CHALLENGES AND CRITICAL SUCCESS FACTORS IN IMPLEMENTING ITIL SERVICE OPERATION PROCESSES: THE CASE OF COMMERCIAL BANK OF ETHIOPIA

A Thesis Submitted to College of Business and Economics of Addis Ababa University in Partial Fulfilment of the Requirement for the Master of Art in Business Administration (MBA)

By: Rahel Teklay

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS & ECONOMICS

MBA PROGRAM

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Statement of Declaration

I declare that this thesis is my original work and has not been submitted for any degree in any other university. I have undertaken the study independently with the guidance and support of the research advisor.

Signature: _____

Rahel Teklay

This thesis has been submitted for examination with my approval as university advisor.

Signature: _____

Jemal Mohammed (PhD)

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

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This is to certify that the thesis entitled, "Challenges and Critical Success Factors in Implementing ITIL Service Operation Processes: The Case of Commercial Bank of Ethiopia" was carried out by Rahel Teklay Weldemehret under the supervision of Jemal Mohammed (PhD), submitted in partial fulfilment of the requirement for the Master of Art in Business Administration (MBA) complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

Approved by board of examiners:

Name	Title	Signature	Date
Jemal Mohammed (PhD)	**Advisor**	_____	_____
Mesfin Werkineh (PhD)	**External Examiner**	_____	_____
Mesfin Fikre (PhD)	**Internal Examiner**	_____	_____

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List of acronyms

CBE	Commercial Bank of Ethiopia
CMDB	Configuration Management Database
CMMI	Capability Maturity Model Integration
COBIT	Control Objective for Information and related Technology
CSF	Critical Success Factor
CSI	Continual Service Improvement
DavOps	Development and Operations
DMADV	Define, Measure, Analyze, Design, Verify
DMAIC	Define, Measure, Analyze, Improve, Control
EA	Enterprise Architecture
IT	Information Technology
ITIL	IT Infrastructure Library
ITSM	IT Service Management
PDCA	Plan-Do-Check- Act
SLA	Service Level Agreements
SPC	statistical process control
SPOC	Single Point of Contact
TOGAF	The Open Group Architecture Framework
TQM	Total Quality Management

Abstract

Information Technology Infrastructure Library (ITIL) is the most popular framework for IT Service Management (ITSM) in the world. This framework is also in the process of being adopted by Ethiopian IT organizations. ITIL comprises of five service lifecycle stages. Each lifecycle stage includes guidance on service management of 26 processes. Service Operation (SO) lifecycle stage is a critical stage of the service lifecycle responsible for the ongoing management of the technology that is used to deliver and support services. Available literature on ITIL discusses the importance of ITIL SO processes and its benefits. Lack of academic researches published on standard approach on its implementation in developing countries like Ethiopia generally, and the banking sector in particular, has contributed to the decision to carry out this study. Therefore, the purpose of this study was to explore Critical success factors (CSFs), identify challenges and discover the possible ways by which the IT support organizations can overcome the identified challenges of ITIL SO implementation in the context of Commercial Bank of Ethiopia. For this purpose, an exploratory case study approach was applied. Primary and secondary data were collected via semi-structured interview, document collection, and direct observation. For the reason that involving knowledgeable individuals on the subject of the study was crucial, a purposive sampling technique was used in the research. Respondents were screened by their exposure and certification level of ITIL framework. Data was analyzed and interpreted using qualitative content analysis method. The extracted challenges and CSFs from the literature and semi-structured interview were analyzed. As a result, findings which were unique to this study identified and a SO processes implementation strategy to overcome the identified challenges proposed. Thus, this paper identified 19 challenges in five categories. On the other hand, the critical factors that are unique to this study are: Project budget, Top Management involvement, Stakeholder management, Prioritization of Process implementation, ITIL Implementation experience, Organizational structure, Organizational culture, IT Governance, Measurement of stakeholder capabilities, Project management skill, activity demarcated among support levels, Process integration, maturity of other processes.

Key words: *ITSM, ITIL, Challenges, Implementation, Critical Success Factors, Service Operation*

Chapter One: Introduction

1.1. Background

In today's very competitive business environment, the effective and innovative use of Information Technology (IT) has a positive impact on organizational performance and will positively influence the transformational business (Fasihi, 2015). In response to global competitive pressure, service firms are searching for ways to deliver more cost-effective, high quality IT service, including the principles of total quality management and IT infrastructure library (Shang & Lin, 2010).

According to Vaitha and Francis (2016), Information Technology Service Management (ITSM) can be referred to as the way of operating the IT part of the organization by focusing on the day to day services provided by the IT department in that organization, so as to meet customer's needs. Over 45% of companies of the world are estimated to use IT Service Management (ITSM) frameworks (Marrone & Kolbe, 2011).

Information Technology Infrastructure Library (ITIL) is set of best-practice publications for IT service management. ITIL gives guidance on the provision of quality IT services and the processes, functions and other capabilities needed to support them (OGCa, 2011). Many organizations are implementing ITIL to improve their IT service management.

Nowadays IT services have become strategic asset in the banking environment; continuous availability of these services is one of the undisputed factors that enable a bank to remain leader in the banking industry. IT managers in IT departments must prove to their senior management their ability to reengineer historically silo based IT functions into value based and end to end process based service provider; ITIL processes were then prescribed by IT and business process consultants as a tool for effective and efficient ITSM (Mohammed, 2018).

Commercial Bank of Ethiopia is one of the largest financial companies in Ethiopia with a vision of becoming world-class commercial bank by the year 2025 (Commercial Bank of Ethiopia 2019). In the pursuit of becoming a world-class commercial bank, Information Technology (IT) has been massively implemented in CBE as a medium for improving competitiveness and to take

a role in encouraging the accomplishment of mission, vision, and objectives of the bank. Service delivery has been described to be one of key performance indicators of an organization (Adewoye, 2013). Therefore, handling the IT Operation activities is an IT service management and evaluation activity that must be done by the bank. Because, these activities are used to control the business sustainability and help perform attempts of betterment. Consequently, ITIL framework has been selected by the bank to address the IT service delivery challenges and the observed weaknesses. Accordingly, the bank has been implementing the framework since May 17, 2017.

1.2. Statement of the Problem

ITIL framework is based on the five stages of the service lifecycle; Service Strategy, Service Design, Service Transition, Service Operation and Continual Service Improvement (OGCa, 2011). Service Operation is the phase in the ITIL Service Management Lifecycle that is responsible for business as usual activities. Service Operation can be viewed as the factory of IT. This implies a closer focus on the day-to-day activities and infrastructure that are used to deliver services (OGCa, 2011).The practices like ITIL are used to help organizations to implement an efficient framework for IT service Management, so that firms' resources are maximized and information service quality and customer satisfaction are improved (Shang & Lin, 2010). Although the ITIL guidelines are considered crucial to the implementation process, it appears there is no standard implementation approach taken by organizations (Cater-Steel & Pollard, 2008).

ITIL implementation is not well spelled out in the ITIL publications and therefore can be very challenging (Ahmad & Shamsudin, 2013). ITIL framework only provides recommendations, and companies need to utilize this framework to improve their IT service support processes and establish best practices (Valverde, Saade, & Talla, 2014). Since the ITIL publications do not prescribe how to adopt, adapt or implement the guidelines as part of a service management strategy, it is useful to explore different implementation strategies organizations are employing in their adoption of ITIL (Polland & Cater-Steel, 2009).

The concept of critical success factors (CSFs) is an Information Systems project management and planning approach where CSFs are defined as the few key areas of the project where things must go right for the project to succeed, and if they are not accomplished well, it is unlikely that the project's objectives will be attained (Polland& Cater-Steel, 2009). Though ITSM projects can bring competitive advantage to organizations, the high failure rate in implementing such projects is a major concern. Without doubt, exploring the CSFs of ITSM implementation will facilitate enterprises to better utilize their resources and dramatically increase the success likelihood of its implementation (Zang, Zhang, & Chen, 2013).

In Ethiopia, companies like Ethio-telecom have already implemented ITIL (Alemeye, 2015). Alemye (2015) has explored influencing factors to the implementation of ITIL based ITSM in Telecom companies taking Ethio-telecom as a case. He has identified barriers which were common to most ITIL implementation processes and barriers which were typical to his study which are complexity of integrating ITIL to the existing system, and composition of the ITIL implementation team members. Besides, his study identified eight critical success factors. Moreover, ITIL aligned organizational structure was identified as a unique or typical critical success factor in his study.

IT organizations adopt ITIL in different ways possibly due to cultural, Political or economic factors (Tadesse, 2017). In commercial Bank of Ethiopia, ITIL Service Operation lifecycle is one of the fully adapted and implemented lifecycle stages. With regard to disclosing influencing factors to the implementation of ITSM frameworks an attempt or minimal works have been done in some developed countries, but there is scarcity of such researches in developing countries in general and in Ethiopia in particular (Alemeye, 2015). Lack of academic researches published on standard approach of the implementation of ITIL in the Ethiopia generally, and the banking sector in particular, has contributed to the decision to carry out this study. The purpose of this study was therefore to conduct a rigorous investigation that would lead to the identification of the challenges associated with ITIL Service operation processes implementation and discover the possible ways, methods and approaches by which the IT support of commercial Bank of Ethiopia can overcome the identified challenges. The study also identified critical success factors (CSF) associated with ITIL Service Operation Processes implementation in Commercial Bank of Ethiopia context.

In light of the above, this study aims to explore the following research questions:

- What are the challenges associated with the implementation of the ITIL service operation processes by IT service provider in the context of Commercial Bank of Ethiopia?
- How can the IT service provider in commercial Bank of Ethiopia overcome these challenges?
- What are the critical factors for successful implementation of ITIL Service Operation in the context of Commercial Bank of Ethiopia*?*

1.3. Objectives of the Study

The objectives of the research are:

1. Identify the challenges of implementing the ITIL Service Operation Processes within IT service provider in the context of CBE,

2. Discover the possible ways, methods and approaches by which the IT support organizations can overcome the identified challenges in the context of CBE,

3. Discover the Critical Success Factors for the implementation of ITIL service operation in the context of CBE.

1.4. Significance of the Study

This research adds to academic literature on the ITIL Service operation processes and its implementation. It benefits IT support organizations and IT Service Management practitioners; the challenges identified by this research can be used as a priority list as they plan to implement the ITIL service operation processes and improve their IT services. This research also offers guidance for implementing the ITIL Service Operation Processes. Similarly, the study will explore the critical success factors to the implementation of ITIL Service operation in CBE.

1.5. Scope of the study

The scope of this study was limited to assess the challenges and Critical Success Factors of implementing IT service operation processes only (Incident Management process, Problem Management Process, Service Request Fulfilment Process, Event Management Process and Access Management Process) in commercial Bank of Ethiopia. In addition to the head office Information Systems departments, it considered two regional district IT supports of CBE located in Addis Ababa.

1.6. Organization of the thesis

The research has five chapters as shown in table 1.

Table 1 Structure of the Thesis

Chapters	Contents and Organizations
Chapter One: Introduction	This chapter contains background of the study, statement of the problem, basic research questions, objectives of the study, definition of terms, significance of the study, scope of the study, and organization of the thesis.
Chapter Two: Literature Review	The related literatures on ITSM, IT Governance, Quality Management, Enterprise Architecture, ITIL, ITIL implementation, ITIL Service Operation Processes, and IT services are reviewed on this chapter.
Chapter Three: Research Methodology	Under this chapter, type and design of the research, the research approach; the sources of data; the data collection tools employed; the procedures of data collection; and the methods of data analysis used are described.
Chapter Four: Research findings	This chapter summarizes the results of the study, and interpret and discuss the findings.
Chapter five: Discussion, Conclusions and Recommendations	This chapter comprises sections including Discussion, Conclusions, as well as future research and recommendations. Conclusions are drawn from the summary of findings .In addition recommendations are put with any limitations that could have effect on the conclusions specified.

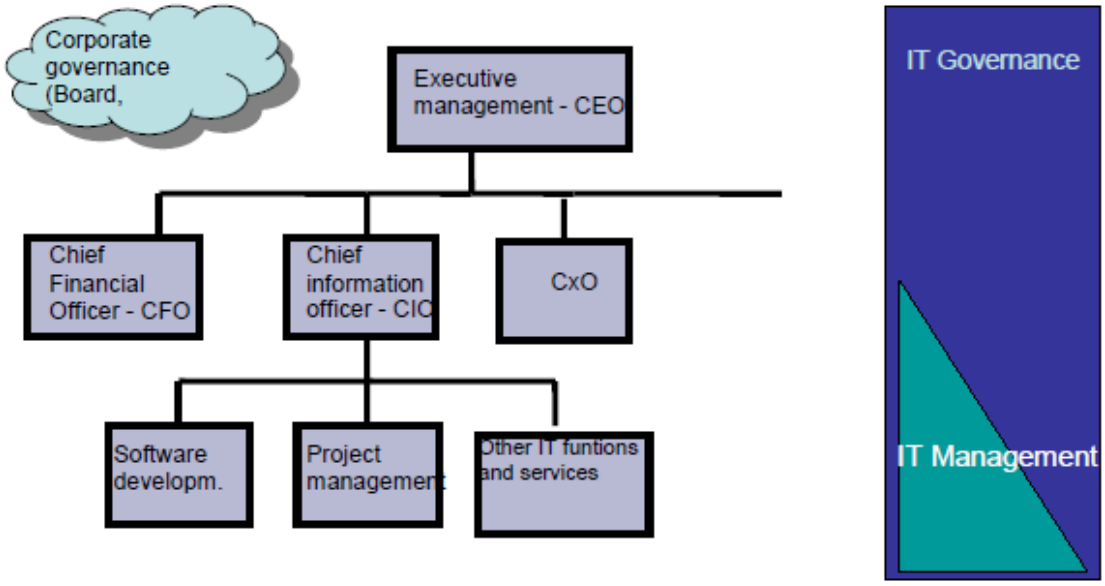
Chapter Two: Literature Review

This chapter encompasses a brief introduction of ITSM and related frameworks, and then the most related researches in the field are introduced. The purpose of the literature review is to understand concepts, theories, and current knowledge on ITSM and related frameworks such as; IT Governance, Enterprise architecture, Quality Management and ITSM processes in general and ITIL Framework in particular including but not limited to the ITIL adoption benefits, challenges and critical influencing factors of ITIL implementation.

2.1. IT Governance

Usman (2019) defined IT governance as the combined efforts of executive management and IT management put in place to harness IT strategy with the objectives of the organization in creating business value. The focus of IT management is addressing the daily management needed to run an IT organization but the center of attention of IT governance is on the strategic decisions needed to ensure IT can be run in accordance with business needs, rather than addressing the daily management needed to run an IT organization (Temesgen, 2017; Winniford, Conger, & Erickson-Harris, 2009; Spremic, 2009). Spremic (2009) added, IT governance closely relates to corporate governance, the structure of the IT organization and its objectives and alignment to the business objectives. This in particular means that executive management members and corporate governance organizations bodies need to take responsibility for governing IT, which makes IT Governance a key executive function.

Figure 1 Differences between IT Governance and IT Management concepts *Source*: adopted from Spremic (2009)



According to Tadesse (2017), IT Governance is not a one-time exercise or something achieved by a mandate or setting of rules rather requires a commitment from the top of the organization to instill a better way of dealing with the management and control of IT.

2.1.1. COBIT

Developed by ISACA (Information System Audit and Control Association) and ITGI (IT Governance Institute), COBIT (Control Objective for Information and related Technology) is the widely accepted IT governance framework organized by key IT control objectives, which are broken into detailed IT controls (Spremic, 2009; Tagel, 2016). The objective of COBIT is to research, develop, publicize and promote an authoritative, up-to date, international set of generally accepted information technology control objectives for day-to-day use by business managers and auditors (Sheikhpour & Modiri, 2012). According to Temesgen (2017), COBIT emphasizes regulatory compliance, helps organizations to increase the value attained from IT, enables alignment and simplifies and implementation of the COBIT framework. It produces valuable control objectives that protect the company against wasting money on Information Technology.

COBIT becomes a unique and integrated repository, designed to help companies from the CEO to the CIOs through the business departments to achieve their objectives of governance and IT management. The processes and good practices of COBIT are the result of a consensus of international experts, but also of many experiences. COBIT is constantly updated and harmonized with most other standards such as ITIL, CMMI, TOGAF, etc. Since its first version released in 1996 COBIT has evolved, version 5 appeared in 2012 (Motii & Semma, 2017). The new edition of COBIT is called COBIT 2019 (Lainhart, 2018). COBIT 2019 framework is intended to give organizations greater adaptability while customizing an IT governance procedure ("The Evolution of COBIT® 2019 from COBIT® 5", 2019).

