes being sought by businesses as a whole,” (Service Talk, 2006).

One of the most important policies that managers of any organization must establish is the recruitment of qualified personnel. In view of the critical role the human factor plays in IT, management should strive to get the best people for every job function in the department. Recruiting the best professionals is not a minor job. It becomes particularly challenging in periods of strong competition between organizations for talented and/or experienced people in a given professional field. Because the most critical capability in IT industries is knowledge, and because knowledge resides in people, managers cannot expect to achieve a long-term competitive advantage if they compromise the quality of people recruited (Levy, 1998, p. 27).

Paul Goncalves (personal communication), Service Manager at Cadbury South Africa (Pty) Ltd in Port Elizabeth mentioned in a talk he presented to the NMMU’s ICT Services Department, that in order to have a seamless implementation of ITIL Service Management, the organization needs to invest a lot in its staff. Finding the right people at the Service Desk is the first thing a business needs to do.

The OGC has appointed EXIN, the Dutch foundation ‘Exameninstituut voor Informatica’ (EXIN) to provide accreditation for ITIL training worldwide to safeguard and guarantee the quality of IT Service Management training. EXIN International, the leading international certification organization for ITIL training is an independent organization, its goal is to promote the quality of the ICT sector and ICT professionals working in the
field, has administered approximately 170,000 training certificates to individuals (OGC, 2006). Accredited training providers offer potential candidates the best preparation for their EXIN exam.

ITIL is supported by a comprehensive qualification scheme, accredited training organizations, and implementation and assessment tools. In order to be ITIL certified, an organization’s ICT staff needs to complete the training. The certification is individual rather than organizational and comes in the following levels as described by the Axio Systems Company:

2.4.3.1 ITIL Foundation Training

The Foundation Certificate in IT Service Management guarantees your understanding of the basic terms, concepts of ITIL, and relationships between the ITIL processes. This training course introduces these concepts and terminology together with a view of where to begin through to continuous improvement of an organization.

2.4.3.2 ITIL Practitioner Training

This course is designed to specialize in any of the individual ITIL process disciplines which can be grouped and combined to provide practitioner relevant tools as per the customer’s organizational requirements.

2.4.3.3 ITIL Service Manager Training

This course delivers a more detailed and practical understanding of ITIL processes for IT Service Managers. This practice oriented course uses case studies and presentations to test and improve the participant’s essential skills in Service Management (Axios Systems Consulting, 2007).

2.4.4 Benefits and ROI of implementing ITIL process in an organization

The question being asked is ‘how can ITIL improve a company’s business performance?’ and the only way to answer that is to look at the benefits of implementing
any process improvement strategy and ITIL will definitely give the organization a Return on Investment (ROI) if it is done properly. Greiner (2007) states in her article featured in the CIO Magazine that: “A well-run IT department that manages risk and keeps the infrastructure humming not only saves money, but it also allows the business people to do their jobs more effectively.”

ITIL provides a systematic and professional approach to the management of IT service provision, and offers the following benefits (OGC, 2002):

- Reduced IT costs;
- Improved IT services through the use of proven best practice processes;
- Improved customer satisfaction through a more professional approach to service delivery;
- Standards and guidance;
- Improved productivity;
- Improved use of skills and experience;
- Improved delivery of third-party services through the specification of ITIL or BS15000 as the standard for service delivery in services procurements.

2.4.5 Challenges in ITSM and ITIL

In any organization, when making changes, managers are faced with challenges and issues. They just need to manage the relationships better.

Some of the issues that IT managers may face include (Golden, 2007):

- Culture change, which is probably the hardest type of change to manage - the change in thinking and communication among the staff.
- Learning to keep it simple, focus on one process at a time and start with simple metrics to help your business partner see value as you go.
Worthen (2005) states that "An organization may have an outstanding network or mainframe group but if each group is focused on optimizing the value of its area, they may not be creating value for the organization as a whole." ITIL provides the language and processes to manage all of an IT department’s efforts, allowing it to function like a well-oiled machine.

The next section of this chapter discusses the other frameworks and standards in the IT Service Management architecture and the relationships between these frameworks.

### 2.5 Other Frameworks and Standards in IT Service Management

Over the years a number of models and frameworks have been developed and implemented in organizations with the goal to improve the management of IT and IT related resources (da Cruz & Labuschagne, 2007). It is necessary to point out that IT Service Management does not exist in isolation; there are other standards and frameworks in process improvement which need to be considered. In a recent study conducted in an Australian Information Technology Service Management Forum, it was found that many organizations are adopting a combination of frameworks; mixing ITIL with other frameworks and guidelines such as Control Objectives for Information and related Technology (CobiT), Capability Maturity Model Integration (CMMI), ISO/IEC 17799/27002, MOF (Microsoft Operations Framework) and BS 15000 (Cater-Steel, Tan, & Toleman, 2005). Below is a brief description of these frameworks and standards, some of which falls under IT Governance.

IT Governance is the internationally accepted standard for control over IT, it is defined as the system by which IT within organizations is directed and controlled. The IT Governance structure specifies the distribution of rights and responsibilities among different members, such as the board, business and IT managers, and spells out the rules and procedures for making decisions on IT. By doing this, it also provides the structure through which the IT objectives are set, and the means of attaining those objectives and monitoring performance (Brand & Boonen, 2005, p. 16).
CobiT

An IT Control and Governance Framework, its main focus is the development of clear policies and good practices for security and control of IT. Its primary goal is the development of control objectives from the business objectives and requirements viewpoint. The underpinning concept of the CobiT framework is that control in IT is approached by concentrating on information that is needed to support business objectives and by looking at information as being the result of the combined application of IT-related resources that need to be managed by IT processes (CobiT, 2000, p. 6).

CobiT creates the link between the business objectives and a specific Information Technology management task. It classifies Information Technology resources into three levels of effort: domains, processes and tasks. Domains are groups of Information Technology processes. A process on its own is a group of tasks. The framework has defined a set of 34 high-level control objectives, one for each of the IT processes, grouped into 4 domains: Planning and Organization, Acquisition and Implementation, Delivery and Support and Monitoring. This framework covers all aspects of information and the technology that supports it. By addressing all 34 high-level control objectives, the process owner can ensure that an adequate control environment exists for the IT environment (Grobler, 2004, p. 82).

ISO/IEC 17799/27002 (Information Technology - Security Techniques - Code of practice for information security management)

This standard provides information security specialists with recommendations for risk assessment, physical and information security policy, governance, compliance and access control. It details hundreds of specific controls which may be applied to secure information and related assets. It comprises 115 pages organized over 15 major sections (Culmsee, 2007).
BS 15000

In November 2000, the British Standards Institutes (BSI) published a new standard for IT Service Management, namely the BS 15000. This standard promotes the adoption of an integrated process approach to effectively deliver managed services to meet the business and customers requirements (Sallé, 2004, p. 13).

In a first part, BS15000 defines high level requirements for a management system that includes policies and a framework to enable the effective management and implementation of all IT services. It then gives recommendation using the Plan-Do-Check-Act methodology for planning and implementing service management. It comprises of:

- Planning service management (Plan);
- Implementing service management and providing the services (Do);
- Monitoring, measuring and reviewing (Check);
- Continuous Improvement (Act).

BS15000 then provides recommendations concerning the planning and the implementation of the new service. This is to ensure that new services and changes to services are deliverable and manageable at the right cost and service quality (Whyte, 2003, p. 27).

Microsoft Operations Framework (MOF)

According to Sallé (2004), MOF “provides technical guidance that enables organizations to achieve mission-critical system reliability; availability; supportability and manageability of IT solutions built with Microsoft products and technologies.” The MOF guidance addresses the people, process, technology, and management issues to support the distributed and complex IT environment.
2.6 The relationship between the different frameworks

The different frameworks and standards serve different roles within the IT Management domain but these frameworks complement each-other. All these frameworks are tools to assist the organization to manage the very important IT related functions and services, so as to limit risk and increase the potential benefit from the IT investment (Viljoen, 2005). Literature reveals that some organizations are in favour of implementing multiple frameworks in their organizations than just one framework. And there is certainly value in this approach, to use the ITIL framework in conjunction with other frameworks to obtain a more complete IT Service Management solution. It is clear that some of these approaches do overlap, as some have a wider scope than others.

The relationship between IT Governance and IT Service Management can be found in the model below in figure 2.2
According to Sallé (2004), an organization evolves through different stages in the IT Management. Firstly, they start with a focus on infrastructure and services management as can be seen in the figure above. This stage is focused on the management of the organization’s infrastructure which may include: internet users, the bandwidth, demographics (organization spanning different locations) and the costs involved. The second stage of the evolution is the IT Service Management where the organization manages the needs of its users and customers. The focus here is on the planning and delivery of high quality IT services. The final stage is IT Governance, where the organization has evolved so much that its IT processes are fully integrated with the business strategy.

What sets IT Governance apart from IT Service Management is that where ITSM focuses on the effective and efficient supply of IT services, IT Governance deals with the demands of contributing to business operations thereby transforming IT to meet the future needs of the business.

IT Service Management together with the components of people, processes and technologies help manage and control the IT services and the IT infrastructure according to the objectives received from the governance (Sallé, 2004, p. 3).

2.7 Conclusion

This chapter has not only described IT Service Management and the ITIL framework, but has also highlighted their role in improving the quality of IT Services. The review of the literature has uncovered a vast amount of information with regards to the role of service management in particular the integration of people, processes, products and services. The literature also uncovered the benefits that organizations can look forward to as well as some challenges that the IT managers in these organizations may face when they implement process improvement strategies.

From the material presented it is clear that at the end of the day it is about results, no organization is going to follow a strategy which does not provide a return on investment. This is why many organizations are embracing the IT Service Management concept,
because they are getting results. Management will be quick to follow a trail of processes that are benefiting the business.

In the next chapter the researcher will go through the overview of the ITIL framework which is all about processes, frameworks and best practices. The ITIL methodology will be discussed. As has been mentioned earlier in the chapter, the version of ITIL that the study is based on is version 2; the ITIL processes discussed in the next chapter are the 11 processes on the two books of Service Support and Service Delivery.
Chapter 3
ITSM approaches focusing on the ITIL Framework

Chapter 2 served as a foundation by introducing the literature required in this research. The chapter included a definition of the concepts of ITSM; it considered the service industry as a whole, also the role that ITSM plays in the organization. The ITIL framework was discussed briefly as well as its processes and procedures. This chapter will provide the insights into the workings of ITIL, in particular, the ITIL service management approach, a framework that is rapidly gaining popularity all over the world. The focus is on service support and service delivery within the ITIL framework.

3.1 ITSM background

IT Service Management evolved starting in the late 1980s promoting a quality approach to achieving business effectiveness and efficiency in the use of information systems (Sallé, 2004, p. 10). IT departments have moved away from being technology providers into being service providers and this has made it necessary to change the perspective of how IT is managed. IT Service Management puts the services delivered by the IT department at the centre of IT management.

This means that the entire IT department has to work like a well-oiled machine, bringing an integration of the people, processes and technology together to deliver the high quality service that the users and customers can be proud of.

Over the years, various ITSM frameworks have been defined to help the organizations move along the transition of IT Service Management. Figure 3.1 below shows how the methodologies have changed over the years.
Back in the 1980s, IT management was not a topic much talked about, the focus then was on IT operations. But as IT systems became widely used and the developments became more complex, organizations started looking at the concepts of systems management. The OGC from the British central government saw the need to maintain control over IT support structures to achieve efficiency, and so in the late 1980s they established a framework as a new approach to IT Service Management with the purpose of ensuring better use of IT services and resources now known as the ITIL framework (Sallé, 2004, p. 10). ITIL rapidly became the de facto standard for IT management. The first ITIL version became an instant success, firstly in the UK and then slowly other countries started to notice the benefits.

With the global acceptance of ITIL as the number one framework for best practice in IT Service Management, came the first formal standard for ITIL processes, known as the BS15000 (Axios Systems Consulting, 2004, p. 3). The standard allowed for organizations to become formally certified against the new standard. BS15000 compliance is all about having the right processes in place and being able to prove it. This would bring competitive advantage to any organization that became certified.
New developments in ITIL have been the release of ITIL version 3 in May 2007 which has made improvements to the version 2 library. The other significant development is the release of ISO/IEC 20000 international standard of IT Service Management. This standard is derived from the British BS15000 standard and is closely coordinated with the IT Infrastructure Library (ITIL) as a Best Practice recommendation for Service Support and Service Delivery.

To achieve ISO/IEC 20000 certification, organizations must successfully undergo a third-party audit by an accredited assessment body. The accreditation is based on an organization demonstrating its competence to carry out specific compliance tasks and the certification based on the evidence related to technology, processes, systems, and people interrelations (Cater-Steel & Toleman, 2007, p. 4).

The next section will explore the ITIL framework in more detail, starting with the methodology of the framework. The different processes within the framework are identified and their functions explained.

3.2  ITSM/ITIL Methodology (version 2)

ITIL is all about processes, frameworks and best practices. This process is an approach to IT Service Management that places emphasis on the importance and value of coordination and control of the process across all the various functions and systems to manage IT services.

ITIL consists of a series of publications giving guidance on the provision of Quality IT Services, and on the Processes and facilities needed to support them (OGC, 2000). The two mostly used books on version 2 are the Service Delivery and Service Support books which this research is primarily based on. The methodology encompasses all the processes in the Service Support and Service Delivery as can be seen in figure 3.2 below.
The following section discusses service support as depicted in Figure 3.3.

**Figure 3.3 Service Support (OGC, 2000, p. 6)**

3.2.1 Service Desk

The OGC (2000) define Service Desk as the “Single Point of Contact between the IT service provider and the users”. A Service Desk is a function rather than a process and typically manages Incidents and Service Requests, and also handles communication with the users. It provides an interface for other activities such as Change Management, Problem Management, Configuration Management, Release Management, Service Level Management and IT Service Continuity Management.

The Service Desk handles the activities related to the many ITIL processes. The diagram in Figure 3.4 is a depiction of how the Service Desk handles these activities.
Some of the responsibilities of the Service Desk function are; log an incident by categorizing it, diagnose it and prioritize it. It then attempts to solve the incident (this is the first line support) and if a solution is not immediately available then the incident will be escalated to the appropriate group or technical support. The last activity is to close all incidents by following the best practices of Incident Management.

Benefits of the Service Desk may include (OGC, 2000, p. 59):

- Improved user service, perception and satisfaction;
- Increased user accessibility via the single point of contact;
- Improved quality and faster response to user requests;
- More effective and efficient use of support resources;
- Better management information to make decision on support.

