The Effectiveness of Management of Lessons Learned from Botswana Tourism Organisation (BTO) Projects

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Statement of Originality

This work contained in this Dissertation was carried out by the author at the University of Botswana, between May 2018 and March 2019. It is original work except where due reference is made and neither has been nor will be submitted for the award of a degree by any other university.

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Abstract

Learning from past projects, be it to make the most of good practice or to avoid repetition of past mistakes, is one of the major success factors for continuous project accomplishment in organisations. Many researchers and project management practitioners underscore the need for organisations to effectively manage project learning, to ensure that organisations' harvest lessons and apply them for the improvement of subsequent projects. That notwithstanding many organisations do not benefit from project learning, either because they do not have clear project learning processes in place, or the processes are not effectively implemented. Botswana Tourism Organisation (BTO) is one organisation that executes part of its mandate through the execution of construction projects in partnership with identified communities. This research embarked on assessing the effectiveness of the management of lessons learned by BTO for its construction projects. The research is a case study of five (5) projects that BTO has constructed since the organisation was established. The research was undertaken through a detailed review of the projects 'documentation, distribution of questionnaires, follow-up interviews as well as focus group discussions with selected respondents. The results were analysed using various statistical, including rubric assessments, and non-statistical methods. The findings suggest that management of lessons learned for the projects is largely ineffective since some lessons learned processes i.e. capturing, storage and dissemination are minimally developed, while other processes i.e. analysis and infusion are virtually non-existent. Recommendations on key processes to be improved as well as key success factors for improvement have been put forth.

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List of Abbreviations

BTO	- Botswana Tourism Organisation
BDE	- Boeing Designated Expert
CoP	- Communities of Practices
LL	- Lessons Learned
MENT	- Ministry of Environment Natural Resource Conservation and Tourism
PMBOK	- Project Management Body of Knowledge
PMI	- Project Management Institute
PPR	- Post Project Reviews
PRINCE2	- Projects in a Controlled Environment
UAE	- United Arab Emirates

CHAPTER 1: INTRODUCTION

1.1 Preamble

The research investigated the Effectiveness of Management of Lessons Learnt from the Botswana Tourism Organisation (BTO). Many organisations including BTO deliver their mandate through delivering projects. The highly competitive nature of the business landscape compels organisations to continuously improve their performance in delivering the projects. Research has shown that projects can provide good lessons that organisations can use to improve on future projects to advance their competitiveness, however, many organisations hardly reap the intended benefits of the LL to benefit future projects for various reasons. Experts, practitioners, and authors in the project management fraternity have suggested best practice for LL to ensure optimal project delivery. This research sought to compare BTO's LL processes with established best practice. The research explored in detail the concept of lessons learned as discussed by many authors, compared BTO's processes with best practice, in a bid to recommend remedial strategies that can bridge the gap between BTO's status quo and current best practice.

The report is organised into five chapters, the Introduction, Literature Review, Methodology, Data Analysis, and Conclusions and Recommendation. This chapter is the first chapter of the reports and gives insight into the research background, objectives and intended purpose of the study.

1.2 Research Background

1.2.1 Project Management

PMI (2013) defines a project as a temporary endeavor, with a definite beginning and end, undertaken to create a unique product, service or result. PMI (2013) further contends that project management is accomplished through the application and integration of five management processes also known as process groups i.e. initiation, planning, execution, monitoring and controlling and finally closing. Management of lessons learned is part of the closing process.

1.2.2 Lesson Learned Processes

Project management processes are a set of interconnected activities executed to deliver a project. PMI (2013) describes these process groups as initiating, planning, execution, monitoring and evaluation, and closing. Initiating processes are defined as those undertaken to define what the project is intended to achieve; planning processes encompass making decisions on how to deliver the project; execution processes are performed to complete the work defined in the project plan; monitoring and evaluation processes are concerned with regularly measuring and monitoring progress of the project to ensure adherence to plan and; closing processes are concerned with completion up of the project. Larson and Gray (2011) sum up project closing processes as comprising three key components which are wrapping up the project, the major task of which is to ensure the project is approved and accepted by the customer; evaluation of performance and management of the project and; management of lessons learned.