2.2. Enterprise Architecture

Enterprise Architecture is a management and technology practice that is devoted to improving the performance of enterprises by enabling them to see themselves in terms of a holistic and integrated view of their strategic direction, business practices, information flows, and technology resources. By developing current and future versions of this integrated view, an enterprise can manage the transition from current to future operating states (Bernard, 2012). The purpose of EA is to enable the Enterprise to most effectively achieve the mission, business strategy, and goals through cycles of planning, design, deployment, and delivery of change. An architected approach provides a rigorous planning methodology that validates the business objectives, ensuring that they are feasible, deliver the desired business value, and their achievement is cost-effective (Hornford et al., 2017; Lewam, 2018).

Cameron and McMillan (2013) describe Enterprise Architecture Framework (EAF) as it comprises a set of models, principles, and methods that are used to implement EA. The framework provides a means to communicate information about architectural artifacts, their relationships to each other, and to their stakeholders using a common vocabulary.

According to Qurratuaini (2017), the four most widely used enterprise architecture frameworks in the industry today are Zachman Framework, Gartner Framework, Federal Enterprise Architecture (FEA), and The Open Group Architecture Framework (TOGAF). TOGAF framework is considered as far superior compared to other enterprise architecture frameworks (Cameron & McMillan, 2013).

2.2.1. TOGAF

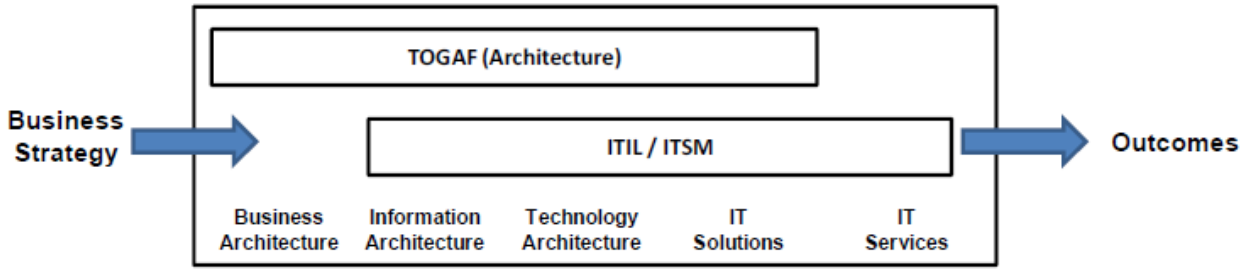
The Open Group Architecture Framework (TOGAF), which defines a framework for the design, planning, implementation and governance of an enterprise. TOGAF defines the structure of components in the organization, their relationships with one another and the principles and guidelines governing their design and evolution (OGCa, 2011; Thorn, 2007; Gotze & Graves, 2012). TOGAF is considered as being the most popular open EA framework (Gotze & Graves, 2012).

According to Gotze & Graves (2012) TOGAF is based on four pillars, called architecture domains:

- **Business Architecture** or business process architecture which defines the business strategy, governance, organization, and key business processes of the organization
- **Applications Architecture** which provides a blueprint for the individual application systems to be deployed, the interactions between the application systems, and their relationships to the core business processes of the organization with the frameworks for services to be exposed as business functions for integration
- **Data Architecture** which describes the structure of an organization's logical and physical data assets and the associated data management resources
- **Technology Architecture** or technical architecture which describes the hardware, software, and network infrastructure needed to support the deployment of core, mission-critical applications

However, in TOGAF 9.x documentation, the Applications Architecture and Data Architecture are part of the TOGAF Information Systems Architecture domain.

Figure 2 Scope of ITIL and TOGAF *source*: adopted from Gotze & Graves (2012)



2.3. Quality Management

Quality has been misunderstood to refer, variously, to luxury goods for the super-rich, to excellence in the name and achievement, to products of distinctive design and style, to special services, to the intricate workmanship of the master craftsman (Daniel & Fasika, 2003). According to Firehiwot (2018), there is no common definition about quality, different scholar defined quality differently. A narrow definition of quality is referred to product quality. However, broadly defined quality includes working quality, service quality, information quality, and process quality. Service quality differs from product quality for the reason that service quality is an elusive and abstract that is difficult to define and measure. As service products tend to have certain features such as intangibility, inseparability, variability, perish-ability, it is different from tangible products (Shang & Lin, 2010).

ISO/FDIS 9000:2015 defines the quality of an organization's product and service is determined by the ability to satisfy customers and the intended and unintended impact on relevant interested parties. Higher product quality is required for a company to become more competitive, both locally and in international trade. Improved quality at the enterprise level lowers its cost of operations' and increases its productivity (Daniel & Fasika, 2003). Shang & Lin (2010) states that, closing the gap between services provided and customer's perception on service quality is crucial to customer satisfaction. All in all, organizations need to take into consideration of customers' perception when setting service quality measurements, since service quality encompasses both expected standards and perceived standards.

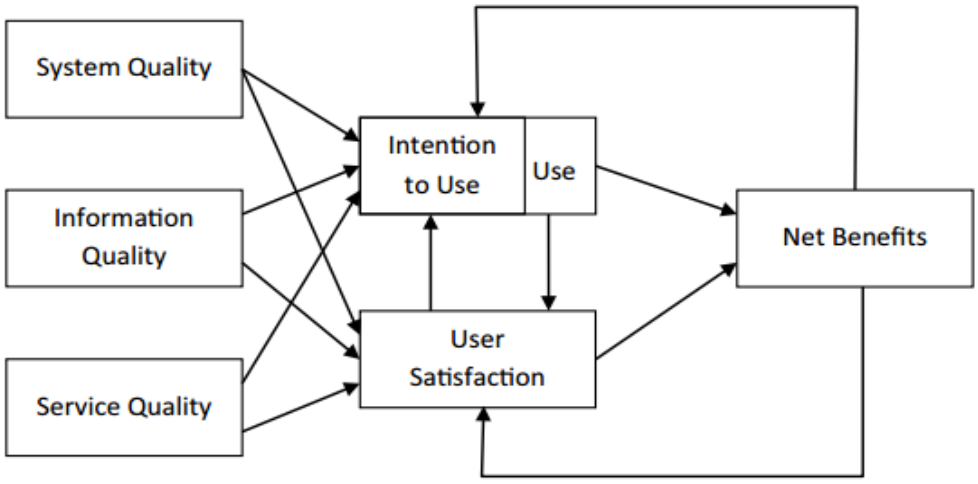
Quality management focuses on product or service quality as well as the quality assurance and control of processes to achieve consistent quality. Total Quality Management (TQM) is a methodology for managing continual improvement by using a quality management system. TQM establishes a culture involving all people in the organization in a process of continual monitoring and improvement (OGCa, 2011). Ultimately quality management seeks to create prosperity through human endeavor. It is a form of business management committed to customer satisfaction through continuous improvement. Since business culture varies from country to country and from company to company, there is no set standard form of a good quality management program. Each single program must be planned and implemented on the basis of the nature of its activities and environment (Daniel & Fasika, 2003). ISO9000:2005 as cited in OGCe (2011), states the fundamentals of quality management systems that are applicable to all organizations which need to demonstrate their ability to consistently provide products that meet customer and applicable statutory and regulatory requirements. ISO 9001:2008 specifies generic requirements for a quality management system.

OGCe (2011) also describes Six Sigma as a data-driven process improvement approach that supports continual improvement. The objective is to implement a measurement-oriented strategy focused on process improvement and defects reduction. A Six Sigma defect is defined as anything outside customer specifications. Six Sigma focuses on dramatically reducing process variation using statistical process control (SPC) measures. There are two primary sub-methodologies within Six Sigma: DMAIC (Define, Measure, Analyze, Improve, Control) and DMADV (Define, Measure, Analyze, Design, Verify). DMAIC is an improvement method for existing processes for which performance does not meet expectations, or for which incremental improvements are desired. DMADV focuses on the creation of new processes.

According to DeLone & McLean (2016), early attempts to define information system success were ill-defined due to the complex, interdependent, and multi-dimensional nature of IS success. To address this problem, William DeLone and Ephraim McLean, performed a review of the research published during the period 1981–1990 and created a taxonomy of IS success and identified six interdependent dimensions of IS success measurement: System Quality (technical level); Information Quality (semantic level); and Use, User Satisfaction, Individual Impact, and

Organizational Impact (influence level). Based upon these six measures, the DeLone & McLean devised the DeLone and McLean IS Success Model, referred to as the D&M Model. However, other researchers have suggested that the variable "Service Quality" be added to the D&M Model which measures the Service Quality of information technology organizations, as opposed to individual IT applications, by measuring and comparing user expectations and their perceptions of the effectiveness of the information technology organization. "This concept of IS Service Quality is similar to the widely used ITIL [Information Technology Infrastructure Library, 1989] methodology for IT Service Management and its measures of IT Service Value" (DeLone & McLean,2016, p.14).

Figure 3 Updated DeLone and McLean IS Success Model *source*: adopted from DeLone & McLean (2016),



2.4. Information Technology Service

Prior to discussion about challenges and critical success factors of ITIL implementation, it is logical first to know or understand what services, IT services and ITSM are.

Peppard (2003) defines a service as something that is not manufacturing. Software Engineering Institute defined a service as a way of delivering value to customers, while facilitating the achievement of the results they want to obtain without having to deal with unnecessary and risky costs (SEI, 2010).

The Information Technology (IT) departments in many organizations were previously focused on the production of software applications, and in the late 1980s it started to change to a service mode of operation. For IT Service Management (ITSM), the main focus is not on the development of IT applications, but rather on the management of IT services (Marrone & Kolbe, 2010). Peppard (2003) described IT service as a concept that has come to mean the services that are necessary to keep the computer systems running. On the other hand, Diirr & Santos (2014) defined Information Technology (IT) service is a set of IT or none-IT resources perceived by the client as whole and maintained by an IT service provider. For the purpose of this study the definition given for services and IT services by Office of Government Commerce (OGC) is used. OGCa (2011) defines Services as *"A means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks".* It also defines IT service: "*A service provided by an IT service provider. IT service is made up of a combination of information technology, people and processes"* **(**OGCa, 2011, p.226).

As stated in OGCa (2011), Customer of an IT Service Provider is the person or group that defines and agrees the Service Level Targets. Customers can be distinguished as internal customers who work for the same business as the IT service provider and external customers who work for a different business from the IT service provider. External customers typically purchase services from the service provider by means of a legally binding contract or agreement.

With a service-centric view, IT support organizations are increasingly seen as service providers rather than technology providers (Hsu, 2011). In the 1990s, enterprise-wide applications such as enterprise resource planning (ERP), budding Internet applications, and outages affecting whole

organizations, sometimes for days, drove the growth of service management. The concept of services and service management then grew out of the increasing complexity of IT systems and the growing maturity of IT management (Winniford, Conger, & Erickson-Harris, 2009).

2.4.1. Information Technology Service Management (ITSM)

According to Mohammed (2018), ITSM is concerned with the delivery and support of IT services to all business functions in the organization with the main focus on the continuous improvement of the quality of IT services and costs rationalization through performance measurement indicators. ITSM provides processes, frameworks, methodologies and guidance to manage planning, implementation and assessment of IT service processes to optimize tactical and strategic IT operations-related activities. ITIL (Information Technology Infrastructure Library), CMMI and ISO/IEC 20000 are some of the most internationally accepted ITSM frameworks and standards (Mesquida, Mas, Amengual, & Calvo-Manzano, 2011). According to Vaitha & Francis (2016), Implementation of ITSM brings about changes in the organizational culture. Polland & Cater-Steel (2009) discussed as ITSM provides real benefits by helping IT organizations become more adaptive, flexible, cost effective, and service oriented. ITSM drives fundamental change within the IT organization, including how it manages its processes, technology assets, vendors and deploys personnel, and how IT staff view their organizational roles.

2.4.1.1. ISO/IEC 20000

International Organization for Standardization (ISO) and International Electro-technical Commission (IEC) usually called ISO 20000 is an IT service management standard (Diirr& Santos, 2014). It is the world's first standard for IT service management (Mohammadi, Ravasan, & Hamidi, 2015). The standard specifies a set of inter-related management processes, and is based heavily upon the ITIL framework (Tadesse, 2017).

Vaitha & Francis (2016) highlighted that, ISO/IEC 20000 focus to improve the way IT services are delivered by providing best methods to be used for service management. ISO/IEC 20000 and ITIL are very compatible, even though their approaches are different. "An organization comfortable with ITIL will find no difficulty in interpreting ISO/IEC 20000" (OGCa, 2011,

p.137). One of the most common routes for an organization to achieve the requirements of ISO/IEC 20000 is by adopting ITIL best practices (OGCa, 2011).

2.4.1.2. CMMI

Capability Maturity Model Integration (CMMI) process improvement method was developed by the Software Engineering Institute (SEI) of Carnegie Mellon University (Mohammadi et al., 2015).

According to CMMI Institute (n.d.), there are different CMMI models that serve different purposes.

- CMMI for Development (CMMI-DEV) is used to improve engineering and development processes in an organization that develops products.
- CMMI for Acquisition (CMMI-ACQ) is used to improve supplier management processes in an organization that deals with multiple suppliers for its business.
- The People CMM (PCMM) is used to improve workforce management in any organization.
- The Data Management Maturity (DMM) model is for the management of an organization's data assets and corresponding activities.
- Capability Maturity Model for Services (CMMI-SVC) is used to improve management and service delivery processes in an organization that develops, manages, and delivers services.

CMMI-SVC is a maturity model that focuses on companies supplying services and covers required activities for establishing, delivering, and managing services (Diirr& Santos, 2014). CMMI provides both a staged and a continuous model (Mohammadi et al., 2015). In the continuous representation, improvement is measured using capability levels. Maturity is measured for a particular process across an organization. In the staged representation, improvement is measured using maturity levels, for a set of processes across an organization. SEI (2010) states the capability levels as: (Level 0) incomplete, (Level 1) executed, (Level 2) managed, and (Level 3) defined. Moreover, the maturity levels as: (Level 1) initial, (Level 2) managed, (Level 3) defined, (Level 4) quantitatively managed, and (Level 5) optimizing.

On the other hand, Marrone & Kolbe (2010) reviewed the Maturity Model presented on other studies. This Maturity model is based on the model from COBIT and Capability Maturity Model Integration (CMMI). These levels are intended as profiles of IT processes, and companies would identify these levels as a description of their current state. The model is divided in levels which range from non-existent (0) to optimized (5). At non-existent (Level 0), the lowest level (0) of the maturity model, the management processes are not applied at all. At the following level (1), named Initial, processes are ad hoc and disorganized. Level 2 is referred to as repeatable, where the processes follow a standard, are documented and understood. Level 3 is where processes are documented and monitored for compliance. This level is known as defined. Level 4, known as managed, is one where management monitors and measures according to metrics established in the previous level. The highest level of maturity is known as optimized; this is where good practices are followed and automated.

2.4.1.3. ITIL

Originally developed by the British government in the late 1980s, ITIL is comprised of a growing series of publications that outline a process-based set of best practices for IT service management (Kundler, 2005). ITIL serves as a roadmap for process improvement to help IT professionals build a foundation for ongoing service excellence while meeting budget and regulatory requirements (Polland & Cater-Steel, 2009). ITIL best practices are applicable to all IT organizations, no matter what their size or what technology they use (Kundler, 2005).

At present ITIL is the most widely accepted approach to IT Service Management in the world (Sharifi et al., 2008**;** Kundler, 2005).

ITIL and COBIT

COBIT and ITIL are not competitive, nor are they mutually exclusive. On the contrary, they can be used in conjunction as part of an organization's overall governance and management framework (OGCa, 2011). COBIT is positioned at a high level, is driven by business requirements, covers the full range of IT activities, and concentrates on *what* should be achieved rather than *how* to achieve effective governance, management and control. ITIL provides an organization with best-practice guidance on *how* to manage and improve its processes to deliver high-quality, cost-effective IT services.

ITIL and COBIT complement each other and if used together, they contribute to a higher value (Vaitha and Francis, 2016). They complement each other such that ITIL is focused on 'how' to overcome the challenges while COBIT is focused on 'what' needs to be done to overcome the challenges.

Table 2 Differences between ITIL and COBIT *Source*: adopted from Vaitha and Francis (2016)

ITIL	**COBIT**
Focused on the operation management by provision of best practices and principles.	Focused on IT governance by defining, implementing, measuring and improving definite processes involved with IT life cycle.
Improvement of effectiveness and quality of IT customer service and IT operations.	Improvement of the IT governance in terms of qualitative and quantitative basis.
Focused on HOW to meet the challenge.	Focused on WHY to meet the challenge.
Focused more on ITSM by using five (5) stages of service life-cycle (service strategy, service design, service transition, service operation and continual service improvement).	Based on five principles (meet stakeholder needs, single integrated framework, holistic approach, governance and management separation and end to end cover of enterprise).