3.2.2 Incident Management

OGC (2006) defines Incident Management as a process which primary objective is to restore the IT Service to the customers as quickly as possible and with minimal impact to the business operation. A temporary work-around is identified in order to maximize availability.
The Incident Management process starts with logging and tracking all incidents via the Service Desk and maintaining meaningful records. Incidents are categorized as follows: hardware, software, networks, information requests, password changes, new users, service extension requests.

Incidents are tracked by an Incident Management System, like REMEDY Service Desk (BMC: http://www.bmc.com/), HEAT Helpdesk System (FrontRange Solutions Inc: www.frontrange.com) or an in-house system which will track the incident categories and workflows based on the organizational needs. Incident Management works with Problem Management to pass along information that will assist in resolving problems or to alert that new problems may be arising (Shannon, 2007).

Benefits of Incident Management include (OGC, 2000, p. 78):

- Reduced business impact of Incidents by timely resolution, thereby increasing effectiveness;
- Improved monitoring, allowing performance against Service Level Agreements (SLAs) to be accurately measured;
- Better staff utilization, leading to greater efficiency;
- Improved User and Customer satisfaction.

3.2.3 Problem Management

A problem is defined as the underlying cause of one or more incidents or something that may cause future incidents (Shannon, 2007). Problem records are created when Incident Management cannot find the underlying cause of an incident.

OGC (2000) defines Problem Management as the diagnosis of the root causes of incidents in an effort to proactively eliminate and manage them. It is concerned with identifying and resolving IT problems that affect the core IT services.

The objectives of Problem Management are to: identify and resolve IT problems by investigating the root cause; problem control by identifying and recording a problem and error control where an error is identified and a record kept.
Problem Management ensures that data is properly recorded and maintained regularly and that known errors are recorded in the organization's Configuration Management Database (CMDB) (Cognizant Academy, 2004).

Benefits of Problem Management are (OGC, 2000, p. 98):

- Improved IT Service quality and management;
- Increased user productivity;
- Improved support personnel productivity;
- Improved IT Service reputation;
- Enhanced management and operational knowledge and learning;
- Improved incident recording;
- Higher first-line resolution rate.

3.2.4 Configuration Management

Configuration Management deals with the physical and logical perspective of the IT infrastructure and the IT services being provided. Configuration Management (CM) is a methodology for collecting, revising, storing, and retrieving information about a company's IT assets, their configurations, and the relationship between those assets. ITIL recommends that this information be managed by means of a Configuration Management Database (Shannon, 2007). The OGC (2000) defines a CMDB as a federated, controlled repository for assets that are essential for running the business. The CMDB is made up of Configuration Items (CIs) which can be hardware, software, documentation, and services – anything that IT is responsible for. Defining the relationships between CIs is one of the issues that distinguish Configuration Management from asset management.

The CMDB is used and integrated with other ITIL processes like, Incident, Problem, and Change Management. With the CMDB in place, the IT department staff will be able to see how assets are related to each other and be able to create the relationship names and types. This will help with diagnosing problems and thinking about how the changes will affect the IT environment (Shannon, 2007).
Benefits of Configuration Management (OGC, 2000, p. 125):

- Providing accurate information on CIs and their documentation;
- Controlling valuable CIs;
- Facilitating adherence to legal obligations;
- Helping with financial and expenditure planning;
- Making software Changes visible;
- Contributing to contingency planning;
- Supporting and improving Release Management;
- Improving security by controlling the versions of CIs in use;
- Providing Problem Management with data on trends.

3.2.5 Change Management

Change Management is a process of controlling changes to the infrastructure or any aspects of services, in a controlled manner, enabling approved changes with minimum disruptions. (Shannon, 2007). The Change Management process is initiated when an IT staff member submits a request for change (RFC). The RFC describes the desired outcome, usually in business-relevant terms. The diagram in Figure 3.5 shows the process flow of Change Management as described in OGC (2000).
Some of the benefits of Change Management are (OGC, 2000, p. 179):

- Better alignment of IT services to business requirements;
- Increased visibility and communication of changes to both business and service-support staff;
- A reduced adverse impact of changes on the quality of services and on SLAs;
- Fewer changes that have to be backed-out, along with an increased ability to do this more easily when necessary;
- Improved Problem and Availability Management through the use of valuable management information relating to changes accumulated through the Change Management process;
- Greater ability to absorb a large volume of Changes.

3.2.6 Release Management

Release Management offers a systematic framework for large or critical hardware rollouts, major software rollouts or bundled sets of changes. It takes into account all the aspects of a release from initial release policy and planning through to development, testing and controlled implementation (OGC, 2000, p. 203). It is a process that protects the 'live' or production environment by following a plan for the releases. For a large rollout of either software or hardware, once the quality assurance department has done all its work in the approval of the implemented change, and then Release Management takes over.
Release Management is responsible for coordinating, scheduling and testing the release packages. Release Management is driven by Service Level Management based on the agreements that the IT department has with the other business units, agreements about the available software and hardware. Release Management is also linked to Change Management because it is driven by the changes. It generates the following databases; a Definitive Software Library (DSL) which is a definitive store of all the authorized versions of software in the organization and also a Definitive Hardware Library (DHL) which is the definitive store which stocks the hardware of the organization as well as the spare parts, like the laptops, power supplies, memory modules, network cards, etc. The details of these software and hardware libraries will be updated in the CMDB (Shannon, 2007).

Benefits of Release Management include (OGC, 2000, p. 212):

- A greater success rate and consistency in the release of hardware and software;
- Minimisation of the disruption of the service to the business as the release process protects the 'live' environment;
- Stable test and live environments;
- Better use of User resources;
- Better expectation setting within the organization on publication of a Release schedule in advance.

The following section discusses Service Delivery as depicted in Figure 3.6.
3.2.7 Service Level Management

Service Level Management is responsible for designing and negotiating service level agreements with the customers of the Service Desk. It aims to ensure a satisfactory quality of IT service provision by setting agreed targets between the IT department and customer. A process of monitoring, reporting and reviewing of actual service levels highlights any problem areas and facilitates continuous service improvement (OGC, 2001, p. 27).

Service Level Management is there to make sure that there is alignment between the IT services and the business requirements. Shannon (2007) states that to achieve this, the organization would go through a cycle of: receiving business requirements, negotiating the levels of service, checking that the organization has underpinning strategies in place with the internal support and external suppliers and finally receiving the targets with the
business to see where improvements can be made, this is known as the continuous improvement program.

Some basic concepts of SLM include the service catalogue, the Service Level Agreement (SLA), the Operational Level Agreement (OLA) and Underpinning Contracts. An organization will create a service catalogue which outlines what products and services are being offered or delivered, this catalogue would then be taken to management as part of the initial negotiation process. Once the approval is received from management, then a SLA is defined, this is the end product that an organization wishes to come up with which is the written agreement between the business and the IT service provider (Shannon, 2007). This agreement would outline the expectations for the business and the targets that need to be met.

The SLA should be written in a simple, understandable language and should clearly state the services that are provided. It needs to focus on the core non-negotiable services that are common to all business units.

The SLA is supported by the OLA and the underpinning contracts. An OLA is an agreement between the IT service provider and the internal organization, basically an agreement between the Service Desk and the support teams. An OLA is there to help make sure that the response times, fix times and prioritization are supported internally. Externally the organization uses an underpinning contract with outsource companies and suppliers. This is a more formal contract/document which outlines the typical services that the outsourced company will bring into the organization (Shannon, 2007).

One of the major benefits of the administration activities of the SLA is the reporting. Reports can be generated to determine how often the service levels are being breached, how many Service Desk calls were recorded for a specific month, how many resolutions were done at the Service Desk, etc.

Some benefits of a Service Level Management process include (OGC, 2001, p. 29):

- IT Services are designed to meet Service Level Requirements;
- Improved relationships with satisfied Customers;
• Both parties to the agreement have a clearer view of roles and responsibilities – thus avoiding potential misunderstandings or omissions;
• There are specific targets to aim for and against which service quality can be measured, monitored and reported – *‘if you aim at nothing that is usually what you hit’*;
• Service monitoring allows weak areas to be identified, so that remedial action can be taken.

3.2.8 Availability Management

Availability Management is the process concerned with the design, implementation, measurement and management of IT services which ensures that all IT systems and services are functioning as required and that availability is sustained in a reliable and cost-effective way. With the supply and provision of information companies need to consider security management as well to prevent unauthorized use of information (Cognizant Academy, 2004, p. 5).

The goal is to optimize the capability of the IT Infrastructure, and services by determining the availability requirements of the business and matching these to the capability of the IT Infrastructure and supporting organization. If there is a gap then Availability Management makes sure that the organization is provided with alternatives (Shannon, 2007).

All ITIL processes are linked in some way or another to the IT availability process, which means that Availability Management interfaces with all the other processes. Incident Management and Problem Management provide a key input to ensure the appropriate corrective actions are being progressed. It also supports the Service Level Management process in providing measurements and reporting to support service reviews (OGC, 2001, p. 221).

Some Benefits of Availability Management include (Cognizant Academy, 2004, p. 17):
• Optimal use of the capability of the IT Infrastructure according the agreed requirements;
• Single point of accountability;
• Cost justification of investments;
• Improvement of Business continuity.

3.2.9 IT Service Continuity Management

IT Service Continuity Management is the process that ensures that major failures of technical equipment or facilities associated with IT Service provision are managed efficiently and service levels are restored back to an acceptable level within agreed timeframes (HPDC, 2006, p. 306). It focuses on all IT services that are needed by providing a framework for developing IT infrastructure recovery plans in support of the critical business processes to keep them running.

IT Service Continuity involves the elements of Business Impact Analysis and Disaster Recovery Planning. Business Impact Analysis is conducted with the customers in order to verify which major systems must be recovered and also to help determine the effects of an interruption of those systems.

Disaster Recovery Planning works with IT staff to translate recovery requirements into infrastructure options and data storage requirements (OGC, 2001, p. 169).

The service continuity process also links to the other ITIL processes i.e. Service Level Management, Availability Management, Configuration Management, Change Management and the Service Desk (HPDC, 2006). Configuration Management data is required to facilitate the prevention and planning activities. Changes to the business need to be assessed for their potential impact on the continuity plans and should be subject to Change Management procedures. The Service Desk has an important role to play if business continuity is involved (OGC, 2001, p. 167).

Some Benefits of IT Service Continuity Management include (OGC, 2001, p. 164):
• It supports the Business Continuity Management process and delivers the required IT supporting Infrastructure;
• Positive marketing of contingency capabilities;
• Organizational credibility; and
• Competitive advantage through the demonstration of the contingency capabilities.

3.2.10 Capacity Management

Capacity Management is the process which aims at aligning IT service level provision to the current and future business needs. It is concerned with optimizing the usage of existing IT resources as well as ensuring new resources are made available in a timely and efficient manner (OGC, 2001, p. 121). Capacity Management is involved in Incident resolution and Problem Identification for those difficulties relating to capacity issues.

Capacity Management process involves, monitoring of performance of IT services and the infrastructure that support those services, recommending tuning activities that would make the best use of the resources, understanding the current demands on IT resources and then making forecasts for future requirements, and finally producing a capacity plan which will be used by the IT department to meet the SLAs (OGC, 2001, p. 131).

Capacity Management also links with the other ITIL processes in order to improve those processes. It links with Financial Management for the budgeting, accounting, and charging purposes. It links with Availability Management for the availability metrics which are frequently captured and stored by Capacity Management and included in the Capacity Plan. It also links Service Level Management by controlling the SLAs and helping to negotiate appropriate SLAs with the business units (OGC, 2001, p. 154).

3.2.11 Financial Management for IT Services

Financial Management of IT Services is the process which provides essential management information on IT asset and service costs. Through a process of budgeting
and accounting true costs are revealed and the value of IT to the business can be demonstrated (OGC, 2001, p. 61).

The scope of IT Financial Management is IT budgeting, IT accounting and charging, although many of the activities involved are often managed by the financial division within an organization. Budgeting is a process of predicting and controlling the expenditure within the organization, while IT accounting is the process which enables the IT organization to account for where money is spent on running the department and lastly, charging is the process of billing customers for services (HPDC, 2006, p. 280).

Financial Management processes are integrated with the other ITIL processes, i.e. Service Level Management, Capacity Management, Configuration Management and the Finance Department of the organization in order to identify the costs of the service (OGC, 2001, p. 62).

### 3.3 Other segments in the ITIL Framework

These segments will not be covered in this study but a brief description of each follows:

#### 3.3.1 IT Security Management

IT Security Management is the process that ensures the confidentiality, integrity and availability of an organization's assets, information, data and IT services. IT security management usually has a wider scope than the IT service provider (OGC, 2006). IT Security Management in the ITIL framework is a book on its own and not part of either service support or service delivery because it can be integrated with all ITSM processes where security issues are involved.

This process provides common terminology and well understood concepts so that the people in the organization can clearly understand the reasons behind the security policies and procedures that the IT department has documented. It also highlights the risks to the organization should these policies not be followed.

#### 3.3.2 Business Perspective
The Business Perspective series was published to bridge the gap between business and IT management. The book covers a range of issues concerned with understanding and improving IT service provision, as an integral part of an overall business requirement for high quality IS management. These issues include; Business Continuity Management, Partnerships and Outsourcing, Surviving change and Transformation of business practice through radical change (HPDC, 2006, p. 16).

3.3.3 ICT Infrastructure Management

The ICT Infrastructure Management’s goal is to use proven, repeatable processes to provide a stable operating environment for all IT functions. The four areas that make up this service are: Network Service Management, Operations Management, Computer Installation and Acceptance and Systems Management (OGC, 2000, p. 15).

3.3.4 Application Management

Application Management describes an approach to the Software Development Lifecycle. It covers creating the application specifications; designing the application; writing and testing the code; deploying the application; routine operation of the application; and, finally, reviewing the application once it is in operation to determine ways to improve its efficiency and cut costs. Applications Management expands on the issues of business change with emphasis on clear requirement definition and implementation of the solution to meet business needs (OGC, 2000, p. 15).

3.3.5 Software Asset Management

This service overlaps Application Management and most of the other services in ITIL. This service covers processes to maximize software as an asset while minimizing the risks. Software is a major asset for an organization when looking at its cost and its ability to drive the business objectives (OGC, 2006).