The interest of this research was on the management of lessons learned. Lessons learned as acknowledged in the project management landscape across the globe are an indispensable instrument in project delivery as it is through experiences of past projects that improvement on future projects can be accomplished. However, despite the immense value, most organisations still do not reap the fruits of lessons learned from projects for various reasons inter alia, not conducting project reviews at all or if reviews are done there is no understanding of what went wrong and why (Williams, 2007); managers not prioritising lessons learned due to time and budgetary constraints (Wysocki, 2014); as well as using inappropriate methods and tools for managing the lessons learned. There are many strategies for effectively reaping the fruits of lessons learned from projects. The overall effectiveness of the lessons learned depends on how the organisation maximises on the processes of capturing, analysing, storing, disseminating and infusing the lessons learned. For purposes of this research, capturing, analysing, storing, disseminating and infusion of lessons learned will be collectively referred to as management of lessons learned.

1.2.3 BTO Background

The case study for the research was Botswana Tourism Organisation (BTO), a parastatal organisation in The Ministry of Environment, Natural Resource Conservation and Tourism (MENT). BTO was established, as a body corporate, through an Act of Parliament, The BTO Act No. 14 of 2009, with a mandate to market and position Botswana as a premier tourist destination, promote investment in the

tourism sector, and to grade and classify tourist facilities in the country. More specifically BTO is mandated to undertake strategic initiatives including the following:

i. To plan, develop and implement tourism marketing and promotion strategies aimed at creating and sustaining a positive image of Botswana as a tourist and investment destination;
ii. Plan, formulate and implement strategies for promoting sustainable tourism development in collaboration with the private sector in the tourism industry, local authorities, local communities, and non-governmental organisations;
iii. Promote the improvement of existing tourism enterprises and service standards;
iv. Develop and improve the existing tourism opportunities and diversify the sector to include other forms of tourism;
v. To select, develop and bring to the required marketable standard, any tourism project solely or through partnerships with any community-based organisations or any individual.

In line with its strategic intent to select, develop and bring to the required marketable standard any tourism project, BTO through its Investment Promotion and Product Development Department, has developed five projects in partnership with local communities and is intent on identifying and developing more projects across the country (BTO, 2015): Lepokole Nature Reserve project is a partnership between BTO and the Lepokole community in the Central District and it features the Lepokole hills rock paintings and caves, curio shop, camp sites, and walking trails; Tsabong Ecotourism Camel Park was developed in partnership with Tsamama Trust, a community representing the villages of Tsabong, Maubelo, and Maleshe in the Kgalagadi District and it offers accommodation (six luxury meru tents and camp sites), camel rides and quad biking; Goo-Moremi Resort was developed in partnership with Moremi Manonnye Community Trust in the Tswapong Area and it offers accommodation (six chalets and five campsites), curio shop and guided nature walks to the gorges; Seboba Nature and Recreational Park was developed in partnership with Seboba Conservation Trust, a representation of the Kasane community, and it offers tourist information services, curio shop, performance arena, picnic sites, walking trails, bird viewing, and cultural village; Qcwihaba and Koanaka Caves was developed in partnership with the Qcae Qcae Tlhabololo Community Trust in Ngamiland and it offers camp sites, cultural village, and cave expeditions.

The projects were developed between 2012 and 2015 and they were all delivered using established project management processes. There are indications that delivery of such projects in the organisation is more often than not characterised by cost and time overruns as well as quality issues. There is no suggestion that there is effective learning from previous projects as subsequent projects appear to be delivered using the similar processes and are marred with the similar cost overruns, delays, and quality issues, and this could be in part due to not effectively harnessing lessons learned from previous projects to improve on future projects.

1.3 Problem Statement

BTO as an organisation that delivers part of its mandate through project delivery needs to continually improve its project processes to achieve its competitive edge and relevance. The organisation has executed five (5) construction projects thus far. It is common knowledge that project success can be achieved through project learning, and retrospectives of a lesson learned are an invaluable source of such project learning. It is not known however, if BTO has effectively managed lessons from these projects to improve on future projects.

1.4 Research Question and Objectives

This research sought to answer the following question:

"How effective are the processes used in managing lessons learned from projects at BTO?"