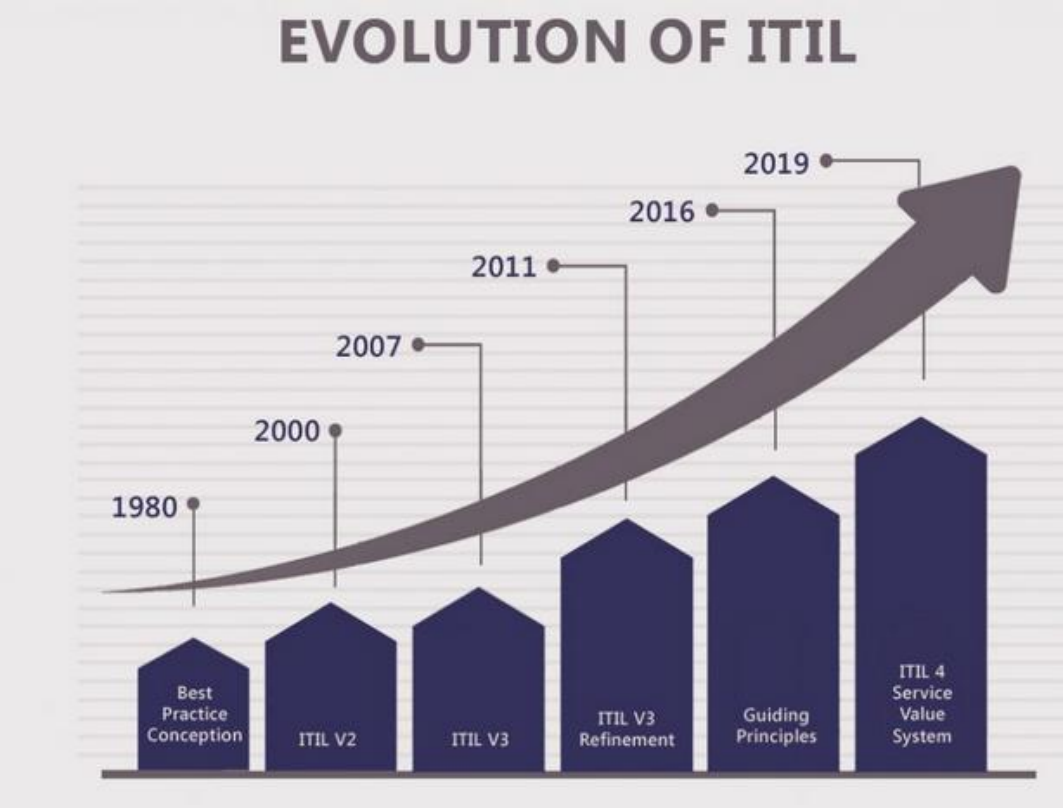
Evolution of ITIL

ITIL Version 1 was initially developed in the 1980s as a library of several books, with each one describing a process, and it was used mainly by British Government agencies over the next decade (Joret, 2019). This initial version of ITIL consisted of a library of 31 associated books covering all aspects of IT service provision. Subsequently, ITIL V2 was published as a set of revised books between 2000 and 2004 consisting seven more closely connected and consistent books consolidated within an overall framework (itSMF, 2011).

The natural progression of best practices and the need to streamline and improve the value for money of IT services led to the creation of ITIL Version 3 (Joret, 2019). ITIL Version 3 was published in consisting of five core publications covering the service lifecycle (itSMF, 2011). Two editions were released, one in 2007 and another in 2011 (Joret, 2019). These provided ways

to manage the end-to-end lifecycle of services with 26 processes and supported by four organizational functions. This was followed in 2016 by the publication of ITIL Practitioner, which introduced guiding principles to facilitate the adoption of ITIL. The latest iteration of the framework is ITIL 4. Launched in 2019, ITIL 4 has evolved from the previous version by re-shaping much of the established ITSM practices in the wider context of customer experience, value streams and digital transformation, as well as embracing new ways of working, such as Lean, Agile, and DevOps.“ITIL V3 was simply referred as ITIL” (OGCa, 2011, p.16). Therefore, the subject of this study specifically is referred to ITIL Version 3 what we call ITIL henceforth.

Figure 4 Evolution of ITIL *Source*: adopted from Lele (2019)



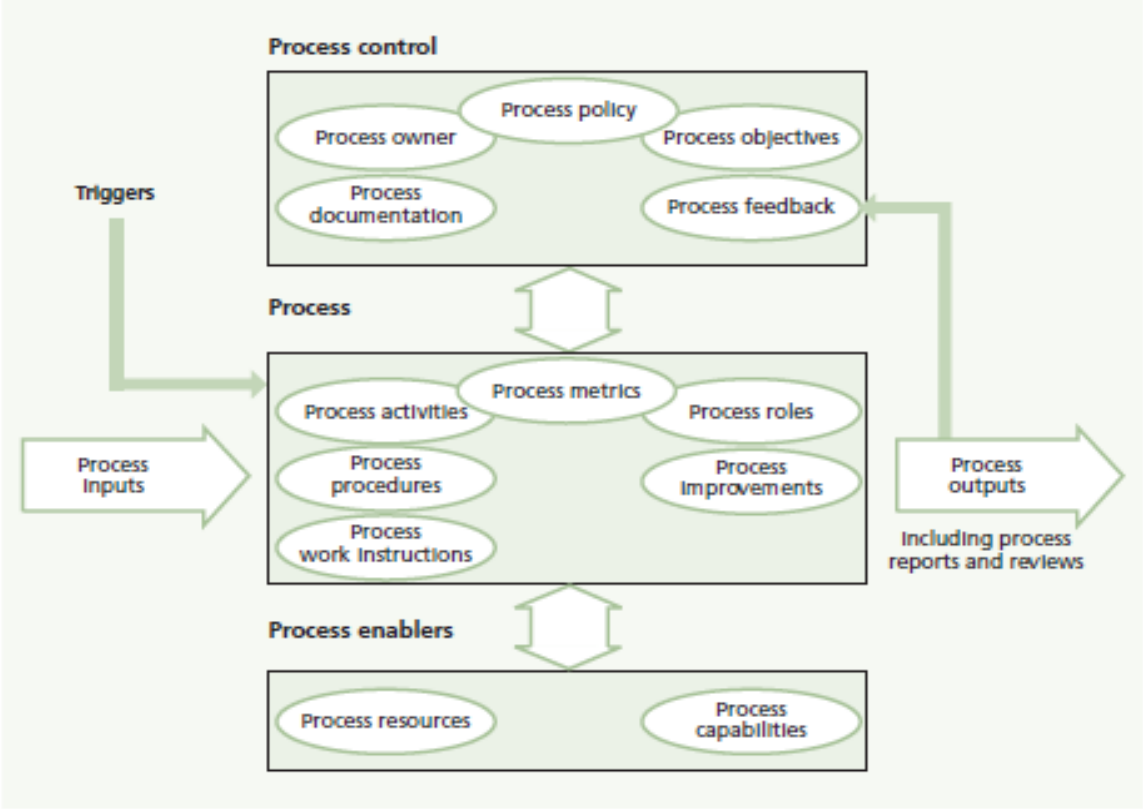
Service Life Cycle of ITIL V3 Framework

The ITIL framework is based on the five stages of the service lifecycle. A key principle within ITIL and across the service lifecycle stages are alignment of IT with the business it supports.

That means, all service solutions and delivery should be driven by business needs and requirements, while reflecting the strategies and policies of the service provider organization (Alemeye, 2015). The five service lifecycle stages are: Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement (OGCa, 2011).

ITIL provides guidance to service providers on the provision of quality IT services, and on the processes, functions and other capabilities needed to support them. Each ITIL service lifecycle stage includes guidance on service management processes as shown in Table 3. OGCa (2011) defines a process is a structured set of activities designed to accomplish a specific objective. A process takes one or more defined inputs and turns them into defined outputs. Processes define actions, dependencies and sequence. Well-defined processes can improve productivity within and across organizations and functions.

Figure 5 Process Model *Source*: adopted from (OGCa, 2011, p.34)



A process may include any of the roles, responsibilities, tools and management controls required to deliver the outputs reliably. A process may define policies, standards, guidelines, activities and work instructions if they are needed. Processes, once defined, should be documented and

controlled. Once under control, they can be repeated and managed. Process measurement and metrics can be built into the process to control and improve the process as illustrated in Figure 4. For the service lifecycle to be successful, an organization will need to clearly define the roles and responsibilities required to undertake the processes and activities involved in each lifecycle stage. These roles will need to be assigned to individuals, and an appropriate organization structure of functions will need to be established and managed. "A function is a team or group of people and the tools or other resources they use to carry out one or more processes or activities" (OGCa, 2011, p.35).

Service Strategy

ITIL Service Strategy provides guidance for the service strategy stage of the ITIL service lifecycle. Its purpose is to define the perspective, position, plans and patterns that a service provider needs to be able to execute to meet an organization's business outcomes. There are five processes in this lifecycle stage namely Strategy management for IT services, Service portfolio management, Financial management for IT services, Demand management, and Business relationship management (OGCa, 2011).

Service Design

ITIL Service Design provides guidance for the service design stage of the ITIL service lifecycle. The purpose of the service design stage of the lifecycle is to design IT services, together with the governing IT practices, processes and policies, to realize the service provider's strategy and to facilitate the introduction of these services into supported environments ensuring quality service delivery, customer satisfaction and cost-effective service provision. The objective of service design is to design IT services so effectively that minimal improvement during their lifecycle will be required. This lifecycle stage enforces the principle that the initial service design should be driven by a number of factors, including the functional requirements, the requirements within service level agreements (SLAs), the business benefits and the overall design constraints. The processes considered important to successful service design are design coordination, service catalogue management, service level management, availability management, capacity management, IT service continuity management, information security management and supplier management (OGCb, 2011).

Service Transition

ITIL Service Transition provides guidance for the service transition stage of the ITIL service lifecycle. The purpose of the service transition stage of the service lifecycle is to ensure that new, modified or retired services meet the expectations of the business as documented in the service strategy and service design stages of the lifecycle. To Plan and manage service changes efficiently and effectively, Manage risks relating to new, changed or retired services, Successfully deploy service releases into supported environments, Set correct expectations on the performance and use of new or changed services, Ensure that service changes create the expected business value, Provide good-quality knowledge and information about services and service assets are some of service transition objectives. Service transition processes are Change management process, Service asset and configuration management process, Knowledge management process, Transition planning and support process, Release and deployment management process, Service testing and validation process and Change evaluation process (OGCc, 2011).

Service Operation

ITIL Service Operation provides guidance for the service operation stage of the ITIL service lifecycle with the purpose of coordinating and carrying out the activities and processes required to deliver and manage services at agreed levels to business users and customers. Service operation is also responsible for the ongoing management of the technology that is used to deliver and support services. “Service operation is a critical stage of the service lifecycle” (OGCd, 2011, p.49). The specific objectives of service operation are to: maintain business satisfaction and confidence in IT through effective and efficient delivery and support of agreed IT services, minimize the impact of service outages on day to day business activities, and ensure that access to agreed IT services is only provided to those authorized to receive those services. Service operation life cycle stage comprises five processes namely event management process, incident management process, request fulfilment process, access management process, problem management process; and four functions: service desk, application management, technical management, and IT operations management (OGCd, 2011).The scope of this study includes these five processes.

Service Operation Processes

- ***Event Management Process:*** OGCd (2011) defines an event is any change of state that has significance for the management of a configuration item or IT service. Event Management manages events throughout their lifecycle. This lifecycle includes coordination activities to detect events, make sense of them and determine the appropriate control action. Effective service operation is dependent on knowing the status of the infrastructure and detecting any deviation from normal or expected operation. This is provided by good monitoring and control systems (OGCd, 2011). Every organization will have its own categorization of the significance of an event. There are many different types of events, but OGCd (2011) suggest that at least the three broad categories such as informational events, warning events and exception events be presented. Informational event refers to an event that does not require any action and does not represent an exception. On the other hand, warning event is an event that is generated when a service or device has reached a threshold that indicates a situation must be checked and appropriate actions taken to prevent an exception. The third category which is an exception event means that a service or device is currently operating abnormally (however that has been defined) impacting the business (OGCd, 2011).

- ***Incident Management Process*****:** OGCd (2011) defines an incident as an unplanned interruption to an IT service or reduction in the quality of an IT service or a failure of a configuration item (CI) that has not yet impacted an IT. Incident management is the process responsible for managing the lifecycle of all incidents. OGCd (2011) describes thepurpose of incident management is to restore normal service operation as quickly as possible and minimize the adverse impact on business operations, thus ensuring that agreed levels of service quality are maintained (OGCd, 2011).

- ***Problem Management Process*****:** OGCd (2011) defines problem as the underlying cause of one or more incidents. The Purpose of problem management process is to manage the lifecycle of all problems from first identification through further investigation, documentation and eventual removal. The problem management process has both reactive and proactive aspects where reactive problem management activities are performed in reaction to specific incident situations, proactive problem management activities take place

as ongoing activities targeted to improve the overall availability and end user satisfaction with IT services (OGCd, 2011).

- ***Request Fulfillment Process*:** OGCd (2011) defines 'service request' as a formal request from a user for something to be provided by IT organization. Request fulfillment is the process responsible for managing the lifecycle of all service requests from the users.
- ***Access Management Process**:* Access management is the process of granting authorized users the right to use a service, while preventing access to non-authorized users based on the policies and actions defined in information security management process of service design lifecycle stage (OGCd, 2011).

Service Operation Functions

- ***Service Desk Function:*** a functional unit responsible for dealing with a variety of service activities usually made via telephone calls, web interface, or automatically reported infrastructure events. This function is a Single point of contact for IT users on a day-by-day basis (OGCd (2011).

- ***Technical Management Function*:** Technical management refers to the groups, departments or teams that provide technical expertise and overall management of the IT infrastructure (OGCd, 2011).

- ***Application Management Function:*** is responsible for managing applications throughout their lifecycle. It is the custodian of technical knowledge and expertise related to managing applications (OGCd, 2011).

- ***IT Operations Management Function:*** the function responsible for the ongoing management and maintenance of an organization's IT infrastructure to ensure delivery of the agreed level of IT services to the business (OGCd, 2011).

The service operation functions are needed to manage the steady state operational IT environment. These are logical functions and do not necessarily have to be performed by an equivalent organizational structure. This means that technical and application management can be organized in any combination and into any number of departments (OGCd, 2011).

Continual Service Improvement

ITIL Continual Service Improvement describes best practice for achieving incremental and large scale improvements in service quality, operational efficiency and business continuity, and for ensuring that the service portfolio continues to be aligned to business needs. Guidance is provided for linking improvement efforts and outcomes with service strategy, design, transition and operation. A closed loop feedback system, based on the Plan-Do-Check- Act (PDCA) cycle, is established. Feedback from any stage of the service lifecycle can be used to identify improvement opportunities for any other stage of the lifecycle. This life cycle stage combines principles, practices and methods from quality management, change management and capability improvement. The seven-step improvement process with the purpose of defining and managing the steps needed to identify, define, gather, process, analyze, present and implement improvements is the only process used by Continual service improvement lifecycle stage (OGCe, 2011).

Service improvement must focus on increasing the efficiency, maximizing the effectiveness and optimizing the cost of services and the underlying IT service management (ITSM) processes. The overall approach to continual service improvement (CSI) and a continual cycle of improvement is illustrated on figure.

Figure 6 Continual service improvement approach *Source*: adopted from OGCe (2011)

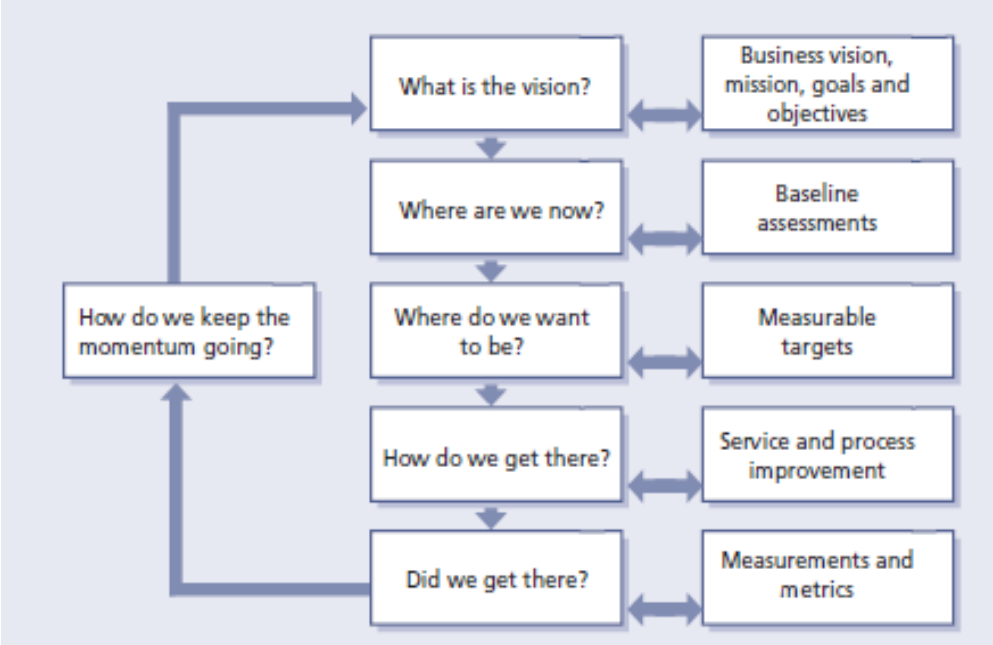


Table 3 The processes described in each core ITIL publication *Source*: adopted from (OGCa, 2011, p. 41)

ITIL Service lifecycle Stage	Processes described in each ITIL Service lifecycle stage
ITIL Service Strategy	• Strategy management for IT services • Service portfolio management • Financial management for IT services • Demand management • Business relationship management
ITIL Service Design	• Design coordination • Service catalogue management • Service level management • Availability management • Capacity management • IT service continuity management • Information security management • Supplier management
ITIL Service Transition	• Transition planning and support • Change management • Service asset and configuration management • Release and deployment management • Service validation and testing • Change evaluation • Knowledge management
ITIL Service Operation	• Event management • Incident management • Request fulfillment • Problem management • Access management
ITIL Continual Service Improvement	• Seven-step improvement process

ITIL Adoption benefits

Today, IT support organizations are not only facing the challenges of managing IT infrastructure, functionalities and capabilities to meet their customers and the end-users' requirements in daily operations, but also the challenges of providing services that would create organizational value and assist their customers to achieve their business objectives and contribute to their future success and growth (Spohrer, Maglio, Bailey & Gruhl, 2007; Hsu, 2011).