3.4 Conclusion
The first part of the chapter gave an overview of IT Service Management and how it has evolved over the years. Then the chapter discussed the ITIL framework (version 2) and its processes. The overview did not cover all the aspects of the framework comprehensively but the discussion served to highlight the extensive and multi-faceted nature of the framework and ITSM. The ITIL methodology was explored and each ITIL process was defined and discussed in terms of its objectives, the process flow or activities, the relationship with the other processes and also the benefits that may be realized by an organization which has implemented the processes.

The researcher observed that most if not all the ITIL processes interrelate with each other in some way and in some cases are totally dependent on others. OGC (2000) refers to this relationship as the Jigsaw concept where all the processes are integrated in order to achieve one common goal. Therefore there is a whole lot of business value that can be achieved just by structuring and standardizing the way the IT department runs its processes.

The next chapter will analyze the IT Service Management in the Higher Education sector in South Africa.
Chapter 4

Analysis of ITSM in Higher Education

This chapter serves as the backbone of the theory required to identify the current state of ITSM/ITIL implementation in Higher Education in South Africa. The knowledge gained here will be used to identify the gap between where higher education is presently positioned and where it should be compared to the ITIL processes.

Chapter 4 includes a discussion of the following key concepts:

4.1 The Education Environment
4.2 Information Technology’s Role in the business (Higher Education)
4.3 Business Value of IT
4.4 IT Strategic Technologies for the Future
4.5 Alignment of business and IT strategy in Higher Education

These key concepts are important in this study as they will show how the education sector is embracing the ITSM strategy, and how some of the new technologies in the IT field are being handled by the institutions in their IT departments.

4.1 The Education Environment

The environment in which any organization functions, determines the strategies that it will employ to survive in that rapidly changing environment. Information Technology in the education environment has moved past the stage of merely being used for analysis processes which has now become critical to education delivery. Certain trends in the industry necessitate change in the way education is delivered. Trends that are becoming ingrained in society include; lifelong learning, where the education process in any person’s career does not necessarily end when they leave the university; new competencies, where individuals have to have the technology ‘know-how’ in order to
stay on top of things as most industries are being changed by technology and then there is telecommuting, where individuals are working from home in a “virtual office”, and all this knowledge explosion needs to be managed (Twigg & Oblinger, 1996, p. 1). Any institution which wishes to remain competitive would have to be aware of factors like globalization, increased demand and a push for increased productivity. There is also a change in the perception of quality management. There are impending changes in the environment, a shift in the teaching and learning methods which has necessitated a different approach in education delivery.

The Higher Education sector’s objective is that they have the responsibility of creating leaders and the citizens of tomorrow above and beyond the core mandate of teaching, research and community outreach (FEDUSA, 2008). This means that universities must be able to become self sufficient and find ways to stretch the funds they get from the department to create programs that would be conducive to producing graduates who can think critically and who can solve problems in their country.

In South Africa the Department of Education has emphasized three important areas in which education institutions must succeed, these are (Department of Education, 2001):

- Human resource development – the ability for the students to be fused into society and the industry and improve the current South African as well as international work environment;
- High level skills – students must be able to compete on a national and international level for high quality positions;
- Research outputs – the industry must benefit from research both locally and internationally; but especially locally. The Department of Education recognizes the importance of good research and duly rewards the institutions with subsidies.

South African education is in crisis mode at the moment, according to a Finweek report. The report has cited a number of issues that are facing education system in South Africa. One very serious issue is the shocking skills shortage coupled with the lack of resources which would equip the nation for future growth (News24.com, 2008).
Some other issues facing the education sector include the increasing costs of higher education and the pressure being put on the student funding bodies, which for many institutions are the primary source funding for the students. Another issue is that of the education system being unable to produce sufficient numbers of academically ready candidates into higher education, this may be due to inflexible legacies of the past. The learning achievements remain poor, especially amongst the poor in the provinces; this may be due to poor planning by the regional education departments to reveal the needs of the students (HESA, 2008, p. 2).

In the Finweek report (News24.com), it is also revealed that in addition to the education crisis, South Africa is losing skilled professionals to other countries who use South Africa as hunting ground for recruitment. A study recently found that the loss of one skilled professional in SA costs up to 10 unskilled jobs. This will have a negative impact on the Service Delivery in higher education institutions and the industry as a whole.

This impact might be in a form of budget cuts to the various regional departments because of poor planning and administration.

4.2 Information Technology’s Role in the business (Higher Education)

A review of literature reveals that there has been an increase in interest in technology in many higher education institutions in South Africa. According to Czerniewicz, Ravjee and Mlitwa (2007), Higher Education institutions are spending more of their budgets on ICT infrastructure than in previous years in the face of a poor ICT infrastructure, nationally and in higher education.

Some of the Roles that IT can play in any organization are mentioned below (Marden, 2005):
• IT can help the organization to facilitate better communication, information sharing becomes easy and the business processes are streamlined which adds great value to the business.
• With an ever-growing need for information, there is a requirement for increased data quality that is complete and up-to-date. This information is essential to the day-to-day operation of the business.
• The web is the medium through which users actively communicate and provide service. Web Portals and SharePoint sites are playing an ever-increasing role in supporting organizational processes and a number of success factors play a role.
• IT departments have a duty to ensure that there are mechanisms for secure and stable accessibility to the IT systems and data and that the data can be accessed by human, by time, by location and by design.

IT can be used to assist and accomplish other specific business roles in higher education institutions; these include those of being an infrastructure driver, collaborations agent, and an enabler of globalisation (mobility). These are discussed in more detail below.

**Collaborations** – IT facilitates better collaboration between the departments and between the organization and external suppliers. Online collaborations help enhance the planning, decision-making and day-to-day operations of the employees (Dutcher, 2008).

**Mobility** – The use of smart phones like Blackberries, iPods, iPhones, etc has really enhanced the way people communicate. There are added benefits for both the students and employees in higher education. For the students, these can be used to download course material, research material and for SMS notifications. For employees, it is a great tool to improve communication, for project collaboration and document sharing (Dutcher, 2008). Unfortunately the majority of our student population is not able to afford these expensive mobile devices.
Infrastructure – South Africa is regarded as an advantaged country compared to the rest of Africa when it comes to ICT infrastructure. The country has more fixed lines, mobile subscribers and Internet users than most other African countries. Infrastructure is regarded in terms of bandwidth, demographic divides, internet users, cost and cell phone subscriptions. Bandwidth is an issue at institutional level. As educational institutions; there are less or lenient restrictions on bandwidth usage. Details of bandwidth availability and usage within HE can be located from Tenet (Tertiary Education Network - [www.tenet.ac.za](http://www.tenet.ac.za)), which obtains Internet bandwidth on behalf of South African tertiary institutions (Brown, 2008). This was done under what has been known as the GEN2 agreement, with Telkom as the supplier. When the contract ended in December 2007, Tenet went out to tender for a new supplier. Two companies were selected as the new service providers, these are Internet Solutions and Neotel, and the resulting GEN3 contract came into effect.

Minister of Science and Technology, Mr Mosibudi Mangena in his address at the SATNAC 2008, said that the Department of Science and Technology (DST) has provided funding of R95-million to provide low-cost broadband links to the local academic community by implementing a high-speed South African National Research Network (SANReN), aimed at the science, engineering and the technology fraternity which will give them ‘infinite computational power, infinite bandwidth and infinite data capability’ (Mangena, 2008). The SANReN network is designed specifically to provide the research community in South Africa with a very high capacity Next Generation Network which will be provided by Tenet.

Preparations have already started around the country with the laying of Fibre Optic cables. The Port Elizabeth SANReN ring once fully implemented will effectively remove local connectivity bottleneck. The impact that this increase in bandwidth will have in the way that education is delivered is very significant. The researchers and scientists in South Africa will be able to collaborate with their peers and partners globally on science, engineering and technology projects thereby making South Africa a major world player in ICT.
4.3 Business Value of IT

Even though less than half of today's businesses are developing business value and Return on Investment (ROI) to justify IT spending, that trend is changing quickly. Going forward, IT departments must develop business value justification and ROI to fund new IT projects. This is demonstrated by increasing pressure on IT managers to justify IT investments via traditional internal functions such as increasing IT staff time on innovation versus operations (Evergreen, 2006). ROI is an interesting debate because businesses tend to see any IT project as a cost. IT managers have to constantly sell ideas to Top Management and to the Board because they talk a different language to IT, they want to see as much savings as possible.

In the education environment the student is seen as a customer and a product. The education process of an individual in South Africa typically starts at the primary school level, proceeds to the secondary school level and then to tertiary level.

Value is added to the student by equipping him/her with the necessary knowledge, the skills and the expertise to facilitate economic as well as social and cultural development. The learning experience and the service to the student during this period are valued by the student. The student has the freedom to choose from a variety of courses and he/she learns at his/her own pace with adequate resources. Therefore IT in Higher Education needs to add value to its core customer, the student, and in turn business value is provided and IT is the enabler.

The value added to the labour market is the availability of eager graduates with the potential for improved productivity, efficiency and valuable skills and abilities.

In summary it can be said that the business value of IT is of critical importance to many institutions in South Africa, not only public organizations. All that Top management want to see are results. They want to be assured that the benefits far outweigh the risks involved in new innovative IT projects and that RIO is realized and the same applies in IT in Higher Education Institutions.
4.4 IT Strategic Technologies for the Future

In the context of international developments, the review of Higher Education in South Africa would not be complete without a look at some top technologies and trends which industry as well as higher education institutions are faced with in the near future. These trends may be seen as challenges by some but also as great opportunities by other organizations to help them in their quest for the advancement of organizational goals and objectives.

Gartner Inc. analysts have highlighted the top technologies and trends that they predict will be strategic for most organizations in the next couple of years. Organizations would be wise to have a closer look at these opportunities and evaluate where these technologies can add value to the business services.

An interview was conducted with one of the ICT System Engineers at the NMMU to give more insight into what the NMMU is doing with each of these trends. The style of the interview was a personal interview and it was unstructured. These trends are discussed in this section.

4.4.1 Virtualization

Computer Guru (2008) defines server virtualization as a technology which enables multiple operating systems (MS Windows/Unix) to run on a single physical machine as virtual machines (VMs). By consolidating physical systems in a single, more powerful system, the system administrator can reduce the IT system’s power and cooling requirements. Each virtual machine has its own set of virtual hardware; i.e. CPU, memory, network card amongst other upon which an operating system and applications are loaded.

There are a number of commercial and open-source virtualisation applications available, Xen parlance and VMware ESX and Microsoft had introduced Hyper-V which comes pre-installed in Windows Server 2008. Each application has its advantages and disadvantages. For example, VMware has limited device driver compatibility which
makes it hard to run on any hardware, while Xen parlance, the device and file system support is provided by the Linux kernel.

At NMMU, the virtualization has started with a number of servers being consolidated on a single piece of hardware. The setup at the moment is having 4 – 7 virtual machines on a single physical hardware using the application VMware which is a standard in industry. One of the system engineers is busy investigating Microsoft’s HyperV to determine whether the hardware at the institution will be compatible with it or not.

Some of the benefits of virtualization include that; with fewer physical machines, there is reduction in costs through lower hardware and energy consumption. Virtualization also leads to better capacity planning, higher availability, smarter resource sharing, and simpler heterogeneous storage infrastructure management (Computer Guru, 2008).

4.4.2 Blade Servers

Originally conceived as a niche product for huge computing data centers, blade servers are slim servers-on-a-rack which have become like the Swiss army knife of modern computing. According to Savvas (2008), they represent the fastest-growing segment in the server market and they are being put to use in everything even serving as replacements for desktop machines. A few users can connect to a single blade server that is segmented into several virtual machines.

This evolution of blade servers has made significant changes in the technology which will simplify the provisioning of capacity to meet growing needs of the users. According to McCall and Stevens of Gartner (2008), some of the improvements that blades provide in the server environment include blade server aggregation, where two blades are logically joined; creating a single logical server that can then be used at the bare-metal level. The servers will have faster I/O connections, more flexible storage solutions and an easy integration with virtualization.

At NMMU, the use of blade servers has not been considered mainly because of costs, this is according to Mr Bruce Smith (2008), ICT System Engineer. For the NMMU environment and because of the layout it is also not feasible as the institution is divided
into different campuses at different locations. The cost of each Chassis would be more than it would cost to buy 7 Quad-Core Processor servers. He points out though that having blade servers is good for high-density processing.

Gartner predicts that by 2010, blade servers will account for 20% of all servers sold, but this figure can be easily surpassed judging by how things are going at the moment.

4.4.3 Web-oriented architectures

According to Savvas (2008), the Internet is arguably the best example of an agile, interoperable and scalable service-oriented environment in existence. This level of flexibility is achieved because of key design principles inherent in the Internet/Web approach, as well as the emergence of Web-centric technologies and standards that promote these principles. Web-oriented Architecture (WOA) is one such technology which has taken the industry by storm. According to Hinchcliffe (2008), Steve Bjorg defines WOA as “an alternative to Service-Oriented Architecture. WOA is fundamentally about "open" systems that communicate over "open" and established protocols and formats. In WOA, HTTP takes center-stage as the communication protocol between applications and web-services.” Integration between the systems running the business is still an elusive concept; however in the last couple of years; there have been promising developments from the Web which are pointing a way to a better model that seems to overcome many of the adoption and effectiveness issues experienced in industry. Gartner predicts a continued evolution in the Web-centric approach during the next five years (Savvas, 2008).

4.4.4 Specialised systems (Heterogeneous Server Systems)

Burback (1998) defines Heterogeneous Server Systems as “a distributed system environment which contains many different kinds of hardware and software working together in cooperative fashion to solve problems i.e. where the owner installs software to accomplish a function.”
Heterogeneous systems are an emerging trend in high-performance computing to address the requirements of the most demanding workloads, and this approach will eventually reach the general-purpose computing market (Savvas, 2008, p. 5).

At NMMU, there are various specialized systems used in the different faculties and departments across the institution. The Auditing department has commissioned an auditing team-work system; the Health Sciences department have special health-checking systems for testing various ailments. The Chemistry department has specialized chemical analysis systems, like the Gas Chromatography Mass Spectrometry (GCMS). The Mechatronics department have their Robotics systems.