To answer this research, question the following objectives were pursued:

1. To determine the processes used in managing lessons learned from projects at BTO.
2. To determine the adequacy of the processes above as compared to best practice.
3. To develop a framework for the management of lessons learned from projects at BTO.

1.5 The scope of the Project

The focus of the research was on lessons learned processes, particularly those concerned with capturing, analysing, storing, disseminating and infusing the lessons. BTO has several departments, each with its own mandate aligned to that of the organisation as expressed in The BTO Act. This research focused on the community projects completed by the Department of Investment and Product Development from inception to date as discussed in 1.2.2 above.

1.6 Usefulness of the Findings

The research findings will go a long way in assisting the department in reaping the benefits of lessons learned from projects to strengthening execution of future projects, particularly in view of the fact that the department executes its mandate mainly through projects. The findings and recommendations can also be simulated and applied to projects undertaken by other BTO departments so that the organisation achieves holistic efficiency.

1.7 Chapter Summary

This research set out to probe the lessons learned processes used by BTO in its tourism construction projects, with a view to compare the processes to best practice. The findings have determined the processes gaps upon which a suitable lesson learned framework will be proposed. It is anticipated that the proposed framework will greatly enhance project learning to improve future project delivery in the organization. Having put forward the background of the research, the subsequent chapter outlines the literature reviewed in order to establish lessons learned best practice.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The definition of a project as enunciated in the project management landscape culminates in two fundamental principles of it being a temporary undertaking, and it delivering a product that an organisation requires or meeting a defined objective. Delivery of such products is only conceivable if project management is effective. Effective project management, on the other hand, is also plausible through application and integration of certain management processes, one of which is effective management of lessons learned (LL). This chapter provides detailed insight into this effective management of LL in the following outline: project management; LL processes. Furthermore, the chapter suggests a conceptual framework of LL.

2.2 Project Management

In this section, the concepts of project and project management will be discussed, by way of background.

PMI (2013) defines a project as a temporary endeavor, with a definite beginning and end, undertaken to create a unique product, service or result.

Project Management, on the other hand, can be defined as planning, organizing, directing and controlling of company resources for a relatively short-term objective that has been established to complete specific goals and objectives (Kerzner, 2009 as cited by Paul, 2015). PMI contends that project management is accomplished through the application and integration of five management processes known as process groups i.e. initiation, planning, execution, monitoring and controlling and finally closing. Larson and Gray (2011) sum up project closing as three key components, which are wrapping up the project, the major task of which is to ensure the project is approved and accepted by the customer; evaluation of performance and management of the project and; retrospectives of lessons learned. This research focuses on the lessons learned component of the closing process.

2.3 Lessons Learned Processes

This section discusses the fundamental processes of LL management as enunciated by various authors.

Various synonyms for lessons learned have been used in the project management landscape. Jugdev (2012) states some of the commonly used synonyms are Post Project Reviews (PPRs), project assessments, project reviews, project completion audits, post mortems, appraisals, after-action reviews, debriefings, and post-implementation evaluations. It should be noted however that all these different synonyms have the same basic connotation, that is, an analysis carried out during and shortly after the project life cycle as an attempt to capture positive and negative project learning.

Lessons Learned can be defined as knowledge gained from experience, successful or otherwise, for the purpose of improving future performance (Construction Industry Institute, 2007 as cited by Ferrada et al, 2015). Davenport and Prusak (2000) as cited by Duffield and Whitty (2012, p. 2) further define knowledge as:

> *"… a fluid mix of framed experiences, values, contextual information and expert insights that provides a framework for evaluating and incorporating new experiences and information…".*

Schindler and Eppler (2003) view Lessons Learned as key project experiences that have certain general business relevance for future projects, have been validated by a project team, and represent a consensus on a key insight that should be considered in future projects. Along the same breadth, Altuğ (2002) as cited by Elinfoo (2017) views lessons learned as a means of organizational learning for future benefits and as a problem-solving cycle done after project closure. Secchi (1999) as cited by Weber *et al* (2000 p. 63) have defined lessons learned as:

> "…knowledge *or understanding gained by experience. The experience may be positive, as in a successful test or mission, or negative, as in a mishap or failure...A lesson must be significant in that it has a real or assumed impact on operations; valid in that is factually and technically correct; and applicable in that it identifies a specific design, process, or*

decision that reduces or eliminates the potential for failures and mishaps, or reinforces a positive result".