ITIL is one of the quality improvement tools or techniques specially designed for improving IT service quality (Shang & Lin, 2010). To gain advantages such as customer satisfaction as well as cost reduction, organizations are moving more towards ITIL (Vaitha and Francis, 2016). ITIL also helps organizations to become aware of the business value their IT services provide to internal and external stakeholders (Sheikhpour & Modiri, 2012).

Improving service quality, standardization of services, customer satisfaction and return on investment were considered as important benefits of ITIL in most of the reviewed researches by Marrone & Kolbe (2010), and from among the listed benefits of ITIL, improving service quality was taken as a major benefit in all of the reviewed researches. Worthen, B. (2005) as cited by Shang& Lin (2010) also stated some ITIL advantages to IT departments such as improvement upon project deliverables and time, resource utilization, a decrease in rework, reduced downtime and providing services that meet business, customer and user demands. As a result IT departments will increase their productivity and efficiency. ITIL provides systematic, process-based approach and is technology independent. It gives a detailed description of a number of important IT practices, tasks and procedures that can be tailored to any IT organization. ITIL has clear definition of various terms used in ITSM in a concise yet comprehensive manner (Sultana, 2013). In short, ITIL improves efficiency, effectiveness and economy of the ITSM. Organizations have significantly cut costs, have improved processing time and have enhanced their overall service provisions. The accurate measurement of service provides them with strategic information for decision making in their quest for return on investment and the alignment of IT with the business (Sultana, 2013).

Challenges of implementing ITIL Framework

Fixsen (2005) defined implementation as "specified set of activities designed to put into practice and activity or program of known dimensions". This definition of implementation is used for the purpose of this study.

Though many organizations worldwide are successfully taking up ITSM, not all are experiencing positive outcomes and many of them are confused about how to implement ITIL successfully (Mohammadi et al., 2015). Introducing ITIL in an organization is a complex endeavor, depending on the characteristics and the ambitions of the target organization. ITIL will affect almost every member of staff; it may lead to rearranging organizational structures, work practices and worker roles. New competence is needed, specifically in ITIL, and more generally in process thinking. ITIL requires a devoted focus on IT services and customers' needs, which more technically-oriented organizations may find challenging. A full adoption of ITIL may take years, and requires the dedication of managers as well as personnel (Mohammadi et al., 2015).

Implementation of ITSM brings about changes in the organizational culture, new processes and the training of the staff which helps in reorganizing the approaches used to do business supported by IT (Vaitha and Francis, 2016). However, as described in (Mohamed, 2008, p.316), "ITIL framework does not offer clear-cut implementation techniques. The implementation mechanism is left for the implementer to decide upon". Hsu (2011) summarizes the list of challenges of implementing the ITIL framework as identified by studies as well as the suggestions of overcoming these challenges.

Table 4 Summary of the challenges of implementing ITIL framework from literature review *Source*: adopted from Hsu (2011)

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
Pereira (2010)	A Maturity model for Implementing ITIL	• Organizational resistance to change • Unproven business value • Strong organizational culture	Pereira (2010) suggested in "A Maturity model for Implementing ITIL" that to Overcome these challenges of ITIL implementation, including the ones listed by Sharifi et al. (2008). According to Pereira, organizations need to use a maturity model such as CMM (Capability Maturity Model) with five maturity levels ("initial", "repeatable", "defined", "managed" and "optimizing")to assess its process capability by measuring the degree to which processes are defined and managed to guide the implementation of the ITIL Framework.

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
Shang and Lin (2010)	Barriers to implementing ITIL – A Multi-Case Study on the Service based Industry	• Dissatisfied customers due to the gap between the degree of improved service quality and customers' perception • Unable to satisfy customers' specific needs in time • Extra costs occurred in education and management • Time lag between investment in ITIL project and performance outcome • Conflicts between urgent needs for quality improvement and cost consideration • Employee resistance • Lack of integration ability • Conflict between different interest group • Difficult to assess the immediate effect of ITIL on the continuous process of improvement • Lack of collaboration between IT service support	

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
		departments	
Cater-Steel, Tan and Toleman (2009)	Implementing IT Service Management: A case study focusing on critical success factor	• Senior management support • Project champion • Relationship with vendors • Change in corporate culture • Project governance and execution • Realization of benefit	• Obtain Senior Management support • Senior management must understand the magnitude of the implementation and ensure that the project is adequately and appropriately resourced • Develop close and for the right relationships with the vendors to ensure effective technology transfer to the staff • Effective change management process to move the culture from a technology focus to a focus on service • Place a benefits realization plan to track and communicate tangible and intangible benefits • Appropriate

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
			appointment of process owners was carried out to achieve the transformation
Szabo & Feher (2009)	Current Challenges of IT Service Management in Hungary	CIOs have to face the strongly decreasing IT budgets of their organizations	
Sharifi, Ayat, Rahman & Sahibudin, (2008)	Lesson Learned in ITIL implementation failure	• Lack of management commitment • Spend too much time on complicated process diagrams • Not creating work instructions • Not assigning process owners • Concentrating too much on performance • Being too ambitious • Failing to maintain momentum • Allowing departmental demarcation • Ignoring constant reviewing of the ITIL	

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
		• Not memorizing ITIL books	
Keel , Orr ,Hernandez , Patrocinio & Bouchard (2007)	From a Technology oriented to a service oriented approach to IT management	"One of the most difficult challenges in implementing an ITSM strategy is the impact ITSM may have on the IT organization and staff due to the natural tendency of people to resist change"	• Establishing process ownership • Defining the scope of the process • Agreeing on process design • Developing process metrics • Designing a technical infrastructure process • Deciding on process implementation • Planning and executing process and associated infrastructure
Cater-Steel & McBride (2007)	IT Service Management Improvement – Actor Network perspective	• Lack of acceptance of new processes • Lack of understanding of why such changes are necessary	• Managerial instruments such as organizational restructuring and the definition of new roles and processes must be backed up by appropriate communication which provides a rationale for the changes, sets the

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
			context and draws people in • Develop a corporate mindset • Win hearts and minds • "Strong ground and good soil"– make sure messages from top management is well received, understood and supported by staff members
Cater-Steel & Tan (2006)	Transforming IT Service Management – the ITIL Impact	• Lack of Management Support • Resistance from technical staff • Delays in establishing an appropriate toolset • The difficulty of quantifying benefits • Resistance to adhering to the new documentation and communication processes. • Changing the focus from crisis management and workarounds to consideration of the 'real	• Senior management does not need an in-depth understanding of ITIL but must provide support in terms of resources and authority to enforce new policies • Encouraging staff to document the processes in actual use • Eliminate surprises • Initially look for quick wins • Genuine desire to improve customer

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
		problems' as defined by ITIL, resolving the important underlying problems • Measure return on investment • Communication and coordination between the various sections to provide a seamless end-to-end service	service and services delivery • Awareness campaign and Educate staff members • Have open discussions with affected staff, establish a comfortable environment for discussion
Cater-Steel & Tan (2005a)	Implementation of IT Infrastructure Library (ITIL) in Australia: Progress and success factor	• Commitment from senior management • Champion to advocate and promote ITIL Ability of IT staff to adapt to change • Quality of IT staff allocated to ITIL • ITIL training for IT staff	
Hochstein, Tamm & Brenner (2005b)	Service-oriented it management: Benefit, cost and success factors	• Lack of acceptance of new processes • Lack of understanding of why such changes are necessary	• Showing of "quick wins" and there by demonstrating the usefulness of service-oriented IT management (aiming at measurable project goals)

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
			• Striving for continuous improvement in order to guarantee the sustainability of success • Marketing campaigns (buy-in phase, management of expectations, use of internal publication media, road shows, workshops, seminars et cetera)in order to create acceptance and understanding • Obtaining support of management in order to be able to exert pressure • Implementing broad-based training and enforcing personnel development • Formation of virtual project teams so that the "new" processes would not be developed separate

Author	Publication	Challenges identified	Suggestions of overcoming the challenges
			from operational activities but simultaneously to achieve integration of service orientation into existing areas

Table 4 reviled as most of the studies examined such implementation of the ITIL framework from a project management or organizational change management stand point (Hsu, 2011). From a project management perspective, the management support, finance commitment, project execution and leadership, investment and return were regarded as the challenging areas for implementing the ITIL framework; from an organizational change perspective, challenges were also identified in regards to changing organizational culture, justifying the changes and overcoming employee resistance. According to these studies, having senior management support, developing an implementation strategy, careful planning and execution of the implementation projects as well as fostering an organizational cultural change were among the most appropriate method to meet the challenges of implementing the ITIL framework.

CSF to ITIL implementation

According to Rockart (1979) cited by Polland & Cater-Steel (2009) defines critical success factors (CSFs) are the "few keys areas that must go right for the business to flourish". Moreover, as described in section 1.2, Critical success factors are factors if they are not performed well, it is unlikely that the mission, objectives or goals of a business or project will be achieved (Polland& Cater-Steel, 2009). OGCa (2011) and Alemye (2015) also defines critical success factor (CSF) as Something that are critical or decisive for successful implementation of ITIL, IT service, process, plan, project or other and all of the challenges can be inverted to become critical success factors (CSFs) (OGCa, 2011). This definition is used for the purpose of the study. Summary of CSFs extracted by Alemeye (2015) from the review of literature is presented on table 5.

Table 5 Theoretical Pattern of ITIL Implementation CSFs *Source*: adopted from Alemeye (2015)

Critical Success Factors	References from Literature
Project management and governance	Mehravani and Hajiheydari (2011),Pollard and Cater-Steel (2009), Pederson et al.(2010), Cater-Steel and Tan (2005), Shang and Lin (2010), Cater-Steel et al.(2009),Iden and Langeland (2010), Marquis(2006),
Top management support and commitment	Mehravani and Hajiheydari (2011),Pollard and Cater-Steel (2009),Pederson et al.(2010),Cater-Steel and Tan (2005),Iden and Langeland (2010), Cater-Steel et al.(2009),Cater-Steel (2006),
Training and competencies of involved stake holders in ITIL project	Mehravani and Hajiheydari (2011),Pollard and Cater-Steel (2009),Addy (2007), Shang and Lin (2010), Iden and Langeland (2010), Cater-Steel (2006), Kabachinski (2010)
ITIL process implementation and applied technology	Mehravani and Hajiheydari (2011),Pollard and Cater-Steel (2009),Pederson et al.(2010), Pederson et al.(2010), Iden and Langeland (2010), Cater -Steel et al.(2009),Marquis (2006)
Organizational Change Management	Mehravani and Hajiheydari (2011),Pollard and Cater-Steel (2009),Pederson et al.(2010), Cater-Steel and Tan (2005), Shang and Lin (2010), Winter (2012)
Communication and Cooperation	Mehravani and Hajiheydari (2011),Pollard and Cater-Steel (2009), Shang and Lin (2010), Iden and Langeland (2010), Cater-Steel et al.(2009),Cater-Steel (2006)
Monitoring and Evaluation	Mehravani and Hajiheydari (2011),Pollard and Cater-Steel (2009)

Challenges and critical success factors of implementing ITIL service operation processes

A few researchers have covered the topic of ITIL benefits, challenges of implementation and the effectiveness of ITIL (Marrone & Kolbe, 2010). OGCd (2011) stated service operation challenges faced within service operation such as lack of engagement with development and project staff, and Justifying funding that need to be overcome. In addition the critical success

factors described in this publication are, Management support, Business support, Champions, Staffing and retention, Service management training, Suitable tools, Validity of testing, Measurement and reporting. However, challenges and critical success factors associated with the ITIL Service Operation process as offered by this official publication of the ITIL framework is rather vague compared to what the processes may encounter in reality.

Only very little literature offered the real case scenarios of implementation of the ITIL service operation processes.

Jantti & Cater-Steel (2017) revealed that common challenges that are faced in IT service operation of the cases under their study:

- Measurement of incident and problem management
- Cooperation and interfaces ITSM processes
- Classifying support requests is difficult
- Challenges in service operation terminology
- Support is too reactive
- Lack of rules how to handle reopened cases
- Lack of a problem manager
- Need for better change reporting
- Not enough time to record support cases
- SLA breached at the 2nd level
- Major incident concept unclear
- No responsible person for service feedback
- Customers/users have many contact points
- Lack of problem management procedures
- Poorly documented problem sources
- Informing Service Desk on problem solutions
- Customer feedback not delivered to staff
- Too much manual work in creating reports
- Lack of unified support practices

People not understanding the support request classification, the difference between incidents and problems, Service desk workers record several cases under one incident and Lack of a formal Configuration Management Database (CMDB) were some of the challenges pointed out by (Jantti, Shrestha, and Cater-Steel, 2012). In addition, Jantti (2008) discussed the following challenges which he believes are related to a specific ITIL service operation process which is problem management process:

- Terminology: ITIL terminologies were not widely or traditionally used in part of the IT industry.
- The lack of practical examples to show the distinctions of ITIL concepts such as incident, problem, service request and change request.
- The lack of guidelines as how knowledge management should interact with ITIL processes such as Problem Management.

The challenges or difficulties listed above focused mostly on the execution of the ITIL Service operation processes. However, some of the challenges associated with the initial setup of the ITIL service operation process such as, measurement of service operation processes, clarification of the interfaces and relationships between service operation processes and other ITSM processes, definitions of core metrics for support, classification of service support requests and a reactive approach to customer support were also mentioned. This study and its empirical research take into consideration of these implementation challenges.

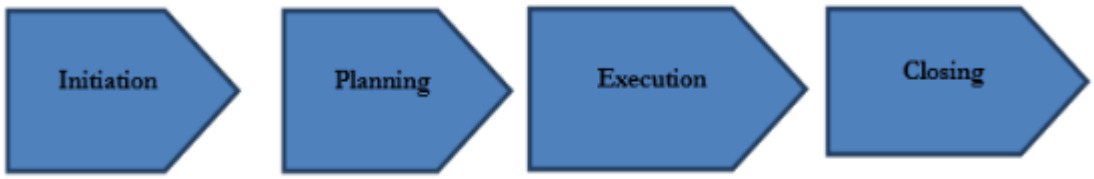
2.5. Project Management

PMI (2017) defines a project as a temporary endeavor undertaken to create a unique product, service, or result. In addition, OGCa (2011) describe a project as "*a temporary organization, with people and other assets, that is required to achieve an objective or other outcome. Each project has a lifecycle that typically includes initiation, planning, execution, and closure. Projects are usually managed using a formal methodology such as PRojects IN Controlled Environments (PRINCE2) or the Project Management Body of Knowledge (PMBOK)*".

As discussed by PMI (2017), Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management is accomplished through the appropriate application and integration of the project management processes identified for the project. Project management enables organizations to execute projects effectively and efficiently. Effective project management helps individuals, groups, and public and private organizations to: meet business objectives, satisfy stakeholder expectations, be more predictable, increase chances of success, deliver the right products at the right time, resolve problems and issues, respond to risks in a timely manner, optimize the use of organizational resources, manage constraints (e.g., scope, quality, schedule, costs, resources), balance the influence of constraints on the project (e.g., increased scope may increase cost or schedule), manage change in a better manner, and identify, recover, or terminate failing projects (PMI (2017). Poorly managed projects or the absence of project management may result in: missed deadlines, cost overruns, poor quality, rework, uncontrolled expansion of the project, loss of reputation for the organization, unsatisfied stakeholders, and failure in achieving the objectives for which the project was undertaken PMI (2017). The project management office (PMO) ensures that all projects and programmes are evaluated, managed and reported according to the enterprise and IT service provider's strategy (OGCa, 2011). Working with organisations to determine the most effective way to implement the ITIL Service Management framework, Rice (2020) recommends that a series of projects that are executed through a Programme Management Office is the most effective way.