4.4.5 Social software and Social networking

Social and business networking sites are changing the way people talk online. Social software includes a wide range of technologies, such as social networking and collaboration. Organizations should consider adding a social dimension to their website or application and should adopt a social platform to their intranets as this is a great way of getting the people’s voices heard (Savvas, 2008, p. 6). Sites like Facebook, MySpace and LinkedIn, etc, help friends and business users to stay in touch. They seem to have come out of nowhere. For example, Facebook had 1 million active users in the UK in February 2007. According to PC World, today it has over 90 million users worldwide. This poses a great deal of problems for IT managers including time lost because employees abuse company time to access these sites during work hours, and also there are the hidden threats of viruses, spyware and identity theft. At NMMU, the Arts department has found a way to use such social network sites like Facebook to create groups for sharing ideas and collaborate on projects. ICT Services at NMMU is in a process of commissioning online chat/discussion software that will be set up for both students and staff.

4.4.6 Business intelligence

Business Intelligence (BI), the top technology priority in Gartner's 2008 CIO questionnaire, can have a direct positive impact on an organization’s business
BI is a technology used mainly by middle management and knowledge workers who work in an ongoing partnership with internal users, maintaining in-depth knowledge of business operations, strategies, priorities, information and technology requirements to enable quality decision making. They use BI tools to make all the data stored within an organization meaningful by generating meaningful reports.

4.4.7 Green IT

Green IT is the practice of using new technology such as virtualisation, as well as sustainable product design, with green computing equipment that features advanced power management. Green computing is all about conserving power and also the reuse or recycling of hardware and other resources. Energy-efficient technology can help an organization achieve social responsibility targets (Savvas, 2008, p. 7).

At NMMU, the Technical Services department have implemented ripple controls on the geysers and air-conditioners across the institution so that when the appliances are not being used they can be on standby thereby conserving power.

Much of the new hardware is more environmentally friendly and users can take advantage of lower-power PCs, LCD monitors also tend to draw less power than CRTs, and more efficient switches and routers are available that can help cut operating costs.

This section above looked at Gartner’s top technology trends for the next couple of years and the idea here is to make organizations aware of what is available and to try and evaluate these technologies and then adjust their business processes based on their industry needs, their unique business needs, and other factors. ITIL Service Support and Delivery processes discussed in Chapter 3 can be applied to businesses to help combat these challenges and threats. This will be done by establishing repeatable IT processes for the planning, managing, and budgeting of the new technologies. The processes will help with clarification of roles and responsibilities, and also by improving the availability of systems and applications.
The next section of the chapter will look at the alignment of the business to the IT strategy.

### 4.5 Alignment of business and IT strategy in Higher Education

The heart of IT management is a communication of the organization’s priorities and this is the same in a manufacturing environment as well as the higher education environment. Some of the priorities of IT management include; IT planning, IT governance, Communication and measurement assessment. Institutions that engage in effective IT planning, governance, communications and measuring are perceived as doing a better job of aligning IT investments with broader institutional priorities (Educause, 2004, p. 6).

Strategic alignment has been viewed as one of the main concerns of management and the IT departments. Organizations have realized that in order to achieve competitive advantage, IT needs to be strategically aligned with business objectives. IT strategy alignment enables organizations to choose IT applications that meet their needs and as a result, to enhance their profitability and reduce costs. Despite the importance of this matter and a large body of literature written on this subject, it has not yet been identified how this alignment can be successfully achieved and maintained.

In an ECAR study under the Educause Research Center, it was found that some higher education institutions are starting to go in the direction of IT alignment, about 85 percent of the questionnaire respondents agreed that there was alignment between the central IT department priorities and institutional priorities. Only 45 percent indicated that they think of institutional planning as a continuous process, and only 28 percent noted that their IT strategic plans addressed "planning for an unknowable future." (Voloudakis, 2005).

ITSM addresses the need to align the delivery of IT services closely with the needs of the business. Leopoldi (2005), in his whitepaper has come up with a few attributes that have been transformed from the traditional "business" paradigm to the "IT paradigm" as shown in Table 4.1 below:
Traditional I/T  

<table>
<thead>
<tr>
<th>Traditional I/T</th>
<th>becomes</th>
<th>ITSM Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology focus</td>
<td>➔</td>
<td>Process focus</td>
</tr>
<tr>
<td>&quot;Fire-fighting&quot;</td>
<td>➔</td>
<td>Preventative</td>
</tr>
<tr>
<td>Reactive</td>
<td>➔</td>
<td>Proactive</td>
</tr>
<tr>
<td>Users</td>
<td>➔</td>
<td>Customers</td>
</tr>
<tr>
<td>Centralized, done in-house</td>
<td>➔</td>
<td>Distributed, sourced</td>
</tr>
<tr>
<td>Isolated, silos</td>
<td>➔</td>
<td>Integrated, enterprise-wide</td>
</tr>
<tr>
<td>&quot;One off&quot;, ad hoc</td>
<td>➔</td>
<td>Repeatable, accountable</td>
</tr>
<tr>
<td>Informal processes</td>
<td>➔</td>
<td>Formal best practices</td>
</tr>
<tr>
<td>IT internal perspective</td>
<td>➔</td>
<td>Business perspective</td>
</tr>
<tr>
<td>Operational specific</td>
<td>➔</td>
<td>Service orientation</td>
</tr>
</tbody>
</table>

Table 4.1 Transformation of Business paradigm to the IT paradigm (Leopoldi, 2005)

The IT Strategy that an institution generates needs to be of high value as it will help improve the planning, improve the alignment of IT with educational and business objectives, reduce IT complexity, and position IT as a valued investment.

### 4.6 Conclusion

This chapter described the analysis of ITSM in Higher Education in South Africa. An overview of the education environment was discussed which looked at the objectives of higher education as dictated by the Department of Education. The findings were correlated with literature review where relevant.

The role of IT in higher education was reviewed and the researcher found in literature that IT does play a major role in most organizations, be it manufacturing, academic or
non-profit. IT is seen as a driver for specific business roles which bring about value to the organization. In Higher Education the student is seen as both the customer and a product, therefore IT in higher education needs to add value to its core customer, the student which in turn will bring about business value.

The chapter also considered the IT strategic technologies which Gartner researchers have identified and predict will be strategic for most organizations in the next couple of years. Organizations need to be aware of what is available and make the necessary adjustments to their business processes.

Lastly the alignment of business and IT strategy in higher education was investigated. Strategic alignment has been viewed as one of the main concerns of management and the IT departments. The challenge, according to Educause (2004) is to align the IT strategic planning, IT governance, communications, and measurement with the business objectives to ensure that an organization and its IT department have the same strategies, plans, and results.

The next chapter is the research design for the empirical study. The chapter will describe the research methodology used in the study and the tools used for data collection.
Chapter 5

Research Design and Results

5.1 Introduction

This chapter provides an overview of the methodology that was used in the study as well as the tools used for data collection with justification for choosing the method. The chapter includes the findings from the responses to the questionnaire and a discussion of each question in relation to the literature presented in the previous chapters.

5.2 Research Design

Trochim (2006) defines Research Design as the “glue that holds the research project together”, it is used to structure the research, to show how all of the major parts of the research project come together to try to address the main research questions.

There are many approaches to research methods, but the two methods that were considered in this study are the qualitative and quantitative research methods. In Qualitative research; the researcher aims to study objects in their natural settings. A researcher gathers words or pictures, analyzes them inductively, focuses on the meaning of participants, and describes a process that is both expressive and convincing (Trochim, 2006). In Quantitative research (survey research); the aim is to ask a standard set of questions and nothing more. It is an inquiry into an identified problem, based on testing a theory, measured with numbers, and analyzed using statistical techniques.

For the purpose of this study qualitative research approach was adopted. The reason for conducting qualitative research as there is a need to present a detailed view of the topic.
Qualitative research consists of a variety of approaches to interpret research from; the following are the commonly used research designs (Trochim, 2006):

- Case study - an intensive study of a specific individual or specific context;
- Ethnography – comes largely from the field of anthropology where an entire culture is studied;
- Phenomenological study – sometimes considered a philosophical perspective, where a researcher wants to understand how the world appears to others;
- Grounded theory - is to develop theory about phenomena of interest and the theory needs to be rooted in observation.

For the purpose of this study case study is the selected method. A brief discussion follows:

There is no single way to conduct a case study, and a combination of methods (e.g., unstructured interviewing, direct observation) can be used. In a case study the researcher explores a ‘case’ restricted by time and activity and collects information through a variety of data collection methods over a period of time. There are two types of case study designs:

- Single-case study - used to represent a unique single case.
- Multiple-case study - contains a collection of cases (Tellis, 1997).

As the focus of this research is on the NMMU only, a single case study approach was used.

5.3 Case Study

The primary research question for this study is:

What is involved in IT Service Management and how can the NMMU implement it to improve the quality of IT service support and service delivery?
In order to assist in resolving the main research question, the following three sub-questions were identified:

- What is involved in IT Service Management?
- What is the status of ITSM in Higher Education?
- What are the recommendations for an effective framework solution?

In order to answer these questions, the following research techniques were employed:

5.3.1 Literature Review

An in-depth literature study was undertaken on the concept of IT Service Management and the approaches which would be adopted by organizations. The information was analyzed to determine which solution best suits the NMMU. Literature from the NMMU and other tertiary institutions Libraries in South Africa was consulted to determine the feasibility of the study. Internet searches were also used to find relevant information.

5.3.2 Interview

An in-depth interview was conducted with the NMMU ICT System Engineer to obtain more insight into what NMMU is doing with the current technological trends in the IT Environment.

5.3.3 Questionnaire

A Questionnaire was administered to gauge the maturity level of the higher education institutions around South Africa.

An electronic questionnaire was selected for the purpose of this research as it is relatively cheap in that an email is sent out with the link to the electronic questionnaire. The next section discusses the content of the questionnaire in more detail.
5.4 Status of the ITSM adoption in HE in SA specifically ITIL (Process Maturity)

Limited literature relating to the implementation of ITSM in higher education institutions around the world is available. In a recent study conducted by Ken Turbitt of BMC (2007), he states that South African institutions are missing the point of ITIL. The study revealed some compliancy flaws in the HE sector. Even though HE is different from the manufacturing industry, the way the processes and activities are carried out is the same. IT systems in most SA organizations especially in higher education institutions are still traditionally organized around functional areas with little or no integration between the systems resulting in the splitting of simple processes into illogical processes.

This next section investigates the maturity of ITSM/ITIL processes in higher education institutions around South Africa. Assessing organization maturity is critical to ITIL implementation as the maturity indicates how much of ITIL to implement. An organization’s maturity level is measured by a number of predefined maturity models which define five levels that an organization passes through in order to be more competent. In a mature organization repeatable practices becomes the norm. The higher the organizational maturity the more efficient, effective and economical are its operations.

When assessing the maturity level of ITIL processes in higher education institutions in SA – a questionnaire was used to gauge the maturity level of the higher education institutions around South Africa.

The questions for the questionnaire were derived from a list of questions compiled by Rick Leopoldi (2005) in his Alternative ITSM Maturity Assessment Approach. According to Leopoldi, the majority of ITIL and ITSM Maturity Assessment methods focus on people, process, technology/tools, and organization factors and would typically use a part of the IT Service Capability Maturity Model (ITSCMM) with maturity phases such as Initial, Repeatable, Defined, Managed and Optimizing. This list of questions is not extensive but is rather a starter kit and can be used as part of the qualification method.
for assessing CMM Maturity levels for how well IT is performing against the ITIL framework.

These questions were used to determine how well each process is doing if it is implemented. The respondents from different HE institutions answered 19 questions regarding their IT Service Level Management implementations.

5.5 Data collection

Data collection was done by means of an online questionnaire which was distributed to different HE institutions in South Africa.

5.6 The population

A list of candidates for the study was obtained from the Deputy Director of NMMU’s ICT Service Delivery, who identified about 26 senior IT staff from the various Higher Education Institutions in South Africa and they were invited via email to participate in the questionnaire accompanied by a covering letter which was distributed online. The participants were given a cut off date of 30 September 2008 to complete the questionnaire which can be viewed in Appendix A.

A pilot questionnaire was distributed to the top IT personnel at the NMMU to test the responses before the questionnaire went out externally.

5.7 Reliability and Validity

The selected sample is representative of the HE community. Statistics SA point out that in order to ensure validity, the sample must be representative of the whole population and must simulate the real world as closely as possible.
5.8 Results of the Questionnaire

In this section, the responses to the questionnaire are compiled in a series of tables and charts and the important findings are highlighted.

The questionnaire recorded the name of the institutions to identify duplicate forms from any institution. It also recorded the functional level in the IT department and the number of years experience in IT.

Below is a list of the institutions from which results were received:

- University of the Free State (UFS)
- Central University of Technology (CUT)
- Cape Peninsula University of Technology (CPUT)
- University of Fort Hare (UFH)
- Nelson Mandela Metropolitan University (NMMU)
- University of Western Cape (UWC)

5.8.1 Overall Response Rate

As shown in Table 5.1 below, the response rate was quite low, therefore the sample was small (n=6). Of a total of 26 people that the questionnaire was distributed to, a total of 6 respondents completed the questionnaire. This total makes up 23% of the total responses.

<table>
<thead>
<tr>
<th>Response Rate</th>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents</td>
<td>6</td>
<td>23%</td>
</tr>
<tr>
<td>Non-returns</td>
<td>20</td>
<td>77%</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 5.1 Responses from the overall questionnaire
5.8.2 Analysis of Biographical Data

Respondents were asked to indicate their functional level in the IT department and also the number of years experience in IT; the responses are reflected in Table 5.2.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number (n=6)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>2</td>
<td>33%</td>
</tr>
<tr>
<td>Management</td>
<td>1</td>
<td>17%</td>
</tr>
<tr>
<td>Senior Management</td>
<td>3</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Table 5.2 Distribution of Respondent Position in IT Department**

The majority of respondents were Senior Managers in their IT department which constituted 50% of the total sample population. IT Operational (33%) and IT Managers (17%) were also indicated. This is indicates a good distribution as the sample departments are represented at all the levels of management in IT.

5.8.2.1 Responses according to the number of years’ experience

<table>
<thead>
<tr>
<th>Number Of Years</th>
<th>Number (n=6)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 years</td>
<td>1</td>
<td>17%</td>
</tr>
<tr>
<td>5 – 10 years</td>
<td>3</td>
<td>50%</td>
</tr>
<tr>
<td>11- 20 years</td>
<td>1</td>
<td>17%</td>
</tr>
<tr>
<td>21 – 30 years</td>
<td>1</td>
<td>17%</td>
</tr>
<tr>
<td>More than 30 years</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 5.3 Number of year’s experience**

The majority of respondents had between 5 - 10 years experience in IT which constituted 50% of the respondents. Figure 5.1 below outlines the ranges, 17% of the respondents had less than 5 years experience, 17% had between 11 – 20 years experience, and 17% had between 20-30 years experience.
The analysis of answers received from the questionnaire with regards to the ITIL processes will be discussed in detail in the following section.