Lesson learned are an indispensable process whose value has been acknowledged by many authors. If done diligently, they do not only provide valuable insights which can help ongoing projects, they also prove critical to the successful planning of future efforts (Ilyas, Hassan, and Ilyas (2014). Gasik (2011)'s view is that lessons learned increase not only the capabilities of the projects that perform them but also the capabilities of the whole organization. The key learning from these views is that lessons learned provide an opportunity for reflecting on how the project was done, in order to learn how things can be improved in future undertakings. This purpose of lesson learned is neatly summed by Wysocki (2014, p. 627) as answering the following questions:

a) *Was the project goal achieved?*
b) *Was the project work done on time, within budget, and according to specification?*
c) *Was the client satisfied with the project results?*
d) *Was business value realized?*
e) *What worked? What didn't?*

Wysocki (2014, p. 306) notes that the answers to the above questions are helpful hints and suggestions for future project managers and teams because "experiences of past project teams are real "diamonds in the rough" which need to be passed on to future teams. He further notes with concern that post-implementation audits are seldom done, which is unfortunate because it has great value for all stakeholders.

The fundamental principle for Lessons Learned is learning from past experiences to improve on future undertakings, regardless of the type of project. As noted by Lazar (2014) LL is a trigger for change as the usual aim of LL is to introduce an improvement, changing an unsatisfactory situation most of the time, and developing new capabilities for the organization to improve their working and operational processes. This is consistent with Schindler and Eppler (2003)'s notion that construction companies conduct LLs is to learn from similar past projects to avoid repeating mistakes, to ensure that past successes are replicated in future projects, to gain a competitive edge over companies, to avoid corporate brain drain, and to encourage innovation.

The process of lesson learned is conceptualized as commencing from individuals, groups and finally spreading in the organization (Eliufoo, 2017). The perception is that individuals involved in a project to learn from experience; pass on the learning to other people in the organization and learning ultimately achieved at the broader organization level.

For successful harvesting of Lessons Learned there must be a systematic process. There is no universal approach to obtaining Lesson Learned; however, some degree of commonality does exist in project management literature. Dülgerler, and Negri (2016) believe for an Organisation to truly learn a lesson, there needs to be three ingredients: an experience to learn from (by observation or by direct participation); a pattern of doing things in similar situations; and a goal to improve something. These Lessons Learned ingredients are interpreted to represent the project (which provides the learning experience), Lessons Learned processes and the goal to achieve efficiency in future projects. Eliufoo (2017) views organizational learning as a process that captures and processes experiential knowledge for enhancement of future projects. Argote, 2013 as cited by Eolifu, 2017 describes it as a process of creating, retaining and transferring knowledge occurring from organization experience. Jugdev (2012, p. 13) describes organizational learning as a "way of transferring valuable project knowledge-the good, the bad and the ugly, it involves sharing knowledge about the elements of specific project phases that went according to plan, the parts that could be improved on and plans to address these issues before moving on to the next phase" . Senge (1990) as cited by Cooke, Dunscombe, and Lee (2007) in the same sentiment express that a learning organisation is one that actively creates, captures, transfers and mobilises knowledge to enable it to adapt to a changing environment.

A synthesis of literature suggests five fundamentals processes in the Lessons Learned landscape: collection/ capturing, analyzing, storing, disseminating and infusing lessons learned:

2.3.1 Capturing LL

Capturing lessons is concerned with obtaining feedback on what went right, what went wrong and what needs to be improved during project delivery (Rowe, 2007). Walker (2008) in concurring with this notion notes that the key elements to be captured in LL are what went right, what went wrong and what needs to be improved.

The process of capturing lessons as elaborated by Wysocki (2014) involves evaluation of the project processes, project deliverables, project team, individual team members, and project manager to determine if the project's goals have been achieved as measured against the project plan, budget, time deadlines, quality of deliverables, specifications, and client satisfaction. According to Piantanida et al (2010), it is important to capture both successes and failures on projects so that future projects can benefit by following the lessons learned that were successful and avoiding the failed lessons. The paramount deduction one can make is that both negative and positive occurrences need to be captured as they can both provide some form of learning. Despite the value of capturing both successes and failures in project learning, as correctly noted by Trevino and Anantatmula (2008) project team members often do not have a problem with talking about project successes, but they do often downplay negative feedback because people tend to take the failed experience personally and relate to it with emotional pain.