Assad& Ahmed (2015) proposed that the IT IL implementation should be carried out as a project within the organization. Project management and governance throughout the implementation is the most important factors. Implementation of new processes requires change and it may affect both internally (employees) and externally (customers).

Figure 7 ITIL implementation Phases *Source*: adopted from Assad & Ahmed (2015)



2.6. Summary of the literature review

The literature review first examined the background of organizational IT governance and enterprise architecture for the fact that the study of this specific ITIL service lifecycle processes cannot be done in isolation from the broad IT Service Management, enterprise architecture and organizational IT governance context. Quality and quality management, project management, IT Service Management and the impact of IT services on organizational performances are also explored. The details of ITIL, which is one of the most widely adopted IT Service Management frameworks, were presented; the definitions of the ITIL Service lifecycle stages and a detailed description of the ITIL service operations and its process were also included.

The challenges and critical success factors for IT support organizations in implementing the ITIL framework and the ITIL service operation process are also incorporated. Table 6 shows Summary of the challenges for implementing the ITIL framework and the ITIL Service operation processes as identified by literature review; and Table 7 describes the Summary of the CSFs as identified for implementing the ITIL framework and the ITIL Service operation processes as identified by literature review.

Table 6 Summary of the challenges as identified by literature review

	Challenges identified from literature review for implementing ITIL Service Operation processes	**Challenges identified from literature review for implementing the ITIL framework**
Challenges that are unique	• Challenges in service operation terminology • Support is too reactive • Need for better change reporting • Not enough time to record support cases • SLA breached at the 2nd level • Major incident concept unclear • No responsible person for service feedback • Customers/users have many contact points (not having SPOC) • Poorly documented problem sources and procedures • Informing Service Desk on problem solutions • Customer feedback not delivered to staff • Too much manual work in creating reports • Lack of unified support practices • Service desk workers record several cases under one incident: Lack of rules how to handle reopened cases	• The financial commitment. • The establishment of procedures, roles and responsibilities. • The measurement of return on long term and short term business value. • The customer expectations and perceptions. • The return of investment in terms of service improvement. • The resistance of the IT support teams. • Relationship with the external vendors and consultants. • The management of the implementation project.

	Challenges identified from literature review for implementing ITIL Service Operation processes	Challenges identified from literature review for implementing the ITIL framework
	• The lack of guidelines as how knowledge management should interact with ITIL processes • Measurement of service operation processes(e.g. Measurement of incident and problem management) • Justifying funding • Clarification of the interfaces and relationships among service operation processes and other ITSM processes	
Challenges that are common to both	• The Management commitment and support • The Understanding of the processes by IT support teams • The resource committed to the implementation • The motivation and willingness of the staff who participate in the ITIL processes • The lack of practical examples to follow • Change of culture, discipline and focus in providing IT support • Lack of a formal Configuration Management Database (CMDB) and tool set • The collaboration of IT support teams	

Table 7 Summary of the CSFs as identified by literature review

	CSF identified from literature review for implementing ITIL Service Operation processes	**CSF identified from literature review for implementing the ITIL framework**
CSF that are unique	• Business support • Implementation Champions • Staffing and retention • Service management training • Measurement and reporting	• Project management and governance • Training and competencies of involved stake holders in ITIL project • Organizational Change Management • Communication and Cooperation • Monitoring and Evaluation
CSF that are common to both	• Top management support and commitment • ITIL process implementation and applied technology	

Chapter Three: Research Methodology

This chapter covered the research approach, research design, methods of data collection, and the methods of data analysis used.

3.1. Research Approach

Inductive approach and Deductive approach are the two broad types of research approaches. "Y*our research should use the deductive approach, in which you develop a theory and hypothesis (or hypotheses) and design a research strategy to test the hypothesis, or the inductive approach, in which you would collect data and develop theory as a result of your data analysis"* (Saunders, Lewis & Thornhill, 2007, p. 145). Induction approach gives less concern to the need for statistical generalization to population. Besides, this approach gives an understanding of the meanings humans attach to events, and understanding of the research context through collecting and analysis of qualitative data (Alemeye, 2015). For the reason that the objective of this study was to explore the experience and perception of individuals involved in the implementation process of ITIL in CBE with regards to challenges and critical success factors, the research approach used in this research was inductive approach.

3.2. Research Design

According to Kothari (2004), the function of a research design is to ensure that the evidence obtained enables the researcher to answer the research questions as unambiguously as possible.

Yin (2003) as cited in Alemeye (2015) defines research design as "the logical sequence that connects the empirical data to the study's initial research questions and, ultimately, to its conclusions, and its main purpose is to avoid the situation in which the evidence doesn't address the initial research questions". As mentioned in section 1.3, the main objective of this study was to empirically identify or explore the challenges, the possible ways, methods and approaches to overcome the identified challenges, and critical success factors to the implementation of ITIL service operation processes in Commercial Bank of Ethiopia (CBE). The choice of research strategy is guided by the research question(s) and objectives, and the control an investigator has over actual behavioral events (Yin, 2003, as cited in Alemeye (2015). Robson (2002) as cited in Saunders et al. (2007) defines case study as "a strategy for doing research which involves an

empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence". Within a case study, the boundaries between the phenomenon being studied and the context within which it is being studied are not clearly evident; which is the complete opposite of the experimental strategy, where the research is undertaken within a highly controlled context. It also differs from the survey strategy where, although the research is undertaken in context, the ability to explore and understand this context is limited by the number of variables for which data can be collected (Saunders et al., 2007).

The researcher choose case study to enquire into a contemporary phenomenon in its natural context (Yin, 2014). According to Saunders et al. (2007), the case study strategy also has considerable ability to generate answers to the question *why* as well as *what* and *how* questions, although *what* and *how* questions tend to be more the concern of the survey strategy. For this reason the case study strategy is most often used in explanatory and exploratory research. Case study provides the opportunity to ask powerful questions and to capture the richness of organizational behavior (Gable, 1994). Therefore, in this study, since the phenomenon being evaluated is a contemporary practice & less researched, and has no clear & single set of outcomes, an exploratory case study strategy was applied.

Yin (2003) as cited in Saunders et al. (2007) distinguishes between four case study strategies based upon two discrete dimensions: single case v. multiple cases; holistic case v. embedded case. In addition, Yin (2003) as cited in Alemeye (2015) described as the unit of analysis defines what the case is - e.g. an event, a process, an individual, a group or an organization. If the researcher only wants to study one single thing or a single group, a single case study is the best choice which makes also the researcher to get a deeper understanding of the subject (Gustafsson (2017).

"A single case is often used where it represents a critical case or, alternatively, an extreme or unique case. Conversely, a single case may be selected because it is typical or because it provides you with an opportunity to observe and analyze a phenomenon that few have considered before" (Saunders et al., 2007). Because of its uniqueness and to have a deeper understanding of the exploring subject a single case study was chosen. CBE is a unique case for the fact that, it is the largest banking sector of the country with more sophisticated IT

infrastructure and IT services to be managed, and with all ITIL Service Operation Processes implemented. In addition, access to available data, preliminary evidence that the case has had the experience or situation that the writer is seeking to study, and willingness of knowledgeable individuals to participate on the study made it revelatory to conducting the study in the case company.

3.2.1. Data Source

For the purpose of this study both primary and secondary data were collected. As a secondary data, available information including CBE official documents which constituted organizational profiles, published and unpublished documents produced through the initiation and implementation of the ITIL Service Operation related documents such as Reports, Policies, procedures, Literatures, ITIL Project documents, frameworks, designed processes and other documents were reviewed. The documents are generally used to verify the participants' factual statements obtained in semi-structured interviews. The document analysis enabled the researcher to double-check regarding particular issues and dates that participants had difficulty remembering during the interviews.

Primary data gathered through semi-structured interview and direct observation. A purposive sampling technique from the non-probability sampling method was used in the research. Because, to collect relevant data that could help achieve the objective of the study, involving knowledgeable individuals on the subject of the study was crucial. Therefore, the sample frame were obtained from list representatives of ITIL Implementation project team, Application Management Department, Infrastructure Management Department, IS Operations Support Department, Internal IT help desk, South Addis Ababa District IT support and North Addis Ababa District IT Support in the case organization CBE. Respondents were screened by their exposure and certification level of ITIL framework. The IT professionals actually involved in key decisions about ITIL implementation were also involved. Considering the number and experience of ITIL experts in the case organization under the study, 12 participants were involved. Besides, data were collected through direct observation of the researcher.

3.2.2. Data Collection Methods

Primary data were collected through semi-structured interview and direct observation. Interviews are guided conversations that are usually one of the most important sources of evidence, and it is categorized as structured, semi-structured, and unstructured. On the other hand, direct observation refers to the situation where the observer watches or listens to the events directly (Yin, 2003, as cited in Alemeye, 2015). According to Paton (2002), direct observation have advantages for the fact that it enables the observers understand and capture the setting within which people interact, see and understand things that people in the location pay no attention, and get things that people will be reluctant to talk about in an interview. Observations can be structured, semi-structured, or unstructured. Unlike structured, unstructured observation do not follow a checklist. Thus, unstructured direct observation was considered useful for this study.

Structured interviews use questionnaires based on a predetermined and standardized or identical set of questions and are also referred as interviewer-administered questionnaires. In semi-structured interviews the researcher will have a list of themes and questions to be covered, although these may vary from interview to interview. This means that some questions in particular interviews might be omitted given a specific organizational context that is encountered in relation to the research topic. The order of questions may also be varied depending on the flow of the conversation. Unstructured interviews are informal. There is no predetermined list of questions in unstructured interviews to work through in this situation, although having a clear idea about the aspect or aspects that you want to explore are required. The drawback of unstructured interview is data overload which could be difficult for analysis. On the other hand the problem with structured interview is that the research is most likely biased towards the researcher‘s experience and perception (Saunders et al., 2007; Alemeye, 2015).

The basis for choosing semi-structured interview in this study was that it is flexible and allow the researcher understand the perspective of the interviewees, it gives the researcher the chance to refocus the questions, or prompt for more information, if something interesting or new emerges. Moreover, it overcomes the drawbacks of structured interview and unstructured interview.The interviews in this study were conducted based on the convenient time of respondents using the interview questions that are adopted from literature regarding ITIL Implementation and it is

mentioned in the annex. Interviewees were informed about the purpose of the research and about the interview questions beforehand through telephone so that it helps them get prepared. At the beginning of the interview, the anonymity of their identities and responses was assured. The interviewees were further informed that they were not bound to answer all the questions and could reserve their comments to any question they may have felt uncomfortable in answering. The interview questions were presented to the interviewee in English. However, with the assumption that communication with one‘s first language is simple and useful for an in-depth discussion, during the interview, some required explanations on the interview questions conducted in Amharic. At the time of interview, the interview short notes were taken carefully so as not to miss important points. Moreover, data collected by direct observation of the researcher in the form of field notes were also organized and transcribed on the same date as the observation. During transcript writing points which were found incomplete or ambiguous were further elaborated by the interviewee through telephone discussion. English language was used for taking short notes and transcript writing.

3.3. Data Analysis Method

The data collected was analysed using Qualitative data analysis.The goal of qualitative data analysis is to uncover emerging themes, patterns, concepts, insights, and understandings (Paton, 2002). As described by Roller **(**2019**),** the Qualitative Content Analysis method is defined as the systematic reduction of content, analyzed with special attention to the context in which it was created, to identify themes and extract meaningful interpretations of the data. The reference to *content* in this definition embraces all appropriate data sources, moving beyond text to include images, video, audio, graphics, and symbols. Context is also referred to as "the juxtaposition of words, substance, and 'broader environment' of the content" Roller **(**2019**)**. Vaismoradi, Turunen, & Bondas (2013) also discussed content analysis as a systematic coding and categorizing approach used for exploring large amounts of textual information unobtrusively to determine trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication. Content analysis may be suitable for the simple reporting of common issues mentioned in data (Vaismoradi et al., 2013). Thus, Qualitative content analysis was used for the purpose of this study.

The researcher transcribed all twelve interviews for the qualitative content analysis. During the analysis, without referring to preexisting knowledge of the research topic from either personal experiences or literature review, the researcher closely examined participants' answers and responses in the interview context. The meaning of the participants' answers and responses were constructed only with the participants' own words and the context of the interviews to ensure the maximal level of accuracy in reflecting the participants' understanding of the topic. The content analysis was conducted as a learning process without pre-assumptions; the researcher was the learner in this process and the participants' views were perceived by the researcher as of paramount importance. Overall, the researcher relied on the most accurate and objective interpretation and reflection of the participants' understanding to reach the conclusions. During the content analysis process, the researcher identified themes of the challenges and critical success factors for implementing the ITIL Service Operation processes as they emerged. Based on these themes, the researcher built categories for the participants' answers and responses. The researcher then summarized all answers and responses in each category and removed duplicate items. This resulted in a list of the challenges and critical success factors for implementing the ITIL Service Operation processes as being identified collectively by all participants' and exhaustive of all the answers and responses received in the interviews. For each challenge and identified, the researcher kept a record of how many participants had mentioned it during the interviews. The content analysis steps taken to finalize the list of the challenges and critical success factors will be further elaborated in chapter 4.

3.4. Trustworthiness and Credibility

In order to increase the trustworthiness and credibility of the study the following strategies were used:

- Data triangulation was done by collecting data from multiple sources and different roles such as project members, process owners, and process practitioners. The reason for taking the data from those working at roles performing different responsibilities was to have an in-depth understanding of the issue under discussion. Therefore, the findings and determinations are likely to be more precise and convincing.
- The initial draft of the case study report revised by three (one of the Project members, one of the process owners and one of the process practitioners) interviewees and confirmed that there is no misunderstanding or misinterpretation of their ideas.

On the other hand, since the basis of this research was built on academic resources, the researcher tries to select the most important and reliable information in the area of ITSM and ITIL concepts. So it can be assumed that the theoretical part has the accepted level of reliability from the researcher's point of view. The researcher has selected the case study organization by doing the preliminary study and run semi-structured interviews to gather appropriate information. Interview guide and a flat case study data base were developed for the purpose of conducting the interview in a uniform manner for all the interviewees, and not to miss interview question during the interview session. The people who had been interviewed are experts in the related area and the researcher used her knowledge which was acquired from theoretical part to make the empirical part as reliable as possible.

Chapter Four: Research Findings

In the previous chapter the research methodology that the researcher adopted in order to gather, analyse and evaluate the useful data was discussed in detail. Therefore, the purpose of this chapter is to present the findings from the analysis of the case study.

4.1. Profiles of Research participants

The analysis presents the distribution of the respondents by department and their experience in CBE and exposure to ITIL. In the semi-structured interview 12 individuals with broad involvement in CBE ITIL implementation process participated separately. Table 8 shows the profiles of each interviewee.

Table 8 Profiles of Research Participants

Role - with respect to ITIL Processes	Educational Background	ITIL Certification Level	Department	Gender
ITIL implementation project Team Leader, ITIL Service Operation Process Owner	B.Sc Computer Science	ITIL Foundation, PPO, RCV, SOA,OSA	ITIL Implementation project, Information Systems Quality Assurance Department	M
ITIL implementation project Team Member, ITIL Service Operation Process Owner	M.Sc in Computational Linguistics	ITIL Foundation, PPO, SOA,OSA	ITIL Implementation project, Information Systems Quality Assurance Department	F
ITIL implementation project Team Leader, ITIL Service Operation Process Owner	B.Sc in Information Technology	ITIL Foundation, PPO,OSA	ITIL Implementation project, Information Systems Quality Assurance Department	F
ITIL implementation project virtual team Member, ITIL Process practitioner	M.Sc in computer science	ITIL Foundation, Service Strategy, PPO, OSA,	IS Service Strategy management	F
ITIL implementation project virtual team Member, ITIL Service operation process practitioner	B.Sc in Information Technology	ITIL Foundation, PPO, SOA, RCV	Information Systems Application management	M
ITIL Service operation process practitioner	B.Sc in Information Technology	ITIL Foundation,	Information Systems Application management	M
ITIL Service operation process practitioner	B.Sc in Computer Science	ITIL Foundation, Service Transition	South Addis Ababa District IT Support	F
ITIL implementation project virtual team Member, ITIL Service operation process practitioner	B.Sc in Information Technology	Foundation, ITIL Continual Service Improvement,	IS Operations Support Department	M

Role - with respect to ITIL Processes	Educational Background	ITIL Certification Level	Department	Gender
		Service Operation		
ITIL implementation project virtual Team Member, ITIL Service operation process practitioner	M.Scin computer science	ITIL Foundation, ST	Internal IT Help Desk	M
ITIL implementation project virtual Team Member ,ITIL Service operation process practitioner	M.Scin management	ITIL Foundation, SS,SD	Information Systems Infrastructure Management Department	M
ITIL Service operation process practitioner	B.Sc Information Technology	ITIL Foundation	Information Systems Infrastructure Management Department	M
ITIL Service operation process practitioner	B.Sc Computer Science	ITIL Foundation	North Addis Ababa District IT Support	M

Key: - PPO: ITIL Intermediate Planning, Protection & Optimization; OSA: ITIL Intermediate Operational support and Analysis; SOA: ITIL Intermediate Service Offering and Agreements; RCV: ITIL Intermediate Release, Control & Validation

4.2. The ITIL Implementation Process

During the interviews Project members were asked general questions in relation to the driving forces to the ITIL implementation, its initiation, ITIL project team composition, and the process implementation approaches, to get the highlight of the ITIL implementation process in CBE.