5.8.3 Analysis of the results

The rationale behind the questionnaire has been to gauge the level of maturity of the ITIL Processes in Higher Education Institutions around South Africa, and how these processes stack up compared to the best practices for each ITIL process and function. Furthermore to identify the benefits and problems associated with each function.

In most cases, an IT department with relatively unstructured IT Service Management processes will be delivering a mediocre quality service. This is because the organization would have a few bits of processes here and there which work but they are not formalised. A maturity level assessment will then ascertain what needs to be done, what needs to be captured and formalised.

Questions were based on ITIL version 2 and were available for all the processes within the scope of IT Service Management, i.e. those in the ITIL Service Support and Service Delivery domains. Appendix A contains the complete Questionnaire – ITIL Process Maturity Questionnaire.

The results from the questionnaire will be discussed under the following headings:

5.8.3.1 Adoption of the ITSM Frameworks

5.8.3.2 ITIL implementation
5.8.3.3 Process Implementation

5.8.3.4 Extent of implementation of ITIL functions & processes

5.8.3.5 ITIL Training and Certification

5.8.3.6 Benefits of ITIL

5.8.3.7 Maturity Level

5.8.3.1 Adoption of the ITSM frameworks

Table 5.4 below is a summary of the responses received when asked which IT Service Management frameworks have been adopted in the institution?

<table>
<thead>
<tr>
<th>Framework</th>
<th>Fully Adopted</th>
<th>Partially Adopted</th>
<th>Adoption in its early life</th>
<th>Not Adopted at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>CobiT</td>
<td>0</td>
<td>2 (33%)</td>
<td>1 (17%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>ISO 17799</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>ISO/IEC 20000</td>
<td>0</td>
<td>2 (33%)</td>
<td>1 (17%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>ITIL</td>
<td>1 (17%)</td>
<td>2 (33%)</td>
<td>3 (50%)</td>
<td>0</td>
</tr>
<tr>
<td>ITS CMM</td>
<td>0</td>
<td>2 (33%)</td>
<td>0</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>MOF</td>
<td>0</td>
<td>1 (17%)</td>
<td>0</td>
<td>5 (83%)</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Six Sigma</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TQM</td>
<td>0</td>
<td>2 (33%)</td>
<td>0</td>
<td>4 (67%)</td>
</tr>
</tbody>
</table>

Table 5.4 Implementation of ITIL and other frameworks

When asked about current initiatives related to ITSM, the most used initiative was ITIL with 50% of the respondents, even though they reported that the adoption was in its early life, while 33% had partially adopted it and only 17% had fully adopted the ITIL framework.

The results of the other frameworks in ITSM which the respondents were asked to indicate their adoptions were:
50% of the respondents reported that they have not adopted CobiT, ISO17799 and ISO/IEC20000.

67% of the respondents reported that they have not adopted TQM and ITSCMM.

83% of the respondents reported that they did not adopt MOF.

33% of the respondents reported that they partially adopted the following frameworks, ITIL, CobiT, ISO/IEC20000, TQM and ITSCMM.

Figure 5.2 shows the different frameworks and their adoption state:

![Figure 5.2 Frameworks](image)

5.8.3.2 ITIL implementation

When asked if they considered implementing other frameworks, 67% of the respondents indicated that they did consider implementing more than one framework, with 33% not considering it. From these figures it can be assumed that the institutions that have responded are more in favour of multiple frameworks than just one framework.
In question 3.1 of the questionnaire, the respondents were invited to motivate their answer to the question why multiple frameworks were considered.

Of the respondents, 17% provided no motivation for their answer, but below are the responses given:

- In the process of implementing ITIL & CobiT;
- ITIL’s focus is on Service Management and CobiT’s focus is more strategy;
- Found that a combination of frameworks and Standards were needed. One could not cater for all the needs;
- We want to bring in CobiT at a later stage.

The benefits of having multiple frameworks implemented are summarized below:

The effective adoption of multiple frameworks and best practices can provide many benefits. Research has indicated that most organizations should combine CobiT, ITIL and ISO 17799 frameworks for a complete service management solution (ITGI, 2005). These best practices need to be aligned with the business objectives and integrated with one another.

CobiT will be used at the highest level providing an overall control framework based on an IT process model that is suitable for any organization. ITIL and ISO 17799 are more specific as they cover discrete areas, ITIL deals with Service Support and Service Delivery processes while ISO 17799 deals with information security management. They can both be mapped to the CobiT framework thus providing a structure of guidance materials (ITGI, 2005, p. 6).

Question 4 of the questionnaire addressed the issue of why the institution elected ITIL.

Table 5.5 shows that most respondents reported that it was for a better control of IT Infrastructure (57%), 14% cited aligning IT with business, cost-justified IT provision and improving quality of IT Service provision as some of the other objectives of choosing
ITIL. One responded said that they were eventually expecting cost savings in the long run.

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Align IT with business</td>
<td>1</td>
<td>14%</td>
</tr>
<tr>
<td>Better control of IT Infrastructure</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>Cost-Justified IT Provision</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Improve quality of IT Service provision</td>
<td>1</td>
<td>14%</td>
</tr>
<tr>
<td>Other: Eventually we expect cost savings</td>
<td>1</td>
<td>14%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

*Table 5.5* Primary Objective of choosing ITIL

ITIL provides a systematic and professional approach to the management of IT service provision. As can be seen from the response above (57%), their primary objective of choosing ITIL is that of the better control of the IT infrastructure. From a longer term perspective, ITIL can ease the pain of a continuously changing IT infrastructure through standard IT policies, processes and procedures.

Studies have shown that the implementation of tools, processes and best practices based on IT Service Management and ITIL framework, have shown a significant return on investment, including measurable cost savings to the IT department (Axios Systems Consulting, 2007).

Figure 5.3 is the graphical representation of the Primary Objectives of choosing ITIL.
5.8.3.3 Process Implementation

Process Implementation, was designed to determine which of the ITIL Service Processes were covered by each institution in the adoption of ITIL best practice. The question allowed for multiple responses. As shown in Table 5.6 below, the Service Desk is the process that was selected first by most of the respondents (67%) with Incident Management coming in at number 2. The numbers 1 to 11 in the table represent the processes which are listed on the left hand side. They are there to show the order of the processes being implemented.
<table>
<thead>
<tr>
<th>ITIL Process</th>
<th>Process Implemented and order of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Service Desk</td>
<td>4 (67%) 1 (17%) 0 0 0 1 (17%) 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>2. Incident Management</td>
<td>0 4 (67%) 0 0 0 0 1 (17%) 0 0 0 0 0 0</td>
</tr>
<tr>
<td>3. Problem Management</td>
<td>0 1 (17%) 0 1 (17%) 2 (33%) 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>4. Change Management</td>
<td>1 (17%) 1 (17%) 2 (33%) 0 0 1 (17%) 0 0 0 0 0 0</td>
</tr>
<tr>
<td>5. Release Management</td>
<td>1 (17%) 1 (17%) 0 0 0 1 (17%) 1 (17%) 0 0 0 0 0 0</td>
</tr>
<tr>
<td>6. Service Level Management</td>
<td>1 (17%) 0 1 (17%) 1 (17%) 0 0 0 1 (17%) 0 0 0 0 0</td>
</tr>
<tr>
<td>7. Configuration Management</td>
<td>1 (17%) 1 (17%) 0 0 1 (17%) 1 (17%) 1 (17%) 0 0 0 0 0 0</td>
</tr>
<tr>
<td>8. Availability Management</td>
<td>0 1 (17%) 0 1 (17%) 0 0 0 0 1 (17%) 0 1 (17%) 0 0</td>
</tr>
<tr>
<td>9. Capacity Management</td>
<td>0 0 0 1 (17%) 0 0 0 0 0 1 (17%) 0 0 0 0</td>
</tr>
<tr>
<td>10. Financial Management</td>
<td>1 (17%) 0 0 1 (17%) 1 (17%) 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>11. IT Service Continuity Management</td>
<td>0 1 (17%) 0 0 2 (33%) 0 0 0 0 0 0 1 (17%)</td>
</tr>
</tbody>
</table>

Table 5.6 ITIL Process Implementation

This section concentrated on the technical side of the ITIL Process function. The questions were based on a basic list of those measurement metric questions that relate to direct and indirect, tangible and intangible business benefits that can be realized. This list was not exhaustive but rather a starter set that could be used as part of the qualification method for assessing Maturity quantifications for how well IT is performing as a service provider (Leopoldi, 2005).
A standard ITIL maturity assessment analyzes each of the following process areas:


The service support processes are intended to help organization to gain control of the incident lifecycle, from when an incident first develops until a system change or a new release permanently fixes it. (OGC, 2000).

Service Delivery processes include Availability Management, Capacity Management, Availability Management, Financial Management, Service Level Management, and IT Service Continuity Management.

Service delivery covers the processes required for the planning and delivery of quality IT services, and looks at the longer-term processes associated with improving the quality of IT services delivered (OGC, 2001).

5.8.3.4 Extent of implementation of ITIL functions & processes

In order to rank the implementation progress of the ITIL processes, a series of questions were asked depending on whether the process was implemented or certain procedures were in place in that institution.

1. Service Desk

The Service Desk is the primary point of contact for customers and users with the IT department on a day-to-day basis and is crucial in delivering a quality service to the client. Question 5 of the questionnaire asks the respondents to select one or more of the following options in table 5.7 below, that apply to the role of the Service Desk in their institutions:
From the data gathered about the Service Desk function, 67% of the respondents have indicated that the following 4 functions are the primary roles that the Service Desk plays in their institutions:

- Call logging and prioritization;
- 1st Line Support;
- Service Level Tracking which also includes Incident tracking;
- Service Level Escalation.

This is in line with what the experts recommends as the primary roles that the Service Desk has.

The table below, Table 5.8 sums up the extent of the implementation of each process from the series of questions which were asked and depending on whether the process was implemented or certain procedures were in place in that institution. These are the responses from questions, 7 – 16 of the questionnaire.

<table>
<thead>
<tr>
<th>The role of the Service Desk</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Desk doesn’t play a role</td>
<td>2</td>
<td>33%</td>
</tr>
<tr>
<td>Call Logging And Prioritisation</td>
<td>4</td>
<td>67%</td>
</tr>
<tr>
<td>1st Line Support</td>
<td>4</td>
<td>67%</td>
</tr>
<tr>
<td>2nd Line Support</td>
<td>2</td>
<td>33%</td>
</tr>
<tr>
<td>Call Closure</td>
<td>3</td>
<td>50%</td>
</tr>
<tr>
<td>Service Level Tracking – Incident Tracking</td>
<td>4</td>
<td>67%</td>
</tr>
<tr>
<td>Service Level Escalation - Escalation of incidents</td>
<td>4</td>
<td>67%</td>
</tr>
<tr>
<td>User satisfaction questionnaire</td>
<td>3</td>
<td>50%</td>
</tr>
</tbody>
</table>

Table 5.7 Role of the Service Desk
<table>
<thead>
<tr>
<th>ITIL Service Support Function/Process</th>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service Desk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Incident Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Are incidents resolved quickly and with minimal impact to the business?</td>
<td>4 (67%)</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
</tr>
<tr>
<td><strong>Problem Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Has the impact of Problems been reduced since the implementation of a formal process</td>
<td>2 (33%)</td>
<td>2 (33%)</td>
<td>2 (33%)</td>
</tr>
<tr>
<td>• Has the cost to Users been reduced?</td>
<td>2 (33%)</td>
<td>2 (33%)</td>
<td>2 (33%)</td>
</tr>
<tr>
<td><strong>Configuration Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Change Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is there a formal process for assessing impact on other services when making changes?</td>
<td>2 (33%)</td>
<td>2 (33%)</td>
<td>2 (33%)</td>
</tr>
<tr>
<td>• Are all changes reviewed prior to implementation?</td>
<td>1 (17%)</td>
<td>3 (50%)</td>
<td>2 (33%)</td>
</tr>
<tr>
<td><strong>Release Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is there provision for testing the releases before implementing in the live environment?</td>
<td>2 (33%)</td>
<td>1 (17%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td><strong>Service Level Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is SLA reporting in place to measure if the SLA is being met?</td>
<td>1 (17%)</td>
<td>2 (33%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>• If SLA reporting is in place, are you in a position to meet the service levels agreed upon?</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td><strong>Availability Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is availability management cost effective in your environment?</td>
<td>2 (33%)</td>
<td>1 (17%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td><strong>Capacity Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is there an increased ability to demonstrate cost effectiveness?</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>• Is there a Capacity Management plan that is reviewed regularly with resources allocated accordingly?</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td><strong>Financial Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Does the business believe the IT financial management process is effective?</td>
<td>2 (33%)</td>
<td>0</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>• Are customers satisfied with costs and charges of IT services?</td>
<td>(17%)</td>
<td>1 (17%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td><strong>IT Service Continuity Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is there awareness throughout the Institution of the Business and IT Continuity Plans?</td>
<td>2 (33%)</td>
<td>1 (17%)</td>
<td>3 (50%)</td>
</tr>
</tbody>
</table>
The results depicted in Table 5.8 can be interpreted as follows:

**For Incident Management:**

67% of the respondents agreed that incidents are being resolved quickly and with minimal impact to the business, while 17% did not agree and another 17% were not sure.

**For Problem Management:**

It was an even 33% when asked if the impact of problems has been reduced since the implementation of a formal process; and if the cost to users has been reduced. This result means that it is not possible to get a clear answer because each institution is different and they results may vary depending on how far the implementation of the process is.

**For Change Management:**

33% of the respondents said there was a formal process for assessing the impact on other services when making changes, while 33% said there was no formal process. Another 33% were not sure.

Only 17% of the respondents agreed that all the changes were being reviewed prior to implementation, while 50% said no and 33 % were not sure.

**For Release Management:**

When asked if there was provision for testing the releases before implementation in a live environment, 33% of the respondents agreed, while 17% said no, the majority of the respondents, 50% were not sure if there was provision made.

**For Service Level Management:**

Only 17% of the respondents said that there was SLA reporting to measure if the SLA was being met, 33% said reporting was not implemented while 50% were not sure if there was SLA reporting.
For the respondents who had SLA reporting in place, the next question asked was if SLA reporting was in a position to meet the service levels which were agreed upon? 17% said the IT department was in a position to meet the service levels while 17% said no and 67% were not sure.