It is critical for project managers to determine the method of capturing lessons learned to ensure that capturing of the lessons is systematic and not done in an ad hoc fashion. According to Trevino and Anantatmula (2008) as a first step, organizations must define the lessons (the type and the content) they need to capture and then identify the specific knowledge areas that relate to their efforts for improving project management practices and processes. Along the same breadth, Rowe and Sikes (2006) also note that the lessons learned process should start with identifying comments and recommendations (type and content as referred to by Trevino and Anantatmula, 2008) that could be valuable for future projects. Rowe (2007) further suggests that the type and content for the lessons could include scope, time, cost, quality, human resource, communications, risk, and procurement; or the process groups: initiating, planning, executing, monitoring and controlling and closing.

Capturing LL involves identifying and capturing the lessons using a variety of tools and methods. Disterer (2002) and Kartam (1996) as cited by Graham and Thomas (2010) note that such tools include post-project reviews, audits, and debriefings. Vandeville & Shaikh (1999) and Tautz al. (2000) as cited by Weber *et al* (2000) suggest that lessons can also be obtained through interviews with the project teams. In some instances, passive collection methods wherein organization

members submit their own lessons using a form can also be used. Weber *et al*. (2000) contend that the Center for Army Lessons Learned (CALL) in Washington DC has an excellent passive collection form with online help and examples. All these are some form of evaluation, which is usually done after project completion to examine the lessons that may be learned and used to the benefit of future projects (Von Zedtwitz, 2002).

While capturing lessons after project completion is useful, Rowe (2007) advises that it is necessary to capture lessons throughout the life cycle of the project, he asserts that If you wait until the end the project for a large project you miss some of the key lessons, because of the time that has elapsed, project team members may forget some of the things they learned or team members assigned to the project in the early phases may no longer be part of the project during the later phases. Some schools of thought hold that lessons should also be captured after the occurrence of an incident. Cooke and Rohleder (2006, p. 217) describe an incident as "*an unexpected or unwanted change from normal system behavior which causes or has the potential to cause a loss"*. The authors further emphasise that effective project learning requires an organisation to have an incident learning system which they define as "… *a set of organisational capabilities that enable the organisation to extract useful information from incidents of all kinds, particularly near-misses, and uses this information to improve organisational performance over time"*.

Dülgerler and Negri (2016) note that the common practices where lessons are gathered directly from project stakeholders, through workshops, meetings, and so on have shortcomings due to the fact that eliciting lessons can be a hard job because people are normally reluctant to admit failures. In their view, LL capturing can be enhanced if lessons are collected in moderated sessions in which every participant can contribute anonymously to the identification of the problem e.g. through the use of the Delphi method which supports anonymity. Apart from anonymity, the factor of impartiality in capturing LLs has also been extensively discussed. Wysocki (2014) advocates for the use of an independent facilitator who will lead the project team through an analysis of project activities that went well, what needs improvement. The contention for an independent facilitator is to remove elements of bias as well as blame apportioning.

Despite the prerequisite to capture LLs, whether solely as part of closing processes, or anywhere during the project, many projects managers do not routinely capture lessons learned in part due to lack of a defined capturing process in place, especially because LLs are handled on a project by project basis with no standardized tools or consistency among projects hence the need for organisations to have defined processes and basic tools and techniques (Trevino and Anantatmula, 2008). They further aver that obtain optimum results, capturing lessons learned should be facilitated by someone other than the project manager (with the project manager participating to provide content in key areas), as the project manager's closeness to the project may cause a bias in obtaining a fair review. The importance of an independent facilitator needs not to be overemphasized. Larson and Gray (2011, p. 518) describe this independent facilitator as a "guide who leads the project team through an analysis of project activities that went well, what needs improvement, and development of a follow-up action plan with goals and accountability" . They further insist that selection of the facilitator should not be a random selection from the project office, rather the key requirements for the person should at the minimum include: no direct involvement or direct interest in the project; perceived as impartial and fair; respect of senior management and other project stakeholders; willingness to listen; independence and authority to report review results without fear of recriminations from special interests: perceived as having the best interests of the organization in making decisions and; broad-based experience in the organization or industry. According to Rowe (2007) the facilitator should review key documents and project survey results, and then prepare a list of questions specific to the project, use lessons learned categories during the session to help focus the participants thinking and discussion and should always ask the three key questions: what went right; what went wrong and; what needs to be improved.