With respect to ITIL implementation process in CBE, it was revealed that the major driving forces for the implementation of ITIL were: the inability of the existing IT management system to manage the ever increasing complexity of the IT infrastructure of the company and the critical dependency of Information systems division and other CBE divisions on IT services and their urgent need to get quality IT services. Forced by the mentioned driving factors was evidenced that CBE started to look for a better ITSM system and ITIL was considered to be the best

framework for that purpose. This idea was initiated by the company's IS Sector itself as part of its strategic plan.

Evidence supported that after approval of the top management to implement ITIL, key activities performed were: ITIL foundation Training for all IS staff and the management, ITIL Capability training provision for 22 staffs selected from each Information systems department, ITIL Lifecycle training provision for VPs, Directors and managers, establishing ITIL implementation project and assigning project manager(Core Team), establishing Virtual Team to act as interface or single point of contact for respective Information system departments, contracting external consultant to do gap analysis, doing gap analysis based on the long-term vision of the company, planning and creating a road map to provide overview of how implementation will be executed. In relation to this Project members mentioned that:

"According to the road map, our focus was to start with identified pain areas, defining 11 (All of the service operation processes except Access Management; Service level management, Capacity management, Availability management and Information security management from Service design; Change management, Service asset and configuration management process, Release and deployment management process from service transition) processes with the help of external consultant. The consultant designed all of the 11processes. However, the processes were not tailored to CBE context as much as expected because of the consultant's incapability. Then CBE core team in coordination with the virtual team members excluding the consultant continued working on the project. We have added 3 additional processes (Access management, Knowledge management and service catalogue management). Therefore, 14 processes out of the total 26 ITIL processes are designed being under the scope of ITIL implementation project."

Composition, skill, and competency of ITIL implementation project team members were other issues of discussion. With this respect, the study revealed that CBE ITIL implementation project team members were mainly from IT back ground and every one of them were ITIL certified at foundation and capability level, but had no previous ITIL implementation experience. Explaining about that Project Member stated:

"*With respect to team members composition we gave great regard to employees from Information Systems sector mainly because it was initially planned to give the overall responsibility to this sector to initiate, execute, follow up, and oversee the project. Therefore, all team members were from IS background. When the project team was organized, high concern was taken in selecting the team members particularly with their ITIL foundation exam score. Thus, ITIL knowledge was taken for granted. When I say this it doesn't mean that previous ITIL implementation experience are futile. If they had previous experience and project management skill, really they would contribute a lot. In addition, positive attitude and commitment to bring change were also basic for the implementation."*

4.3. Views towards the ITIL framework and its implementation

During each of the 12 interviews, the researcher asked the initial question shown in annex, first to settle the participants and to establish rapport. It was also a way of getting their views on the ITIL Framework.

All of the participants had experiences working with the ITIL framework in the CBE ITIL implementation project being as a project member or process practitioner. Throughout the interviews, the researcher found that the views towards ITIL as an IT Service Management framework were positive overall. Most of the participants expressed the view that ITIL was a framework that IT service providers should adopt; they also see this framework being in the process of being adopted by even more Ethiopian organizations. Several benefits of ITIL were highlighted in the interviews: Internally for the IT service provider, ITIL defines roles and responsibilities for IT professionals and also how these different roles and functions should interact with one another, this helps to break down the functional silos in delivering IT services. In addition it benefits IT organizations to build the capability of being proactive, continual improvement culture, Resource management and performance management. On the other hand, externally, ITIL provides an industry standard for managing and delivering IT services. The only negativity expressed towards ITIL is that the bulk documentation and multiple processes; some participants believed that activities such as risk management and implementation procedures were missed out by this framework, other participants thought that the framework left room for different interpretations, and as a result, how it was implemented and the extent of the implementation may vary between organizations. Despite the overall confidence on the ITIL

framework, most participants regarded the appropriate and successful implementation of this framework as crucial in realizing its benefit.

A summary of the themes that emerged from the answers and responses to the initial question are shown on Table 9.

Table 9 Themes emerged in relation to the views of ITIL framework

Themes	Comments made for the ITIL framework during the interviews
The general perception of ITIL framework: Positive ITIL framework perception overall	*"ITIL is a very good framework to manage IT services"*
	"ITIL is all about Capability and System thinking, not technology so it very useful to be implemented"
	"Really nice to have it"
	"ITIL is very much useful. But it is better to have COBIT with ITIL"
	"To have ITIL, definitely adds value but I don't think it is a must to have"
	"It is a very good framework to have in an organization like CBE"
	"It's good approach to be followed"
	"It is good to have ITIL in companies to have good IT service framework."
	"Positive view with respect to CBE's context; but other companies may assess their environment and consider other standards, frameworks or best practices as an alternative "
	"It's nice to have it"
	"I didn't understand ITIL at first, and I was saying what is it for? But, later, it made me say that 'IT-service excellence will not be achieved without ITIL'."
	"It is good to have"

Themes	Comments made for the ITIL framework during the interviews
ITIL is believed to be applicable and in the process of being adopted by more organizations in Ethiopia	*"I think ITIL is initiated from benchmark organizations' experience and it is adopted by only few companies in Ethiopia. Other companies are following to start implementing, because of its applicability in Ethiopia."* *"It's very difficult to make it visible/adapt/ since we have change resistance culture but once adapted it is very good approach to properly manage IT service. I think companies are planning ITIL implementation following the steps of CBE"* *"It is applicable in Ethiopia, but to decrease the implementation effort, I think continuous trainings are required, and if possible, better to have ITSM introductory course in Ethiopian Universities along with IT courses."* *"It is applicable to Ethiopian companies with IT services (like Telecom, Banking and insurance companies), I think more Ethiopian Banks are following CBE and started to adopt ITIL."* *"I believe it is applicable for any organization with IT Department in Ethiopia"*
ITIL is believed to benefit the IT support organization by defining IT professionals' roles and responsibilities and working relationships through collaboration	*"Organized IT-service delivery, better management of service and service disruption, clear cut responsibilities among IT departments are some of the benefits of ITIL"* *"it helps to have defined roles and responsibilities"* *"Ease service reporting and as a result improve decision making"* *"Enhance collaboration among departments and units"* *"Knowledge management and employee clarity on their respective roles and responsibilities"* *"I like ITIL for the inclusion of ways to set clear Roles and responsibilities (RACI Matrix) "*

Themes	Comments made for the ITIL framework during the interviews
ITIL is believed to benefit the IT support organization by increasing the capability of managing Resources	*"Resource management : to identify or measure hidden tasks"* *"Cost reduction on service delivery"* *"Helps to understand both service provider and customers requirement, as a result helps to increase return on investment "*
ITIL is believed to benefit the IT support organization to manage performance	*"To measure your current performance and plan your next task as per the measurement"* *"Improves IT services provision capability"* *"Helps to define Key performance indicators (KPIs)"* *"Measured customer values"* *"Very easy to measure the amount of support given"* *"To manage all service assets or Configuration Items(CIs)"* *"To manage all activities of IT environment "* *"Minimize the time to resolve any issue"* *"Improved user satisfaction"*
ITIL is believed to benefit the IT support organization to be proactive and have continual improvement culture	*"To track and monitor activities"* *"To avoid firefighting "* *"Brings Continual improvement culture"*

Themes	Comments made for the ITIL framework during the interviews
ITIL is believed to benefit the IT support organization to build the capability of standard way of doing things	*"Offers standard IT service management capability"* *"Brings Single point of contact in to picture"* *"Brings standardized way of supporting. It improves incident management, services request fulfilment, problem management and changes management of IT service provision."* *"Helps automate the support process"* *"standardized management of operations"* *"Help to prioritize and categorize tickets easily"* *"Standardization and uniformity"* *"To be structured because it recommends functions"* *"Service orientation "* *"Ease the tracking of incident and event tickets"* *"Improves communication"*
The successful and appropriate implementation of ITIL according to organizational environment was seen crucial to realize its benefit	*"For a successful ITIL implementation, organization culture and skill should be studied first"* *"if implemented successfully as per an organizational context, it will simplify the IT service delivery and help to manage the IT service well"* *"ITIL implementation depends on Organizational culture"* *"I like ITIL for its Customizability nature towards specific requirement and organizational context"* *"I think ITILs Adaptability nature is one of its best features it has"* *"To implement ITIL we have to know the organizational culture, Organizational trend and requirement"* *"ITIL implementation may fail if organizational context is missed"* *"Implementation is directly affected by organizational environment"* *"There should always be scoping and tailoring to realize ITIL's benefit"*

Themes	Comments made for the ITIL framework during the interviews
The ITIL implementation : how the framework is interpreted and used - can vary and there is room for different interpretations	*"It's bulk document, and difficult to go across"* *"I wish ITIL includes implementation procedures. Because improper implementation of ITIL may lead to raise change resistance and create framework hatred"* *"ITIL has multiple processes, requires longer time to get familiarized"* *"I wish ITIL listed some mandatorily required processes (I wish ITIL listed the Service operation as mandatory to have for example)"* *"It could have been better if ITIL also emphasized on the management of IT Project aspects clearly"* *"It could have been better if there was an independent risk management process in ITIL"*

4.4. Views towards the ITIL Service operation process and its implementation

The second question the researcher asked during the interviews was the participants' view towards the ITIL service operation process and its implementation.

The participants had high expectations for Service operation processes to reduce overall service down time, improve service delivery and operational excellence and increase customer satisfaction. There is a positive perception towards the ITIL service operation processes and the benefit it may bring to the IT support organizations as well as their customers.

Just as for the ITIL framework, the participants regarded the successful implementation of the ITIL service operation processes as crucial in realizing its benefits. Despite generally wanting to see the ITIL service operation process being better understood, better followed and more recognized in providing IT services, the participants also regarded the implementation of these processes as less straightforward. Comparing to other ITIL service operation processes, the participants saw more challenges of implementation of Problem management, Incident Management and Event management processes. The participants also believed that the

implementation of the ITIL service operation processes would need the financial and resource investment.

Table 10 Theme emerged in relation to the views of the ITIL Service Operation Processes

Themes	Comments made for the ITIL Service Operation Processes during the interviews
The ITIL service operation processes are generally viewed as being valuable	*"All service operation processes are usable in our day to day activities. They are interrelated to each other and very important for IT service delivery."* *"To manage operations of Incident, Event, Problem, Request, access ITIL is practical solution"* *"Very usable. In large IT infrastructures, IT-service management without these processes is impossible!"* *"I think it's very usable but a little difficult to implement"* *"Service operation processes should be the first priority to be implemented on organizations like CBE"* *"Service operation processes are definitely usable, brings common understanding and helps to speak common language among the department s"* *"It is very fundamental to have for any IT sector"* *"Service operations are very usable, however the processes should be well integrated and they while being designed"*
There are high expectations from IT service operation Processes for the Service operation processes	*" From service operation we get the assurance of Service availability as a result Decreasing service down time"* *"if implemented successfully, Service operation processes enables an organization to have efficient IT service delivery, minimize incident resolution time, efficient access and request management"* *"Operational excellence, Easy decision making, decrease system failure,*

Themes	Comments made for the ITIL Service Operation Processes during the interviews
to reduce overall Service downtime, improved service delivery, operational excellence, increased customer satisfaction	*Increase customer Satisfaction are the benefits that an organization gets of successful implementation of ITIL service operation processes."* *"with well defend response time, Incident management process brings required excellence on Service delivery"* *"All Service operation processes IT organizations to have Service quality, Customer satisfaction, Standardization and operational excellence"* *"all of the service operation processes encourages logging of tickets"* *"Request Fulfilment helps on managing our resource"* *"There will always be measurable tasks"*
There are high expectations from a service delivery perspective for the Event and problem management processes to be proactive	*"Most of the time Service operations are reactive but using Event management it will also help to interact proactively before major incidents occur."* *" Event management is all about monitoring configuration Items health status which helps to take proactive measures"* *"Problem management is very helpful to take proactive measures, because it avails workarounds and focuses on resolving the root causes"* *"Event and problem management processes are proactive in nature"*
The implementation of the ITIL service operation process are understood to be difficult	*"Problem management implementation depends on incidents management implementation; it is difficult to be implemented excluding incident management"* *"I think Incident Management is difficult to be implemented because it touches multiple departments, and depends on Service Level management process implementation (i.e. OLA and SLA agreements are required)"* *"Problem management is very difficult to be implemented, because it is very difficult to differentiate the incidents from problems"*

Themes	Comments made for the ITIL Service Operation Processes during the interviews
	"In the context of CBE, all of the Service operation processes are difficult because of the dependency on organizational Structure, Training, Process designing and ITSM Tools." *"Incident Management process implementation is difficult because it interacts with all processes*" *"It is difficult to implement all of the ITIL service operation processes without having the configuration management system (CMS) which is well change managed".* *"Event management process is the most difficult one to be implemented and is the determinant process for the rest of all processes. Because, we have to have perfect and properly tuned monitoring tools that enable end-to-end infrastructure and service visibility".* *"I think problem management is a very difficult to be implemented because it requires, definition of Problem analysis techniques (for root cause analysis)."* *"Problem management is difficult because it requires very much technical knowledge of the process practitioners on problem definition and problem resolution. In addition the process has very high dependency on other service operation processes"*
The implementation of the ITIL service operation processes requires financial and resource investment	*"The Implementation of ITIL service operation processes requires financial and resource investment. (e.g. requires hiring consultants)"* *"The Implementation of ITIL service operation processes requires financial and resource investment (e.g. Training investment)"* *"In the context of CBE which has a very vast infrastructure and multiple CIs to be managed, the ITIL service operation implementation may require sophisticated and adaptable service management tools. Therefore, in my view, Investments for ITSM tool, Training and hiring consultants are required."* *"Since the concept is new to the country, it required consultants with the*

Themes	Comments made for the ITIL Service Operation Processes during the interviews
	requires hiring experience"
	"The implementation will require project cost, Training cost, Certification cost. Consultant might also be required depending on the project team's capability"
	"There will definitely be training cost prior to implementation. But hiring consultant might not be necessary because it depends on the commitment of leadership and performers"
	"Trainings cost, awareness creation costs, certification costs ,workshop costs, expertise is also required and hiring consultant "
	"Training (Capacity Building) and certification cost, consultancy costs are the investments required"

4.5. The challenges identified to implement the ITIL Service Operation Processes

The researcher asked each of the participants the third questions to get their insights on the challenges associated with the implementation of the ITIL Service Operation Process.