**For Availability Management:**

When asked if Availability Management was cost effective in their institutions, 33% agreed that it was, while 17% said no and 50% of the respondents were not sure. This again comes back to the question of measure. It will depend on how far the process has been implemented before the outputs are measured.

**For Capacity Management:**

17% of the respondents agreed that there was an increased ability to demonstrate cost effectiveness when the Capacity Management process was implemented, while 17% said no and 67% were not sure.

When asked if there was a Capacity Management plan that is reviewed regularly with resources allocated accordingly, 17% of the respondents said there was a Capacity Management plan in place, while another 17% said there was no plan and 67% of the respondents did not know if the plan existed.

**For Financial Management:**

When the respondents were asked if they thought that the business believed the IT Financial Management process was effective, some of the responses that came back revealed that, 33% thought the business believed in the effectiveness of the Financial Management process, and another 67% were not sure.

When asked if their customers were satisfied with the costs and charges of IT services, 17% of the respondents agreed that their customers were satisfied with the costs and charges, while another 17% said their customers were not satisfied, and 67% were not sure.
For IT Service Continuity Management:

The question on the awareness of the business and IT continuity plans came back with the following responses; 33% of the respondents agreed that there was awareness throughout the institution of the plans, while 17% said there were no plans and 50% were not sure if the plans existed.

In summary, from the above results the researcher can conclude that organizations are implementing the processes of the ITIL framework with the main priority being the Service Desk function and Incident Management process. Even though the organizations are making progress in the implementation of the framework, the low percentages in terms of understanding of the process, the impact that each process activity has on the organization, indicate that there is still a lot to be done in terms of realizing benefits.

5.8.3.5 ITIL Training and Certification

The questionnaire enquired about the extent of ITIL training and certification undertaken.

As shown in Figure 5.4, 83% of the respondents agreed that it is beneficial to have IT staff certified in ITIL. The respondents were invited to motivate or explain why they thought it was beneficial to be certified, below are the responses given:

- The awareness created seems to stimulate creative thinking and co-operation from staff.
- Training IT staff in ITIL allows everyone to understand best practices, processes, and concepts. It also creates awareness and a culture for adopting best practices.
- More staff members are putting a lot of effort to understand the principles of ITIL. More are getting used to the terms and hence the requirements of ITIL standards. There is an improvement especially with the way that ICT staff members conduct themselves at work. The attitude has changed dramatically.
• They have a much better understanding of the importance of the quality of the service delivery they providing.
• The greater understanding of ITIL is starting to get the staff to think in terms of providing a service and not just running an application or infrastructure etc.

17% of the respondents did not believe it was beneficial to get all the IT staff ITIL certified and they did not give reasons, but one respondent said they only got certified in late August 2008, and were not yet experienced enough to answer.

![ITIL Certification Graph](image)

**Figure 5.4 ITIL Certification**

The results above reflect that most of the respondents believe that it is beneficial to get the IT staff certified. This really clearly emphasizes the need for training and certification.

5.8.3.6 Benefits of ITIL

Question 17 of the questionnaire asked the respondents on their overall impression of how ITIL best practice framework has improved IT Service Management in their institutions. Table 5.9 below shows the different views or perceptions of the respondents while figure 5.5 is the graphical representation. 50% of them said that ITIL had improved somewhat their ITSM strategy, while 17% said service improved considerably another...
17% said the service has remained the same and another 17% said they were uncertain. In all of the mixed reviews, none of the respondents said the service had declined since the implementation of ITIL.

<table>
<thead>
<tr>
<th>Improved considerably</th>
<th>Order</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved somewhat</td>
<td>2</td>
<td>3</td>
<td>50%</td>
</tr>
<tr>
<td>Has remained about the same</td>
<td>3</td>
<td>1</td>
<td>16.67%</td>
</tr>
<tr>
<td>Has declined considerably</td>
<td>4</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Uncertain</td>
<td>5</td>
<td>1</td>
<td>16.67%</td>
</tr>
</tbody>
</table>

**Table 5.9 Overall impression of ITIL**

The majority of the respondents, 4 out of 6 (67%) indicated that improvements are visible and this is very encouraging.

**Figure 5.5** Perceptions improvement with ITIL

5.8.3.7 The Maturity Level section of the questionnaire allowed the respondents to rate their Institution’s maturity level on a scale of 0 – 5; ranging from 0 (as 'absence of process') to 5 (as 'an optimized process'). The maturity level model in table 5.11 was
used to give the respondents an explanation of each level in order for them to make informed decision about where they believe their organization’s level is.

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>MATURITY</th>
<th>DESCRIPTION</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absent</td>
<td>There is absolutely no evidence of any activities supporting the process</td>
<td>0</td>
<td>16.67%</td>
</tr>
<tr>
<td>1</td>
<td>Initial</td>
<td>There are ad-hoc activities present, but we are not aware of how they relate to each other within a single process.</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>Repeatable</td>
<td>We are aware of the process but some activities are still incomplete or inconsistent; there is no overall measuring or control.</td>
<td>4</td>
<td>66.67%</td>
</tr>
<tr>
<td>3</td>
<td>Defined</td>
<td>The process is well defined, understood and implemented.</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
|       | Process      | · Tasks, responsibilities and authorizations are well defined and communicated  
· Targets for quality are set and results are measured  
· Comprehensive management reports are produced and discussed  
· Formal planning is done                                                                                           |       |      |
| 4     | Managed       | Inputs from this process come from other well controlled processes; outputs from this process go to other well controlled processes.                                                                     | 1     | 16.67% |
|       | And Measurable| · Significant improvements in quality have been achieved  
· Regular, formal communication between department heads  
· Working with different processes  
· Quality and performance metrics transferred between processes                                                     |       |      |
| 5     | Optimised     | This process drives quality improvements and new business opportunities beyond the process.                                                                                                                 | 0     | 0%   |
The results obtained from responses to maturity level are tabled below in table 5.11.

<table>
<thead>
<tr>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absent</td>
</tr>
<tr>
<td>1</td>
<td>Initial</td>
</tr>
<tr>
<td>2</td>
<td>Repeatable</td>
</tr>
<tr>
<td>3</td>
<td>Defined Process</td>
</tr>
<tr>
<td>4</td>
<td>Managed And Measurable</td>
</tr>
<tr>
<td>5</td>
<td>Optimized</td>
</tr>
</tbody>
</table>

**Table 5.11 Maturity Level**

Generally the respondents did not have a fully implemented ITIL framework in their institutions and the overall maturity level averaged on 2 – Repeatable “We are aware of the process, but some activities are still incomplete or inconsistent – there is no overall measuring or control”.

In the table above, it shows that 4 (67%) of the respondents have actually started the implementation of ITIL and have a repeatable process. 1 (17%) did not start the implementation, no institution was in the initial state and 1 (17%) indicated that they were in level 4 which is the managed and measurable level. It is not easy to get in this level, so an organization at this level is doing a good job.

According to numerous surveys conducted, only a handful of organizations world-wide achieve the maturity level 5 (Evergreen, 2006).

### 5.9 ASAUDIT Questionnaire Results

The analysis below is from the questionnaire that was sent out by the ASAUDIT Sig SM, which stands for: Association of South African University Directors of Information Technology (ASAUDIT), in their meeting on the 18th and 19th March 2008. A Special Interest Group for Service Management was created with the task to investigate aspects of Service Management. This Questionnaire on ITIL is the result of many months of
research into the kinds of questions needed in order to assess or measure the level of ITIL maturity in the Higher Education institutions in South Africa.

The ASAUDIT coordinator has given permission that the results of this questionnaire may be used to enhance this research study given the small sample size. The questionnaire on Service Management was sent out to all the IT Directors to measure ITIL maturity in the institutions in SA. 17 IT Directors responded to the Questionnaire out of a total of 24 giving a 70% response rate. Please refer to Appendix B to review the complete Questionnaire.

The questionnaire was divided into the following sections:

5.9.1 ITIL Staff Training
5.9.2 Implemented ITIL Processes
5.9.3 Services
5.9.4 Benefits of ITIL

5.9.1 ITIL Staff Training

The ASAUDIT survey looked at the 3 levels of the ITIL version 2 training to measure how much training has been done in each level by the universities in SA.

**Foundation Level**

12% of the respondents achieved a 100% in their Foundation exams, 18% achieved 60-80% pass rate, 24% received in the range of 21-60 % pass rate and the rest 47% received 0-20% pass rate. These results are of concern as the overall pass rate is 36%.

**Practitioner Level**

24% of the respondents achieved a 100% in their Practitioners exams, 6% achieved 60-80% pass rate, 18% received in the range of 21-60 % pass rate and the rest 56% received 0-20% pass rate. These results are very low because most of the universities have not attended the course or written the exam, so the overall pass rate is 32%.
Managers Level

6% of the respondents achieved a 100% in their Managers exams, 6% achieved 60-80% pass rate, 18% received in the range of 21-60 % pass rate and the rest 71% received 0-20% pass rate. The same reason for the low results here is that most of the universities have not attended the course or written the exam, so the overall pass rate is 18%.

From the results above, it is clear that the universities in South Africa need to focus on getting their IT staff trained especially at the Foundation level.

5.9.2 Implemented ITIL Processes

This section dealt with what processes were implemented. The results were the following:

The processes that were implemented first as reported by the questionnaire participants are the Service Desk (59%) and Incident Management (47%) which typically are the first processes that many organizations address. This is followed by Change Management (24%) and Service Level Management (24%). The low number of respondents that chose Service Level Management at number 4 is worrying because the organizations need to engage with the business and align IT services with business demand.

18% of the respondents chose Problem Management at position 5 while Configuration Management came in at position 6 with 18% of the respondents choosing to implement it later in the process. This may be because many organizations fail to present a valid business case for Configuration Management but with an effective CMDB, the impact of changes and releases on each process is identified.

Capacity Management (6%) and Release Management (6%) are positioned at the bottom of the list of processes implemented. Capacity is often forgotten but it not only covers resource Capacity Management but also service and business Capacity Management. Release Management is on the also at the bottom, this could be because
many organizations focus their ITIL efforts on Infrastructure initially and don’t include applications support (PA Consulting Group, 2007).

Availability Management (6%) is also at the bottom, this could be because it is dependent on the type of services that are being supported. The availability of services is one of the most important things to both our customers and end-users so it is surprising that more organizations are not focused on putting effort into implementing this process.

Figure 5.6 is a graphic representation of the processes/functions implemented.

![Figure 5.6 Process/Function Implemented]

5.9.3 Services

This section looked at the Service Level Agreements and the results are the following:

The question: Is there a Service Catalogue that describes the services offered by your IT organization? 8 (47%) of the respondents said there is a Service Catalogue, while 2 (12%) said no and 3 (18%) said the Catalogue was in process of being formulated.
The question: Are there Service Level Agreements (SLA) in place that follows a defined structure? 5 (29%) of the respondents said there are SLAs in place, while 6 (35%) said no and 6 (35%) said the SLAs were in process.

The question: Are agreements with external suppliers (Underpinning contracts) documented and reflected in the SLAs? 8 (47%) of the respondents said there were agreements with external suppliers, while 4 (24%) said no agreements and 3 (18%) said they were in process.

The question: Have all SLAs been accepted (signed off) by customers/business representatives? 4 (24%) of the respondents said all SLAs have been accepted by the customers, while 2 (12%) said no and 7 (41%) said they were in process.

The question: Is there an adequate Service Improvement Plan (SIP) that can be followed when SLAs are seriously breached? 2 (12%) of the respondents said there was an adequate SIP that is being followed, while 11 (65%) said there was no plan. The rest did not give a response to this question.

The question: Does the SLA structure include features such as reliability, security, service hours, support, response times, turnaround times, performance criteria? 6 (35%) of the respondents agreed that the SLA structure has features such as reliability, security, etc. 5 (29%) of the respondents said no feature were included in the SLA while 2 (12%) said they were in process.

The question: Are regular service review meetings held to discuss current and future requirements of the IT organization? 8 (47%) of the respondents said there was regular review meetings held, while 8 (47%) said there were no review meetings.

5.9.4 Benefits of ITIL

This section explored some of the benefits that the institutions felt they received from the implementation of ITIL. The table 5.12 below lists the benefits which are divided into Business, User and IT Organization.
<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business</strong></td>
<td>Cost savings</td>
</tr>
<tr>
<td></td>
<td>Creation of competitive advantage</td>
</tr>
<tr>
<td></td>
<td>Common approach to service levels</td>
</tr>
<tr>
<td></td>
<td>Quality of service delivery</td>
</tr>
<tr>
<td></td>
<td>Understanding of business processes</td>
</tr>
<tr>
<td></td>
<td>Improved IT uptime</td>
</tr>
<tr>
<td></td>
<td>Better support from business on IT spend</td>
</tr>
<tr>
<td></td>
<td>IT service delivery is more measurable</td>
</tr>
<tr>
<td></td>
<td>A clear definition of activities in the ICT Division and the values embraced by the staff</td>
</tr>
<tr>
<td></td>
<td>Business is made to understand what ICT is all about by the values unpacked by ITIL</td>
</tr>
<tr>
<td><strong>User</strong></td>
<td>Improved productivity</td>
</tr>
<tr>
<td></td>
<td>Improved relationships with ICT staff</td>
</tr>
<tr>
<td></td>
<td>Improved service</td>
</tr>
<tr>
<td></td>
<td>Being reliable, expect from IT based on SLA</td>
</tr>
<tr>
<td></td>
<td>Better service offered</td>
</tr>
<tr>
<td></td>
<td>More feedback provided</td>
</tr>
<tr>
<td></td>
<td>Can find out status of their problem effective and approachable</td>
</tr>
<tr>
<td></td>
<td>Improved level of efficiency</td>
</tr>
<tr>
<td></td>
<td>Increased level of confidence in IT as department</td>
</tr>
<tr>
<td></td>
<td>Know what to</td>
</tr>
<tr>
<td></td>
<td>Minimized service interruptions</td>
</tr>
<tr>
<td><strong>IT organization</strong></td>
<td>Better utilization of all IT facilities</td>
</tr>
<tr>
<td></td>
<td>Better understanding of the level of service to be provided - 3</td>
</tr>
<tr>
<td></td>
<td>Being supportive to actual needs</td>
</tr>
<tr>
<td></td>
<td>Building good team relationships</td>
</tr>
<tr>
<td></td>
<td>Developing a common approach to service levels</td>
</tr>
<tr>
<td></td>
<td>Improved relationships between IT and all stakeholders</td>
</tr>
<tr>
<td></td>
<td>Consistency in the execution of support tasks</td>
</tr>
<tr>
<td></td>
<td>Better control of IT changes</td>
</tr>
<tr>
<td></td>
<td>Having a standard which is indoctrinated to all ICT staff</td>
</tr>
<tr>
<td></td>
<td>Understand customer expectations - the importance of having SLAs</td>
</tr>
<tr>
<td></td>
<td>Systematic approach to resolution of all ICT challenges</td>
</tr>
</tbody>
</table>

**Table 5.12 Benefits of ITIL**

This questionnaire has shown the idea that ITSM implementation is not just an out-of-the-box solution and organizations are showing a varied picture of their position to meet their strategic goals and transform IT service delivery.
5.10 A discussion of the key findings of the Questionnaires

The rationale behind the questionnaires has been to gauge the level of maturity of the ITIL Processes in Higher Education Institutions around South Africa, and how these processes stack up compared to the best practices for each ITIL process and function.