The researcher identified the themes as they emerged from interpreting the participants' answers and responses and reflecting on the participants' understanding of the challenges; based on the themes identified, the following categories were built:

The organizational factors: some participants believed organizational factors such as the organizational structure, politics and culture may impact the implementation of the ITIL Service operation process implementation. It is also believed that members of the IT support organizations may be reluctant to change the way they provide IT support and therefore pose challenges to the implementation of new support processes. One participant also saw the adaption of these processes and the design of related policies in the organizational environment being challenging because of missing enforcements that oblige to have policies, processes and procedures. In addition, the participants reflected that too many initiatives down to the

stakeholder resulted to framework confusion. After summarizing the views, the following challenge items were listed:

Challenge 1: Breaking the organizational culture

Challenge 2: Resistance to change

Challenge 3: Organizational Politics: conflict of interest

Challenge 4: Governance related issues: Enforcements that oblige to have policies, processes and procedures

Challenge 5: Re-works on re-definition of roles and responsibilities of departments, Activity demarcation because of organizational restructuring

Challenge 6: Too many initiatives down to the stakeholder resulted to framework confusion

The interrelation with other ITIL processes: many participants held the view that ITIL processes should interact with and rely on one another and with other frameworks and standards that are implemented within the organization. A number of participants believed that the successful implementation of the ITIL service operation process would require a mature Service Level Management process, Service Catalogue Management process, Information Security Management process, Change Management process, Service Asset and Configuration Management process, Knowledge Management Process, and Early life Support Process; and it would also be challenging to achieve the desired interactions and relationships between these processes. The following challenge items were listed for this category:

Challenge 7: Process integration

Challenge 8: Difficulty in integrating the ITIL service operation processes with other frameworks that was implemented in CBE (incident management in ISO 27001 and Crisis management in Business continuity)

Challenge 9: The maturity of other ITIL processes that interact with the ITIL service operation processes

Challenge 10: Availability of Configuration Management System (CMS) and ITSM tools

The investment for the ITIL Service Operation processes: the investment for these processes, especially in terms of finance and resources, was seen by some participants as an important challenge; one participant mentioned that he had never seen adequate resources being

committed to the Service Operation process as required. Some participants also pointed out that the investment would appear hard to justify especially the return of such investment may not be seen immediately. A number of participants also mentioned that experienced consultant for the implementation process and other key resource for its implementation, are very hard to recruit; as a result, the hiring of a consultant should be seen as an investment challenge for the IT support organizations. Other investments mentioned by the participants also included the tools purchased to implement the processes. From this category, the following challenge items were listed:

Challenge 11: Costly with regard to recruiting consultants: because the framework is derived from other countries experience (very different contexts)

Challenge 12: Implementation Project resource (e.g. budget)

Challenge 13: The tools used for implementing the ITIL Service operation processes

The buy-in of the ITIL Service Operation processes: it was pointed out by the participants that the buy-in of these processes would be an important condition for the processes to be properly followed or executed within the IT support organization. The buy-in can be understood as the commitment for the processes and the belief of its benefit. Not only is the buy-in required from the Management, it is also required from the IT professionals and the users. After summarizing the views belong to this category and removing duplicate views, the following challenge items were listed:

Challenge 14: The IT support teams' understanding of the ITIL service operation processes and their benefits

Challenge 15: Top Management support and acceptance

The understanding of the ITIL Service Operation Processes: It was highlighted by the participants that the ITIL service operation process was generally less well understood as compared to other ITIL processes among IT Service Management professionals; and it was also not commonly understood by the management of IT support organizations or their customers either. Not only does the concept of service operation processes require better understanding – i.e. the definitions of "problem", and "incidents", the meaning of the terminologies such as "workaround", "root cause", "request model" ,"process, working instruction and standard operating procedures", "service requests and standard changes" as well as their relationships, but

also do the benefits of these processes, especially that the benefits of the ITIL service operation processes may not be visible immediately and are often long term or future-orientated. After summarizing the views which belong to this category and removing duplicate ones, the following challenge items were listed:

Challenge 16:

Understanding of the processes by IT support teams

- Problem vs Incident
- Service Request model
- Processes, Working instructions and Standard operation procedure
- Workaround vs root cause
- Service request vs standard changes

The Capability of implementing the ITIL Service Operation processes: it was pointed out by the participants that the Implementation capability (i.e. ITIL Implementation project management skill) would be an important condition for the processes to be properly followed or executed within the IT support organization. The Project members' lack of experiences with the implementation of ITIL framework can be explained by the fact that Project Management is usually not considered as part of IT Service Management, and there are other designated methodologies for IT Project Management. After summarizing the views which belong to this category and removing duplicate views, the following challenge items were listed:

Challenge 17:

ITIL implementation experience

- Tailoring capability of the framework to the organizational context
- Process design capability
- Incapable consultants

Challenge 18: Commitment of the project (implementation) team on creating awareness, support and continuous follow up

Challenge 19: delayed implementation: losing momentum

Challenge 20: Project management skill

Challenge 21: ITIL Project team missing the big picture: Dogmatic approach of implementation

Challenge 22: Excluding consultants

Challenge 23: Missing Business staff members as member of ITIL service operation implementation team

Challenge 24: Cascading Balanced score card to ITIL Service operation KPIs

Challenge 25:

Stakeholder management

- Stakeholder expectation and Engagement
- Disconnection between stakeholders and ITIL project team

Table 11 Challenges for implementing the ITIL service operation processes

Challenges for implementing the ITIL service operation processes	**No. Of participants who mentioned**
Resistance to change	4
Breaking the organizational culture	7
Organizational Politics: conflict of interest	4
Top Management support and acceptance	6
ITIL implementation experience • Tailoring capability of the framework to the organizational context • Process design capability • Incapable consultants	7
Availability of Configuration management System and ITSM tools	6
The IT support teams' understanding of the ITIL service operation processes and their benefits	5
Commitment of the project (implementation) team on creating awareness, support, continuous follow up	3

Challenges for implementing the ITIL service operation processes	No. Of participants who mentioned
delayed implementation: losing momentum	6
Implementation Project resource (e.g. budget)	2
Enforcements that oblige to have policies, processes and procedures	1
Project management skill	2
ITIL Project team missing the big picture: Dogmatic approach of implementation	5
Excluding consultants	3
Missing Business staff members as member of ITIL service operation implementation team	2
Cascading Balanced score card to ITIL Service operation KPIs	2
Costly with regard to recruiting consultants: because the framework is derived from other countries experience (very different contexts)	5
The tools used for implementing the ITIL Service operation processes	4
The maturity of other ITIL processes that interact with the ITIL service operation processes	3
Re-works on re-definition of roles and responsibilities of departments, Activity demarcation because of organizational restructuring	5
Process integration	5
Difficulty in integrating the ITIL service operation processes with other frameworks that was implemented in CBE (incident management in ISO 27001 and Crisis management in Business continuity)	2
• Stakeholder management	7

Challenges for implementing the ITIL service operation processes	No. Of participants who mentioned
○ Stakeholder expectation and Engagement ○ Disconnection between stakeholders and ITIL project team	
Too many initiatives down to the stakeholder resulted to framework confusion	3
Understanding of the processes by IT support teams • Problem vs Incident • Service Request model • Processes, Working instructions and Standard operation procedure • Workaround vs root cause • Service request vs standard changes	6

The following are the challenges of ITIL Service operation implementation identified by this study. Summary of theoretical and identified challenges of implementing service operation processes are described in table 12 below.

- **The organizational factors**
    - Challenge 1: Breaking the organizational culture
    - Challenge 2: Resistance to change
    - Challenge 3: Organizational Politics: conflict of interest
    - Challenge 4: Enforcements that oblige to have policies, processes and procedures
    - Challenge 5: Re-works on re-definition of roles and responsibilities of departments, Activity demarcation because of organizational restructuring
    - Challenge 6: Too many initiatives down to the stakeholder resulted to framework confusion
- **The interrelation with other ITIL processes**
    - Challenge 8: Difficulty in integrating the ITIL service operation processes with other frameworks that was implemented in CBE (incident management in ISO 27001 and Crisis management in Business continuity)

- Challenge 9: The maturity of other ITIL processes that interact with the ITIL service operation processes

- **The investment for the ITIL Service Operation Processes**
  - Challenge 11: Costly with regard to recruiting consultants: because the framework is derived from other countries experience (very different contexts)
  - Challenge 13: The tools used for implementing the ITIL Service operation processes
- **The buy-in of the ITIL Service Operation Processes**
  - Challenge 14:The IT support teams' understanding of the ITIL service operation processes and their benefits
  - Challenge 15: Top Management support and acceptance
- **The Capability of implementing the ITIL Service Operation processes**
  - Challenge 17: ITIL implementation experience
    - Tailoring capability of the framework to the organizational context
    - Process design capability
    - Incapable consultants
  - Challenge 18: Commitment of the project(implementation) team on creating awareness, support, continuous follow up
  - Challenge 19: Delayed implementation: losing momentum
  - Challenge 20: Project management skill
  - Challenge 21: ITIL Project team missing the big picture: Dogmatic approach of implementation
  - Challenge 22: Excluding consultants
  - Challenge 24: Cascading Balanced score card to ITIL Service operation KPIs

Table 12 Summary of Theoretical, Identified and Observed Challenges

	Identified & Observed Challenges for implementing ITIL Service Operation processes	**Challenges identified from literature review for implementing ITIL Service Operation processes**

Challenges that are unique	• Resistance to change
	• Breaking the organizational culture
	• Organizational Politics: conflict of interest
	• Top Management support and acceptance
	• ITIL implementation experience
	  ○ Tailoring capability of the framework to the organizational context
	  ○ Process design capability
	  ○ Incapable consultants
	• The IT support teams' understanding of the ITIL service operation processes and their benefits
	• Commitment of the project(implementation) team on creating awareness, support, continuous follow up
	• delayed implementation: losing momentum
	• Enforcements that oblige to have policies, processes and procedures
	• Project management skill
	• ITIL Project team missing the big
		• Support is too reactive
		• Need for better change reporting
		• Not enough time to record support cases
		• SLA breached at the 2nd level
		• No responsible person for service feedback
		• Customers/users have many contact points (not having SPOC)
		• Poorly documented problem sources and procedures
		• Informing Service Desk on problem solutions
		• Lack of unified support practices
		• Service desk workers record several cases under one incident: Lack of rules how to handle reopened cases
		• The lack of guidelines as how knowledge management should interact with ITIL processes

	Identified & Observed Challenges for implementing ITIL Service Operation processes	Challenges identified from literature review for implementing ITIL Service Operation processes
	picture: Dogmatic approach of implementation • Excluding consultants • Cascading Balanced score card to ITIL Service operation KPIs • Costly with regard to recruiting consultants: because the framework is derived from other countries experience (very different contexts) • The tools used for implementing the ITIL Service operation processes • The maturity of other ITIL processes that interact with the ITIL service operation processes • Re-works on re-definition of roles and responsibilities of departments, Activity demarcation because of organizational restructuring • Difficulty in integrating the ITIL service operation processes with other frameworks that was implemented in CBE (incident management in ISO 27001 and Crisis management in Business	• Measurement of service operation processes(e.g. Measurement of incident and problem management)

	Identified & Observed Challenges for implementing ITIL Service Operation processes	Challenges identified from literature review for implementing ITIL Service Operation processes
	continuity) • Too many initiatives down to the stakeholder resulted to framework confusion	
Challenges that are common to both	• Understanding of the processes by IT support teams (Challenges in service operation terminology): Problem vs Incident, Service Request model, Processes, Working instructions and Standard operation procedure, Workaround vs root cause, Service request vs standard changes, Major incident concept unclear (Challenge 16) • Implementation Project resource (e.g. budget): Justifying funding (Challenge 12) • Process Integration: Clarification of the interfaces and relationships among service operation processes and other ITSM processes (Challenge 7) • Stakeholder management o Stakeholder expectation and Engagement, Missing Customer feedback (Challenge 25) o Disconnection between stakeholders and ITIL project team (Challenge 25) o Missing Business staff members as member of ITIL service operation implementation team (Challenge 23) • Availability Configuration management System and ITSM tools (Challenge 10)	

4.6. Ways and methods to overcome the identified challenges

The researcher asked each participant as how the challenges of implementing the ITIL Service operation process can be overcome by IT support organization during the interview to get the participant's insights.

Whilst the participants offered suggestions to overcome challenges in all six categories, most of their answers and responses to this question were surrounding the "The understanding of the ITIL service operation processes", "The Capability of implementing the ITIL Service Operation processes " and "The buy-in of the ITIL Service Operation processes" of the ITIL Service operation process. Most participants held the view that once the challenges in these two areas are successfully overcome, challenges in other areas such as "The investment for the ITIL Service Operation processes", "The interrelation with other ITIL processes" and "organizational factors" could be addressed successfully as natural steps afterwards.

As suggested by the participants, it is essential to achieve the understanding of the objectives and requirements of the ITIL Service Operation Processes as well as how these processes can benefit the IT support organization and its customers. Whilst formal learning such as taking ITIL training courses was generally seen as the preferred method to achieve the understanding, the comprehension of the processes should also be achieved by communications within the IT support organization. The understanding achieved by the organizational communications based on real case scenarios may be more effective than formal learning as such communications can be more constant and more related to the issues that the IT support organization is dealing with. One participant also pointed out that certain tools such as online references or knowledge management functionalities could also assist with the understanding of ITIL processes.
The following are some of the remarks made as the participants offered their suggestions on overcoming the challenge of understanding the ITIL Service Operation Processes:

The understanding of the ITIL service operation processes
"Convince the importance of ITIL services operation to all stakeholders by providing training regularly" *"Persuade the user and managers that the new way, is better way of doing it."* *"Training and development should be given for the implementers and all the managers "* *"There should be more training, more strategic training on how to implement the IT service operation process and other ITIL processes"* *"Build the end-to-end service based (not technology based) view"*

The understanding of the ITIL service operation processes
"trainings with real case scenarios" *"making the ITIL materials accessible with online knowledge management functionalities"* *"Continuous training and awareness creation"* *"Since it is a capability building, it needs continual awareness creation, Training and guidance"* *"Awareness on ITIL should be given for all including business/customers"* *"The service lifecycle have to be understood by the IT support teams through continuous training"*

In addition to the formal learning such as taking ITIL training courses, Project management trainings are seen to be important for the implementers. Involvement of business teams, benchmarking companies for their successful implementation or recruiting consultant are some of the additional recommendations given.

The following are some of the remarks made as the participants offered their suggestions on overcoming the challenge on Capability of implementing the ITIL Service Operation processes:

The Capability of implementing the ITIL Service Operation processes
"Project management trainings" *"Benchmarking "* *"Prepare a mitigation strategic plan. Environmental analysis should be conducted"* *"Review the processes: through continues assessments and discussion"* *"Work on Cultural change"* *"Involvement of Business experts as a project team member"*

The buy-in of the ITIL Service Operation Processes from the internal IT support teams, the management of the IT Support organization and also the customers are seen by the participants as crucial challenges. To overcome the buy-in challenge, some participants held the view that not

only the understanding of the ITIL Service Operation Processes is required, but also real-life examples or quantifiable data are also needed to show how these processes work as well as the results and the benefits these can bring. In terms of seeking buy-in from the customers, IT professionals such as Service Delivery Managers were believed to be able to assist.

The following are some of the comments made as the participants were offering suggestions to meet the buy-in challenge:

The buy-in of the ITIL Service Operation processes
"Let the management know the deliverables on regular basis" *"Monitor the processes if they are being done as per the procedure "* *"Motivate, award the users and managers those who follow the procedure and even punish the ones that resist"* *"Present the values/in figures/ to the management"* *"Involving Top management in the process of implementation of the project"* *"It should be worked on the organizational culture"* *"The framework is derived from other countries experience: to avail budgets and recruit consultants is necessary"* *"work on top management awareness, not to lose their momentum"* *"Taking considerations of Enterprise architecture and IT Governance"* *"Recruit Implementation consultant/Expertise"* *"IT support organization should Build master framework: Mesh/blend your own framework"*

Throughout the interviews, the communications within the IT support organization and the communications with the customers were highlighted as the method to overcome not just the "The understanding of the ITIL service operation processes", "The buy-in of the ITIL Service Operation processes" and "The Capability of implementing the ITIL Service Operation processes" challenges, but also the challenges in other categories. During the interviews, most participants also expressed the view that the implementation of the ITIL Service Operation processes would require the drive from the top of IT support organization; a top-down approach was seen by many participants as being required to show the vision and direction, create the

momentum, provide resources, specify the steps, and foster an appropriate organizational culture and environment for the implementation of the ITIL Service Operation process.

4.7. Critical Success Factors to the Implementation of ITIL Service operation

The researcher asked each of the participants the fourth questions to get their insights on the Critical Success Factors associated with the implementation of the ITIL Service Operation Process. Table 13 describes the identified critical success factors of ITIL Service operation implementation.

Table 13 Identified and observed CSFs to the Implementation of ITIL Service Operation Processes

Critical Success Factors for implementing the ITIL service operation processes
ITIL Service operation processes implementation project budget
Top Management involvement in the Implementation project (as a member)
Process Performance Assessment (Pre-implementation, during and post-implementation)
Clear and measurable implementation goals
Stakeholder management
Prioritization of Process implementation
Implementation Project members ITIL implementation experience
Organizational structure of the IT support organization
Top management sponsorship and support
Organizational culture
IT Governance
Measurement of the levels of capabilities that the stakeholders achieved
Project management skill

Critical Success Factors for implementing the ITIL service operation processes
Demarcated activities among the departments and support levels
Process integration
Maturity of Service Level Management process, Service Catalogue Management process, Information Security Management process, Change Management process, Service Asset and Configuration Management process, Knowledge Management Process, and Early life Support Process
Existence of ITSM tools

The following are the CSFs of Service operation implementation identified by this study.

Summary of Theoretical and Identified CSF of implementing service operation processes are described in table 14 below.

- ITIL Service operation process implementation project budget
- Top Management involvement in the Implementation project (as a member)
- Stakeholder management
- Prioritization of Process implantation
- Implementation Project members ITIL implementation experience
- Organizational structure of the IT support organization
- Organizational culture
- IT Governance
- Measurement of the levels of capabilities that the stakeholders achieved
- Project management skill
- Demarcated activities among the departments and support levels
- Process integration
- Maturity of Service Level Management process, Service Catalogue Management process, Information Security Management process, Change Management process, Service Asset and Configuration Management process, Knowledge Management Process, and Early life Support Process

Table 14 Summary of Theoretical, Identified and Observed CSFs

	Identified & Observed CSFs for implementing the ITIL service operation processes	**Critical Success Factors for implementing the ITIL service operation processes**
Unique item	• ITIL Service operation process implementation project budget • Top Management involvement in the Implementation project (as a member) • Stakeholder management • Prioritization of Process implementation • Implementation Project members ITIL implementation experience • Organizational structure of the IT support organization • Organizational culture • IT Governance • Measurement of the levels of capabilities that the stakeholders achieved • Project management skill • Demarcated activities among the departments and support levels • Process integration • Mature Service Level Management process, Service Catalogue Management process, Information Security Management process,	• Business support • Implementation Champions • Staffing and retention • Service management training

	Identified & Observed CSFs for implementing the ITIL service operation processes	Critical Success Factors for implementing the ITIL service operation processes
	Change Management process, Service Asset and Configuration Management process, Knowledge Management Process, and Early life Support Process	
Common item	• Top management sponsorship and support • Existence of ITSM tools • Process Performance Assessment (Pre-implementation, during and post-implementation) • Clear and measurable implementation goals	

Chapter Five: Discussion, Conclusions and Recommendations

This chapter summarized the discussion of results, conclusion, and recommendations made.