By using the two questionnaires above, and analysing the results thereof, a few key findings have been identified:

1. Adoption of the ITSM Frameworks

Current initiatives related to ITSM sees ITIL on top with 50% of the respondents having implemented it but the adoption is in its early life.

2. Implementing other frameworks

The institutions that have responded are more in favour of multiple frameworks than just one framework. And there is certainly value in this approach, to use the ITIL framework in conjunction with other frameworks to obtain a more complete and comprehensive service management solution. One framework could not cater for all the needs. CobiT could be used at the highest level providing an overall control framework; ITIL and ISO 17799 cover specific areas and can be mapped to the CobiT framework thus providing a structure of guidance materials.

3. Primary Objective of choosing ITIL

From the responses, the primary objective of choosing ITIL is shown to be that of the better control of the IT infrastructure. From a longer term perspective, ITIL can ease the pain of a continuously changing IT infrastructure through standard IT policies, processes and procedures. Studies have shown that the implementation of tools, processes and best practices based on IT Service Management and ITIL framework, have shown a significant return on investment, including measurable cost savings to the IT department (ITSMnet, 2008).
4. Benefits of ITIL - overall impression

To date there has been little research undertaken into ITIL implementation. In South Africa, Potgieter, Botha and Lew (2005) conducted a case study with a government organization and concluded that both customer satisfaction and operational performance improve as the activities in the ITIL framework increase (Cater-Steel, Tan and Toleman, 2006). This is also confirmed by the results of the researcher’s questionnaire as well as the ASAUDIT questionnaire.

5. Maturity Level

Higher education institutions in South Africa are currently placed at maturity level 2 (Repeatable) which means: “We are aware of the process, but some activities are still incomplete or inconsistent – there is no overall measuring or control”.

The respondents and literature are in agreement that higher education can be placed much higher, around level 3 or 4 if the right processes are followed. According to numerous questionnaires conducted, only a handful of organizations world-wide achieve the maturity level 5.

6. Process Implementation

Although all the ITIL functions and processes are being implemented by most of the respondents, Service Desk, Incident Management and Change Management were being implemented first.

In most cases, an IT department with relatively unstructured IT Service Management processes will have a few bits of processes here and there which are not formalised. A maturity level assessment then ascertains what needs to be done, what needs to be captured and formalised.

7. ITIL Training and Certification

The results reflect that most of the respondents believe that it is beneficial to get the IT staff certified. This really clearly emphasizes the need for training and certification. From the ASAUDIT questionnaire this is also confirmed by the pass rates of the
institutions that have attended and written the ITIL foundation, Practitioner and Managers exams. From the results it is clear that the universities in South Africa need to focus on getting their IT staff trained especially in the Foundation level because there is a unique opportunity since demand grows for IT staff qualified to various levels, particularly the foundation levels.

5.11 Conclusion

This chapter was an overview of the research methodology that was used in the study as well as the tools used for data collection with justification for choosing the method. The findings from the responses to the questionnaire were analyzed and a discussion of each question in relation to the literature presented in the previous chapters was presented.

Based on the findings, it can be concluded that there are gaps between where the South African Higher Education Institutions are compared to ITIL's process maturity model.

The next chapter will conclude the research with some recommendations for the NMMU, conclusions and suggestions for future research.
Chapter 6
Recommendations and Conclusion

6.1 Introduction

In chapter 5 the findings of the questionnaires were analyzed. This chapter contains recommendations for the NMMU based on the literature study and the empirical study as well as the results from the ASAUDIT. The questionnaires considered processes being implemented, ITIL training and certification, the benefits of ITIL implementation as well as the maturity level of the ITIL processes. This chapter will also describe the constraints of an ITIL implementation and then will end with some concluding remarks.

6.2 Recommendations

The following recommendations are offered:

Many organizations today depend on IT to survive and this has led to more complex systems and applications that are used within organizations which make for a very complex business-processing environment. There is also the constant threat of changing and emerging technologies which organizations need to be aware of. ITIL Service processes can be applied to the business to counter these challenges and threats.

The solution needs to deliver IT business value across the organization. Rodriguez (2007) states that this is done by fully aligning the IT service delivery with the goals of the business and the processes on which the business operates.

In order to successfully implement ITIL, an understanding of the process life cycle is required. From the literature study and the results of the questionnaires, the following criteria were identified for the selection of suitable ITSM/ITIL best practices for use in Higher Education in South Africa.
The following steps have been adapted from an article in the May 2007 issue of the CIO Magazine written by William Golden (Golden, 2007). It is the recommended checklist to run before an implementation of the ITIL process.

The **first step** for the IT department is to have a clear vision for what it wishes to accomplish and where it wants to go, that is to determine goals.

The **second step** is to get Top Management support. The success of any project depends on the cooperation of all parties involved, from Top Management right down to the clerks in the administration offices. Lack of commitment from senior executives has been shown to be a limit to successful implementation.

The key role players include: Key stakeholders who are going to sponsor the project and give their full support, Business Unit Managers, and users of the business systems.

An ITIL business case should be presented to Top Management for approval. The business case should highlight a preliminary analysis of the organization, which includes the proposed restructure of the organizational units. It should also provide the cost-benefit analysis which will focus on the financial aspects of the project because as said earlier in Chapter 4, Top Management tends to see any IT Project as a cost.

The **third step** is to communicate with and get buy-in from the business and the IT staff. The main problem here is to communicate the effects that the changes will have on the organization and the organizational structure. The affected areas need to ensure that they can carry on with their business operations with minimal disruptions.

People play a vital role in most business processes. The implementation of the ITIL framework should provide a rich environment for people to play their part in the process and efficiently complete the work items necessary to progress the process.

The **forth step** is to choose the approach. The researcher recommends choosing the practical approach. There is a much more practical approach to implementing ITIL which offers a much better efficiency and effectiveness of the ITIL adoption. This approach first looks at the needs of the organization and then integrates and automates ITIL processes.
This approach is more suitable to the unique needs of the organization as it is customizable. An organization can choose which processes to start with and adapt them to suit their needs. It considers the people and issues of cultural change which makes it easy to sustain the ITIL processes throughout the organization.

The **fifth step** is to determine the biggest opportunity for value, or where this will immediately benefit the business, and start there. What the researcher recommends is to treat the ITIL implementation as a project and then start by developing the processes first. The organization should start with Incident Management and Change Management so they know what they are capturing and have the capability to measure it with an ITIL framework then in place.

The **sixth step** is to understand the current key performance indicators; this is done by benchmarking the activities of the IT department to determine how well it is performing against the recommendations of the ITIL framework. A Maturity Level Assessment tool can help measure the maturity of an organization’s ITIL processes against the ITIL guidelines and provides recommendations on how to improve existing processes. This provides valuable information concerning the strengths and weaknesses in an organization’s Service Management operation.

The **seventh step** is to develop simple metrics to calculate and communicate improvements in services. Once the maturity level assessment is done, the goal is to end up with a close representation as possible of what exactly exist. Only then can an organization begin to identify improvement opportunities. These opportunities were identified from the answers that the respondents gave when rating each of the elements of the ITIL processes.

In terms of Technology and IT Infrastructure, the institution has a fairly large IT environment but it will have to acquire the needed systems to support the new process. The ITIL framework does not dictate which tools to use but because of the complexity of the ITSM processes, it is difficult to rely on a single tool to manage all the processes. There are lots of vendors out there who have developed tools for ITSM and ITIL. The following companies have developed their own frameworks based on ITIL; HP has
developed the ITSM Reference Model, Microsoft has the MOF Process Model and IBM the Systems Management Solution Lifecycle. This implies that an organization can choose which toolset will suit them better. They could even develop their own in-house tools.

The eighth step is to think long-term goals for the IT department and make sure that the processes are integrated. To better understand how these processes integrate, consider this example life cycle of an Incident, taken from the OGC Service Delivery book:

“A User calls the Service Desk to report response difficulties with a service. The Incident Management process deals with Incident. The Problem Management process investigates underlying cause and calls in Capacity Management to assist in this process. Service Level Management is alerted that the SLA has been breached. The Request for Change (RFC) is raised and this is coordinated by the Change Management process. The IT Financial Management process assists with the business case cost justification for any upgrade. The IT Service Continuity process gets involved in the Change Management process to ensure recovery is possible onto current back-up configuration. The Release Management process controls the implementation of the Change by rolling out replacement hardware and software. Release Management updates Configuration Management with details of new Releases and versions. The Availability Management process is involved in considering the hardware upgrade to ensure that it can meet the required availability and reliability levels. The Configuration Management process ensures the Configuration Management Database (CMDB) information is updated throughout the process.” (OGC, 2001, p. 7).

As can be seen from this example above, all the processes do integrate at some point.

The ninth step is the Communication and Awareness Campaign. The purpose of an awareness campaign is to ensure a clear focus on the objectives and goals of all the process improvement efforts undertaken, which is the ITIL implementation. This awareness campaign could be in a form of various presentations across the organizations. This could be organized by departments. Other methods to
communicate the project could be the organization’s Intranet Portal, Information/announcement boards, Lunchtime Workshops, etc to educate as well as get the buy-in from the various areas that will be affected by the changes of the implementation. With a clear communication strategy in place, there will be a channel to take in the valuable feedback from the various stakeholders in the organization.

The **final step** is to keep sight of IT department’s vision and constantly check the progress against it. The researcher recommends using a Continual Process Improvement program, which sets out to Define, Control, Measure and Improve the effectiveness and efficiency of the organizations processes.

### 6.3 The Implementation Constraints

Key challenges to the success of the project can be identified as:

Some implementation constraints for the project include difficulty convincing top management to support the project. The IT department may have trouble engaging affected business managers. Without a clear go-ahead from the top, the business may simply lose interest or divert resources onto other initiatives during the project.

Changes to the organizational structure and associated roles and responsibilities go hand-in-hand with significant changes in the process. As with all organizational change, there will be natural resistance that will need to be carefully planned and managed. People do not like change, even if it will make their jobs easier.

The initial Costs of the implementation will have to be addressed. The costs would come from the acquisition of external consultants who may be called in to assess the different business areas and also the ITIL tools and techniques that will be chosen.

Training will play a big part in supporting the changes and will require careful planning. In many organizations, the training budget is not carried against the project itself as the different functional areas are training their staff anyway. But with the ITIL training, the IT department would have to coordinate with the different business units to see if they could combine their training budgets to accommodate the ITIL training needs.
6.4 Recommendations for further research

The research warrants further research as there is more to IT Service Management and the ITIL framework than what this research has uncovered. There is a new version of ITIL (Version 3) which was released in May 2007 which has its own set of books and in this version, the way the ITIL processes are managed has changed slightly.

The further study could investigate the management of these processes and the comparisons between the different versions.

One recommended research area within the ITSM paradigm could be the integration of ITIL and the other standards and frameworks into the curricula of Higher Education in South Africa and around the world.

6.5 Final Conclusions

To this end, the researcher set out to resolve the main problem of the study:

How the NMMU can implement the ITIL Framework to improve the quality of IT service delivery and support?

In order to help resolve the main problem, sub-problems were developed and addressed in chapter 2 to 5 by means of a literature study and questionnaires. The sub-problems identified were:

- What is involved in IT Service Management?
- What is the situation of ITSM in Higher Education in South Africa?
- What are the recommendations for an effective framework solution?

By answering the sub-problems, the main problem is answered. The reason that many organizations do not realise the full potential of ITIL implementation is because it is not correctly implemented. It should be part of IT Governance where IT strategy is aligned with the business strategy.
The literature study revealed that ITSM has evolved over the years, and continues to do so at a rapid rate. ITSM has a major role to play in the success of organizations today. ITSM is critical in today’s business as it includes the entire organization and beyond. The resultant output from the research was that of a better understanding of the ITSM solution, the role that it has to play, the strategy options it has, and the link it has with business strategy.

In the research study, IT Service Management frameworks were studied but the focus was on the ITIL framework. A comprehensive solution for a successful implementation of ITIL was arrived at which would improve the quality of IT service delivery at the NMMU.

Like all management strategies, the philosophy of ITSM is more similar to a journey than a destination. What's more, it is a journey that is never complete. The implementation of ITIL at the NMMU will see huge improvements in the quality of IT service being delivered. The NMMU or any higher education institution must therefore implement ITIL to its full potential and this can only be done with the proper combination of people, processes and technology. The people should have the right skills, appropriate training and the right service culture. The processes should be effectively and efficiently managed. The organization should have a good IT infrastructure in terms of tools and technology.
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Appendix A

ITIL PROCESS MATURITY SURVEY

Page No: 1

IT Service Management is a strategy that addresses the need to automate key IT processes and to provide IT services according to best practices of IT infrastructure management. It is seen as the common link on which the several best practices is based, one of these is the Information Technology Infrastructure Library (ITIL).

IT Managers undertaking adoption of ITIL processes should understand the concept of process maturity. A maturity assessment of existing IT processes helps an Institution understand in clear terms how its processes stack up compared to the best practices for each ITIL process and function. The purpose of this survey is to assess the current level of maturity of your institution’s ITIL Processes. Please note that the study is based on ITIL version 2.

1. Biographical Information

1.1 Institution Name

1.2 * Please indicate your functional level in the IT department:
- Operational
- Management
- Senior Management

1.3 * Please indicate your number of years experience in IT:

2. IT Service Management Frameworks/Standards

To your knowledge, which if any of the following IT Service Management frameworks/standards have been adopted in your Institution? Please select the appropriate option next to the frameworks/standards name.