5.1. Discussion

5.1.1. The Capability of Implementing the ITIL Service Operation Processes

Managing stakeholders when implementing service operation processes by taking the stakeholder considerations and queries into perspective and making them feel comfortable is one capability required from the implementers. Implementers lacking experience with ITIL and ITSM is mentioned by the interviewees. This means that not only implementers must have good knowledge of ITIL before starting implementation of the new processes but also project management knowledge. This result confirms the same proposition as seen in much of the existing literature for the implementation of the ITIL framework: Vaitha and Francis (2016), ITIL and COBIT complement each other and if used together, they contribute to a higher value; and following the project management principle for ITIL implementation as described by Rice (2020) and Assad & Ahmed (2015) helps Implementers conducting the implementation project for required success.

Skills are also required to tackle how employees in an organisation react to certain situations and monitoring and evaluation of the implementation process concerns how an organisation should keep a check on the progress of the implementation. In addition, communication and cooperation strategy within the organisation should be devised that help clarify the internal interaction between the different departments and how they communicate with each other on the issues at hand. Competence of involved stakeholders in ITIL should be assessed and trainings should be organized as per the assessment results.

5.1.2. The management buy-in, understanding and support for the ITIL Service Operation Processes

This research concluded that the buy-in and support from the management of the IT support organization is one of the most crucial and influential elements for the implementation of the ITIL service operation processes. This result confirms the same proposition as seen in much of the existing literature for the implementation of the ITIL framework. By both the literature review and the research, the understanding of the ITIL processes, the value provided by the processes and the customer buy-in are regarded as the essential elements to obtain the support from the management. Management support is believed to be able to pave the way for finance and resource commitment, provide the processes with more recognition and status and influence the entire organization to follow the processes. However, the management support for implementing the ITIL service operation processes becomes a challenge if the processes are not well understood, not commonly implemented or unable to clearly demonstrate the value it can add to the management and delivery of the IT services. With less management support, the processes are less likely to be implemented properly and more likely to produce poor results. It was suggested by the literature review that often a quick win can be taken as a solution. The quick wins can be understood as the realization of the benefit of the ITIL processes by implementing them initially in the most ideal conditions. By achieving quick wins, even without completing the entire implementation, the ITIL service operation processes may build up more management support which would allow the processes to be further established and interrelated with other existing ITIL processes.

The management support for the ITIL service operation processes in IT Service Management and delivery may also be achieved by an increase of customer satisfaction as the result of the implementation of these processes. The customers' business priority and their genuine interest in knowing the underlying issues in their IT operations could play an important part in winning customer satisfaction and also increasing the demand for the ITIL service operation processes.

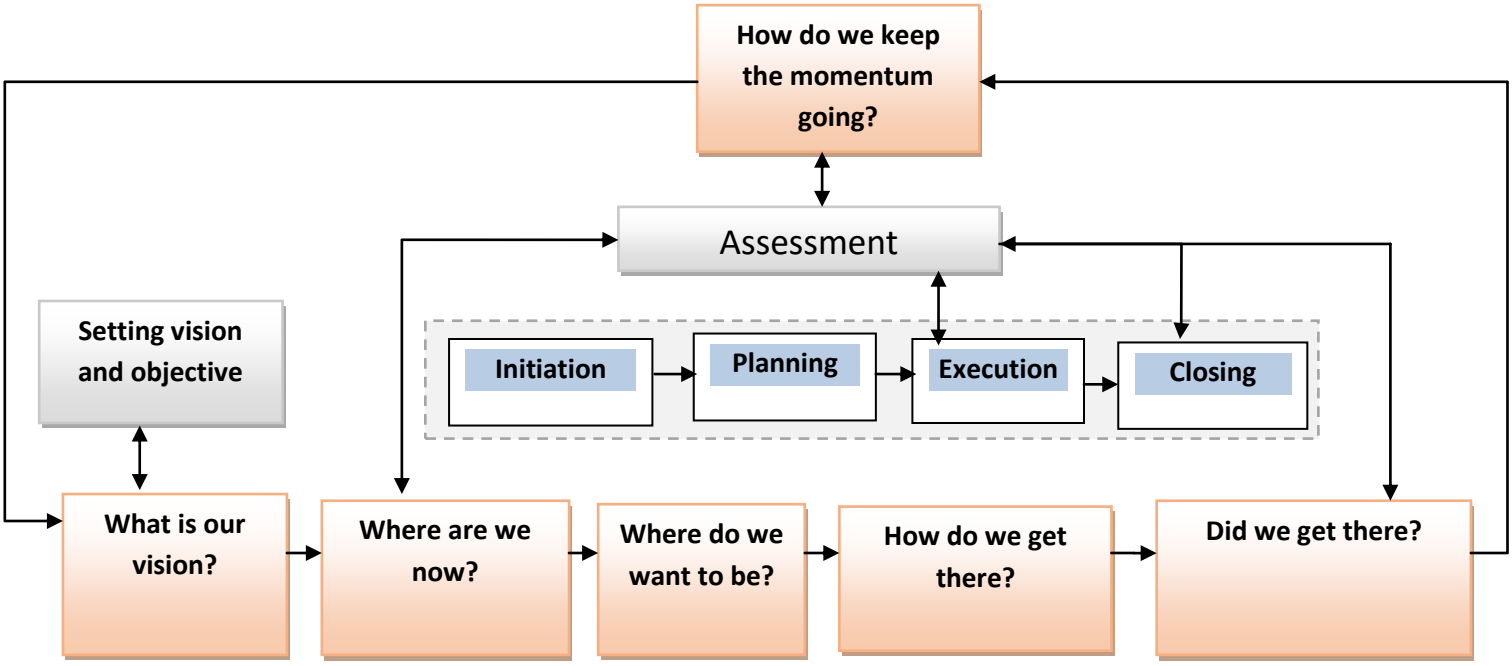
Although it may appear that there is nothing too difficult for IT professionals and users to understand the principle of ITIL service Operation processes and its objectives and benefits, a few issues may just cause confusions. As described by Jantti (2008), ITIL terminologies were not widely or traditionally used in IT industry. This was particularly the case for terminologies such

as problem or incident. For instance, in the ITIL dictionary, problem means the underlying cause for one or more incident which is highly specific and is almost incompatible with how it is generally used in everyday life. Known error as an ITIL terminology also does not simply mean that the error is well known or documented, but specifically for an underlying issue which has a documented root cause and a workaround. Not just the terminologies such as problem, known error or incident that may cause confusions, as pointed out by the literature review, "the lack of practical example to follow" may also cause challenges to the understanding of ITIL processes. As a result, the understanding of the ITIL Service Operation process may often be hindered by the gap between the specific meanings of its terminologies and how the same words are used in daily lives; the understanding may be further prevented by the lack of the communications of real-case scenarios in daily IT service operations to show what a Problem, Incident, Request, Access, Event, Procedures and Working instruction really are according to its ITIL definition. Due to these, it would certainly require not just formal learning and education, but also constant communications to ensure the correct and consistent understanding and speaking common language of the ITIL service operation processes by all parties involved and the tools used.

5.1.3. The ITIL Service Operation processes implementation strategy

Based on the findings and analysis, a guideline to overcome the ITIL service operation implementation challenges is proposed. It is proposed that the ITIL service operation implementation should be carried out following approaches of the CSI and project management. Implementation of new processes requires change and it may affect both internally (employees) and externally (customers). To propose the guideline, it is used generic project management model given by Assad & Ahmed (2015) and CSI Approach (OGCe, 2011).

Figure 8 ITIL Service Operation Implementation



What is the vision? The question should be asked by the IT service provider to understand what the ultimate and long term aims are. It provides a clear focus for the implementation and gives a sense of direction for all stakeholders involved in the project to rally around and it helps to bring them together around a common objective.

Where are we now? The question should be asked by the IT service provider to identify the gap that exists between the current state and the desired future state. After the current state assessment is done, initiation phase of the project should be started which includes conducting feasibility study activity on the ITIL service operation processes.

Where do we want to be? This is often expressed as requirements and should provide demonstrable benefits to IT and, more importantly, to the business. Implementers can also continue with the planning step of the project. All required resources must then be acquired and allocated.

How do we get there? The question should be asked by the IT service provider to identify the improvement initiatives are required in the short, medium and long term. These initiatives should be logged in the CSI register at both the planning and execution phases of the project.

Did we get there? This is documented through measurements and metrics. Conducting current state assessment and closing the project if the requirements met will then follow.

Assessments take place to benchmark the current state. Benchmarking often reveals quick win opportunities for improvement that are relatively easy and inexpensive to implement while providing substantial benefits in process effectiveness, cost reduction or staff synergy. Since implementing service management can be a lengthy program of change, keeping the momentum going can be achieved by having quick wins. It is important that, during the project, short-term wins are realized and communicated. Short-term wins help to keep a change effort on track and to keep the energy and commitment levels high.

5.2. Conclusion

ITIL is the most famous framework for IT Service Management. But there is less information available which assist organizations in the successful implementation of ITIL. There are many challenging factors that need to be managed for the desired outcome. In this research, a single case study methodology was applied. Data was collected through document analysis, semi-structured interview and direct observation. Interviewees were selected based on their ITIL certification level and exposure to ITIL. This study began with a broad perspective towards the use of ITIL in organisational life and reviewed the relationships between organisational IT governance, Enterprise Architecture, Quality Management, Project Management, IT Service Management and their associated concepts and frameworks. Among the studies of ITIL as the IT Service Management framework, this study is one of the very few which focuses on the implementation of its individual lifecycle processes. It also made an effort to gather insights and views towards the ITIL framework and the ITIL Service Operation processes from the IT professionals who routinely worked with them. Despite the overall positive views towards the ITIL framework and the Service Operation processes, this study found that that their successful implementation by the IT support organisation is seen as crucial for realising their benefits. This study first summarized the challenges and critical success factors that the implementation of the ITIL Service Operation processes may encounter according to existing literature.

This study has focused on the exploration of influencing factors that act as challenge and CSFs to the implementation of ITIL service operation processes in CBE. As a result, nineteen unique challenges and thirteen Critical Success Factors that may impact the successful implementation of these processes have been identified. The challenges identified during this study were:

- The organizational factors
    - Breaking the organizational culture
    - Resistance to change
    - Organizational Politics: conflict of interest
    - Enforcements that oblige to have policies, processes and procedures
    - Re-works on re-definition of roles and responsibilities of departments, Activity demarcation because of organizational restructuring

    - Too many initiatives down to the stakeholder resulted to framework confusion
- The interrelation with other ITIL processes
    - Difficulty in integrating the ITIL service operation processes with other frameworks that was implemented in CBE (incident management in ISO 27001 and Crisis management in Business continuity)
    - The maturity of other ITIL processes that interact with the ITIL service operation processes
- The investment for the ITIL Service Operation Processes
    - Costly with regard to recruiting consultants: because the framework is derived from other countries experience (very different contexts)
    - The tools used for implementing the ITIL Service operation processes
- The buy-in of the ITIL Service Operation Processes
    - The IT support teams' understanding of the ITIL service operation processes and their benefits
    - Top Management support and acceptance
- The Capability of implementing the ITIL Service Operation processes
    - ITIL implementation experience
        - Tailoring capability of the framework to the organizational context
        - Process design capability
        - Incapable consultants
    - Commitment of the project(implementation) team on creating awareness, support, continuous follow up
    - Delayed implementation: losing momentum
    - Project management skill
    - ITIL Project team missing the big picture: Dogmatic approach of implementation
    - Excluding consultants
    - Cascading Balanced score card to ITIL Service operation KPIs

In addition, the CSFs Identified from this study were:

- ITIL Service operation process implementation project budget
- Top Management involvement in the Implementation project (as a member)
- Stakeholder management
- Prioritization of Process implantation
- Implementation Project members ITIL implementation experience
- Organizational structure of the IT support organization
- Organizational culture
- IT Governance
- Measurement of the levels of capabilities that the stakeholders achieved
- Project management skill
- Demarcated activities among the departments and support levels
- Process integration
- Maturity of Service Level Management process, Service Catalogue Management process, Information Security Management process, Change Management process, Service Asset and Configuration Management process, Knowledge Management Process, and Early life Support Process

The researcher proposed guidelines for the ITIL service operation processes implementation which are based on the challenges identified. IT support organizations must consider these factors before, during and after the implementation of ITIL processes. Proposed guideline is developed using generic project management model and CSI approach. Implementing ITIL service operation processes using the proposed approach will assist implementers to follow and consider all important factors in a structured way.

This study also highlights the effective Implementation Project management, continuous ITIL trainings with real case scenarios, assessments and quick wins as a key method to overcome challenges identified in each category and particularly to promote the understanding and implementation capability, increase the buy-in and foster a strong organisational culture that would enable the ITIL Service Operation processes to achieve their full potential. The careful setting of clear objectives, current state assessments and benchmarking along with cautious planning and execution of ITIL Service operation projects are recommended by this study to be

the center of any strategies designed to implement the ITIL Service Operation processes within the IT support organizations.

5.3. Recommendation for future research

The empirical research of this study was conducted with IT professionals from one single IT support organization. The fact that the ITIL framework is well regarded and actively followed by this organization and its employees, can be beneficial to this research but may also prevent alternative views. It is therefore recommended that the empirical research of this paper is replicated at different organizational environments in the future. It is also necessary for the challenge items and their categories presented by this paper to be quantitatively examined in order to shed further lights on their relationships and associations. The guideline recommended by this paper for implementing the ITIL service operation and overcoming the associated challenges should also be quantitatively verified.

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Appendix

Semi- Structured Interview outline

Source: Adopted from (Alemeye, 2015)

Alemeye Seyfe (2015). *Factors influencing the implementation of it service management framework in telecom companies: A case study in EthioTelecom.* Addis Ababa: Addis Ababa University.

It is intended to conduct the interviews face-to-face. All interviews will be held on the premises of CBE.

Interview guide for interviewing ITIL Implementation Project Team members

Q1. How did you start to involve in CBE ITIL implementation process?

- What are your experiences of working with ITIL, what are your views and opinions about it?
- What are your views and opinions about its implementation?
- What are your experiences of working with ITIL?
- How did CBE start to implement ITIL?
- After assigned as a project member, what were your main responsibilities?
- How did CBE go through the ITIL implementation process?
- How was your ITIL process implementation approach?

Q2. What is your view towards the ITIL Service Operation Processes in particular?

- What is your view towards the ITIL Service Operation Processes implementation?
- Incident Management process
- Event Management process
- Problem Management process
- Request fulfilment process
- Access Management process

Q3. From your experience of ITIL implementation in CBE, what are the challenges to successful implementation of ITIL Service operation processes?

- What do you understand by Challenges?
- Can you give me an instant of a challenge/s?
- Why do you call them challenges?
- How did they damage or hurt the ITIL Service Operation Processes Implementation outcome?
- How do you think overcome the challenges of implementing ITIL Service Operation Processes?

Q4. What factors do you think are vital or decisive for the successful implementation of ITIL Service Operation Processes?

- What do you understand by critical success factor?
- Why do you call them critical success factor?
- How did they influence the ITIL Service Operation Processes implementation outcome?
- Can you give me an instant of critical success factor to the implementation of ITIL?

Interview guide for interviewing IT Staffs

Q1. How did you start to involve in CBE ITIL implementation process?

- What are your experiences of working with ITIL, what are your views and opinions about it?
- What are your views and opinions about its implementation?
- What were your main responsibilities with respect to the ITIL implementation and Service operation processes in particular?

Q2. What is your view towards the ITIL Service Operation Processes in particular?

- What is your view towards the ITIL Service Operation Processes implementation?
    - Incident Management process
    - Event Management process
    - Problem Management process
    - Request fulfilment process
    - Access Management process

Q3. From your experience of ITIL implementation in CBE, what are the challenges to successful implementation of ITIL Service operation processes?

- What do you understand by Challenges?
- Can you give me an instant of a challenge/s?
- Why do you call them challenges?
- How did they damage or hurt the ITIL Service Operation Processes Implementation outcome?
- How do you think overcome the challenges of implementing ITIL Service Operation Processes?

Q4. What factors do you think are vital or decisive for the successful implementation of ITIL Service Operation Processes?

- What do you understand by critical success factor?
- Can you give me an instant of critical success factor to the implementation of ITIL?
- Why do you call them critical success factor?
- How did they influence the ITIL Service Operation Processes implementation outcome?