2.1 ITIL

2.2 Six Sigma

2.3 CobiT

2.4 ISO 17799

2.5 ISO/IEC 20000

2.6 TQM

2.7 MOF
## 2.8 IT Service CMM

<table>
<thead>
<tr>
<th>Adoption Status</th>
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<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully Adopted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partially Adopted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adoption in its early life</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Adopted at all</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 2.9 Other (Specify)

### 3. ITIL Implementation

#### 3.1 Did you consider implementing more than one framework? i.e. CobiT, ISO 17799 and ITIL?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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104
3.2 If multiple frameworks were considered and implemented, please explain why more than one was adopted?

3.3 What was the primary objective of choosing ITIL? Choose one that best suits your institution:

- To align IT Service provision with the business needs
- To ensure better control of the IT Systems Infrastructure
- To ensure cost-justified IT service provision
- To improve the quality of IT service provision
4. Process Implementation

To date, the majority of Organizations adopting ITIL have undertaken only two of its practice areas, Service Support and Service Delivery (ITIL version 2). With 11 Service Management Processes within these 2 areas; please indicate which of the following ITIL Service Processes did you cover in the adoption of ITIL best practice by filling in the order (1-11) of implementation (use only the relevant ones).

<table>
<thead>
<tr>
<th></th>
<th>Service Desk</th>
<th>(value between 1 and 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Incident Management</td>
<td>(value between 1 and 11)</td>
</tr>
<tr>
<td>4.2</td>
<td>Problem Management</td>
<td>(value between 1 and 11)</td>
</tr>
<tr>
<td>4.3</td>
<td>Change Management</td>
<td>(value between 1 and 11)</td>
</tr>
<tr>
<td>4.4</td>
<td>Release Management</td>
<td>(value between 1 and 11)</td>
</tr>
<tr>
<td>4.5</td>
<td>Other? (Please Specify)</td>
<td></td>
</tr>
</tbody>
</table>
4.6 Service Level Management  
(value between 1 and 11)

4.7 Configuration Management  
(value between 1 and 11)

4.8 Availability Management  
(value between 1 and 11)

4.9 Capacity Management  
(value between 1 and 11)

4.10 Financial Management  
(value between 1 and 11)

4.11 IT Service Continuity Management  
(value between 1 and 11)

5. Service Desk

The Service Desk is the primary point of contact for customers and users with the IT department on a day-to-day basis and is crucial in delivering a quality service to the client.

5.1 Please select one or more of the following options that apply to the role of the Service Desk in your Institution:

- Service Desk does not play a role
- Call Logging And Prioritisation
- 1st Line Support
- 2nd Line Support
- Call Closure
- Service Level Tracking - Incident Tracking
- Service Level Escalation - Escalation of Incidents
- User satisfaction survey

6. Configuration Management

Configuration Management is responsible for the Identification, Recording, Tracking and Reporting of key IT components or assets called Configuration Items (CIs). The configuration management database (CMDB) is an important element of ITIL; it allows the Institution to track its CIs and can store historical data for each CI.

6.1 Does your Institution have an integrated CMDB?  
Yes  No  Do not know

6.2 If you answered yes to question 6.1 or certain provision is in place; Is there a better control of IT CIs?  
Yes  No  Do not know

6.3 If you answered yes to question 6.1; Is the value or ROI realized from the CMDB?  
Yes  No  Do not know

6.4 If you answered yes to question 6.1; Is there integration and interfacing to all other processes?  
Yes  No  Do not know

7. Incident Management

Incident Management (IM) is responsible for the detection, classification, recording & initial support of incidents.

7.1 In your opinion, is Incident Management being addressed in your Institution?  
Yes  No  Certain procedures in place  No formal process

7.2 If you answered yes to question 7.1 or certain provision is in place; Is the  
Yes  No  Do not know
7.3 If you answered yes to question 7.1: Are incidents resolved quickly and with minimal impact to the business?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

### 8. Problem Management

Problem Management detects the underlying causes of reported incidents and their subsequent resolution and prevention.

8.1 In your opinion, is Problem Management being addressed in your Institution?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Certain procedures in place</th>
<th>No formal process</th>
</tr>
</thead>
</table>

8.2 If you answered yes to question 8.1 or certain provision is in place, is the same process used to log all problems?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

8.3 If you answered yes to question 8.1; Has the impact of Problems been reduced since the implementation of a formal process?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

8.4 If you answered yes to question 8.1; Has the cost to Users been reduced?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

### 9. Change Management

Change Management is responsible for managing the process of Logging, Assessing, Authorizing, Building, Testing, Scheduling and implementing changes to the IT infrastructure. Any changes made in one part of the system may have an impact on another.

9.1 In your opinion is Change Management being addressed in your Institution?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Certain procedures in place</th>
<th>No formal process</th>
</tr>
</thead>
</table>

9.2 If you answered yes to question 9.1 or certain provision is in place; Is the same process used to log all changes?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

9.3 If you answered yes to question 9.1; Is there a formal process for assessing impact on other services when making changes?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

9.4 If you answered yes to question 9.1; Are all changes reviewed prior to implementation?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

### 10. Release Management

Release Management focuses on facilitating the introduction of software and hardware releases into managed IT environments. These include live production environment and the managed pre-production environments.

10.1 In your opinion is Release Management being addressed in your Institution?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Certain procedures in place</th>
<th>No formal process</th>
</tr>
</thead>
</table>

10.2 If you answered yes to question 10.1 or certain provision is in place; Is the same process used for all Software and Hardware releases?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

10.3 If you answered yes to question 10.1; Is there provision for testing the releases before implementing in the live environment?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
</thead>
</table>

### 11. Service Level Management

Service level management is the process of planning, negotiating, coordinating, monitoring, and reporting on Service Level Agreements.
11.1 | Does your IT department have a formal service-level agreement with the business for IT? | Yes | No
---|---|---|---
11.2 | If you answered yes to question 11.1: Is SLA reporting in place to measure if the SLA is being met? | Yes | No
---|---|---|---
11.3 | If SLA reporting is in place, are you in a position to meet the service levels agreed upon? | Yes | No
---|---|---|---
11.4 | If you answered no to question 11.1: What are the issues that prevent the meeting of the SLAs? | Not enough staff resources | Inadequate Service Desk System | Lack of Skilled IT Staff
---|---|---|---
11.5 | Other: please specify |

12. Availability Management

Availability Management optimizes the availability and reliability of IT resources and of the supporting IT infrastructure by systematically undertaking preventative and corrective maintenance of IT services.

12.1 | In your opinion is Availability Management being addressed in your | Yes | No | Certain procedures in place | No formal process
12.2 If you answered yes to question 12.1 or certain provision is in place; Is availability and reliability of IT services being managed effectively?  
- Yes  
- No  
- Do not know

12.3 If you answered yes to question 12.1; Is availability management cost effective in your environment?  
- Yes  
- No  
- Do not know

13. Capacity Management
Capacity Management helps match IT resources to business demands by ensuring the organization has the appropriate IT capacity to provide the optimum and cost-effective provisioning of IT services.

13.1 In your opinion is Capacity Management being addressed in your Institution?  
- Yes  
- No  
- Certain procedures in place  
- No formal process

13.2 If you answered yes to question 13.1 or certain provision is in place; Is there a budget allocated to monitor and measure capacity?  
- Yes  
- No  
- Do not know

13.3 If you answered yes to question 13.1; Is there an increased ability to demonstrate cost effectiveness?  
- Yes  
- No  
- Do not know

13.4 If you answered yes to question 13.1; Is there a Capacity Management plan that is reviewed regularly with resources allocated accordingly?  
- Yes  
- No  
- Do not know

14. Financial Management
Financial Management helps assess if the IT department is doing the best it can with the money it has by managing costs and helping the organization understand the true cost of providing IT services.

14.1 In your opinion is Financial Management being addressed in your Institution?  
- Yes  
- No  
- Certain procedures in place  
- No formal process

14.2 If you answered yes to question 14.1 or certain provision is in place; Does the business believe the IT financial management process is effective?  
- Yes  
- No  
- Do not know

14.3 If you answered yes to question 14.1; Are customers satisfied with costs and charges of IT services?  
- Yes  
- No  
- Do not know

15. Continuity Management
Continuity Management is concerned with the Institution’s ability to continue to provide a pre-determined and agreed level of IT services to support the minimum business requirements following a service interruption.

15.1 In your opinion is Continuity Management being addressed in your Institution?  
- Yes  
- No  
- Certain procedures in place  
- No formal process

15.2 If you answered yes to question 15.1; Can IT Services be delivered and can they be recovered to meet business objectives?  
- Yes  
- No  
- Do not know

15.3 If you answered yes to question 15.1; Is there awareness throughout the Institution of the Business and IT Continuity Plans?  
- Yes  
- No  
- Do not know

16. Certification
IT staff certification in ITIL.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th>16.1 In your opinion, has it been beneficial to get your IT staff certified in ITIL?</th>
<th></th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>16.2 If the answer is Yes to question 16.1: please explain?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
16.3 If the answer is No to question 16.1; please explain?

17. Adoption

Adoption of ITIL best practice framework.

17.1 In your opinion, overall has the adoption of ITIL best practice framework improved IT service level management in your Institution?

- Improved considerably
- Improved somewhat
- Has remained about the same
- Has declined considerably
- Uncertain

18. Your Institution’s maturity level

Based on how you answered the questions above; please refer to the IT Service Process Maturity Model below which you will use to rate your Institution’s maturity level on a scale of 0 - 5, ranging from 0 (as ‘absence of process’) to 5 (as ‘an optimized process’).

The following descriptions of the ITIL Process Maturity Levels are taken from Pink Elephant ITIL® Process Maturity, 2004. Pg 9:
<table>
<thead>
<tr>
<th>LEVEL</th>
<th>MATURITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absent</td>
<td>There is absolutely no evidence of any activities supporting the process.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There are ad-hoc activities present, but we are not aware of how they relate to each other within a single process. Some policy statements have been made</td>
</tr>
<tr>
<td>1</td>
<td>Initial</td>
<td>- Words but no documented objectives or plans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- No dedicated resources or real commitment</td>
</tr>
<tr>
<td>2</td>
<td>Repeatable</td>
<td>We are aware of the process but some activities are still incomplete or inconsistent; there is no overall measuring or control.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Process driven by tool rather than defined separate from tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Positions are created, but roles and responsibilities are poorly defined</td>
</tr>
<tr>
<td>3</td>
<td>Defined Process</td>
<td>The process is well defined, understood and implemented.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Tasks, responsibilities and authorizations are well defined and communicated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Targets for quality are set and results are measured</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Comprehensive management reports are produced and discussed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Formal planning is done</td>
</tr>
<tr>
<td>4</td>
<td>Managed And Measurable</td>
<td>Inputs from this process come from other well controlled processes; outputs from this process go to other well controlled processes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Tasks, responsibilities and authorizations are well defined and communicated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Targets for quality are set and results are measured</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Comprehensive management reports are produced and discussed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Formal planning is done</td>
</tr>
<tr>
<td>5</td>
<td>Optimized</td>
<td>This process drives quality improvements and new business opportunities beyond the process.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Direct links to IT and corporate policy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Evidence of innovation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Quality management and continuous improvement activities embedded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Performance measurements are indicative of “world class”</td>
</tr>
</tbody>
</table>

18.1 Rate your Institution’s maturity level

| 0 | 1 | 2 | 3 | 4 | 5 |

ITIL PROCESS MATURITY SURVEY
Appendix B

ASAUIDT Questionnaire on ITIL

Background

At the ASAUIDT meeting of 18, 19 March 08, a Special Interest Group for Service Management was created with the task to investigate aspects of Service Management.

Please fill out this questionnaire and send it back to riaan.vanderwalt@nwu.ac.za by 10 September 08.

Questionnaire

1. Did your IT department participate in Tenet’s ITIL project? Select

   If your answer to the previous question was YES, please proceed with question 2.

   If your answer to the previous question was NO, please submit some reasons as to why not? Thank you for your time.

Staff training

2. How many staff from your institution attended the ITIL Foundation training?

3. How many staff passed the Foundation examination?

4. How many staff from your institution attended the ITIL Practitioners training?

5. How many staff passed the Practitioners examination?

6. How many staff from your institution attended the ITIL Managers training?

7. How many staff passed the Managers examination?

8. Is there sufficient time and budget allowed for training of staff? Select

Implemented processes

9. For each of the ITIL processes/functions provide the following information:

   (a) Was this process implemented in your organization?

   (b) Do the IT staff clearly understand this process?

   (c) Is there a regular review of the activities associated with this process?
(d) What electronic tools are used?

(e) Are these tools fully utilised?

<table>
<thead>
<tr>
<th>Process/Function</th>
<th>Implemented</th>
<th>Understanding</th>
<th>Reviews</th>
<th>Tools</th>
<th>Utilisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Desk</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Incident Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Problem Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Configuration Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Change Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Release Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Service Level Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Capacity Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Availability Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Financial Management</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
<tr>
<td>Service Continuity</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td>Select</td>
<td></td>
</tr>
</tbody>
</table>

**Services**

10. Is there a Service Catalogue that describes the services offered by your IT organization? Select

11. Are there Service Level Agreements (SLA) in place that follows a defined structure? Select

12. Are agreements with external suppliers (Underpinning contracts) documented and reflected in the SLAs? Select

13. Have all SLAs been accepted (signed off) by customers/business representatives? Select

14. Is there an adequate Service Improvement Plan (SIP) that can be followed when SLAs are seriously breached? Select

15. Does the SLA structure include features such as reliability, security, service hours, support, response times, turnaround times, performance criteria? Select

16. Are regular service review meetings held to discuss current and future requirements of the IT organization? Select

**Benefits**

List the benefits applicable to your audience:

*Example:*  

<table>
<thead>
<tr>
<th>Audience</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>Cost savings</td>
</tr>
<tr>
<td>User</td>
<td>Improved relationships</td>
</tr>
<tr>
<td></td>
<td>Improved service</td>
</tr>
</tbody>
</table>
Better understanding of the level of service to be provided

<table>
<thead>
<tr>
<th>Audience (Stakeholder)</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td></td>
</tr>
<tr>
<td>User</td>
<td></td>
</tr>
<tr>
<td>IT organization</td>
<td></td>
</tr>
</tbody>
</table>

Your participation will be greatly appreciated.

Riaan van der Walt
Convenor SIG SM

Original details: ALDINE.OOSTHUYZEN@NWU.AC.ZA
p:\vdkadmin\2008\servicemanagement\asaudit questionnaire on itil.doc