2.3.2 Analyzing LL

Lessons that have been captured need to be analyzed to make sense out of what has been captured as well as to give the organization a better understanding of what can be improved. Piantanida et al (2010) denote the principal purpose of LL analysis is to compare newly collected LL with existing ones, to organize them so that they are simple to use and to share them with the Project team. It is important to analyse and decode LL, otherwise the LL become futile as noted by Lazar (2014) wherein he notes that the organisation would have lessons logged, just gathered and stored data, not converted into information and triggers for change, which will result in a waste of

resources, time, effort, and, more than anything, waste in motivation of the team members, demonstrating a lack in leadership and consideration for early accomplishments.

According to Larson and Gray (2011) the analysis process examines in detail the underlying causes of problems, issues, and successes, it involves concise, factual review statements of the project, for example, project mission and objectives, procedures and systems used, and organizational resources used. A review of the literature suggests that there are several techniques of undertaking a detailed analysis of lessons learned including inter alia Cause-Effect Analysis and Root-Cause Analysis (RCA).

Lehtinen and Mika (2011) define RCA as a structured investigation of the problem to identify which underlying causes need to be fixed, the ultimate goal is to decrease the likelihood of a problem's reoccurrence by controlling its root causes. Lehtinen and Mika (2011) further assert that RCA should seek to detect the target problem, identify and organise the root causes of the target problem and finally innovate corrective actions for the most important root causes. Along the same breadth, Rowe (2007) delineates RCA as a technique used to identify the underlying reason or condition that causes the occurrence of an undesired activity or state, the objective being to identify reoccurring problems in late or failed projects. In a similar sequence, Rowe (2007) suggests that RCA should start with identifying root causes of an occurrence, with emphasis on true causes and not symptoms, once the root causes are identified then steps to eliminate them can be conducted.

Williams (2004) as cited by Trevino and Anantatmula (2008) suggests that RCA can be done using mapping techniques such as cause-effect diagrams to show the chains of causality. One such cause-effect diagram is the Fishbone diagram.

The Fishbone diagram (also known as Ishikawa diagram) is an analysis tool that provides a systematic way of looking at effects and the causes that create or contribute to those effects (Ilie and Ciocoiu, 2010). Figure 2.1 shows a typical fishbone diagram.

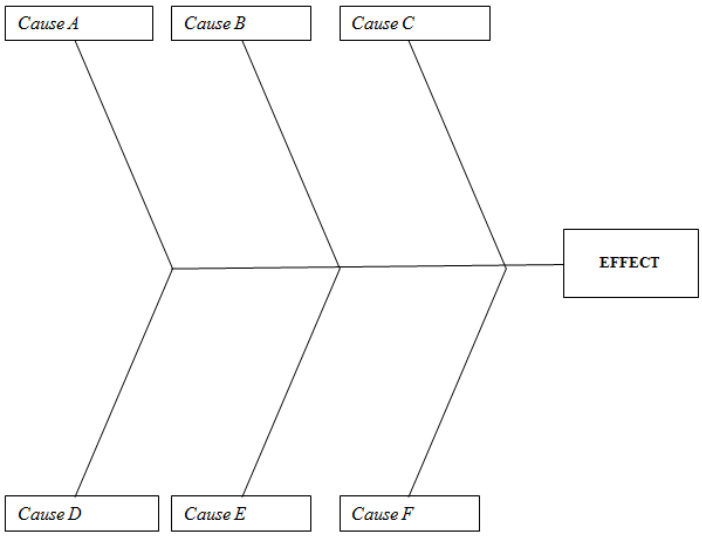

Figure 2.1 a Typical Fishbone Diagram, Source: Coccia (2017) pp. 293

According to Bose (2012), it is defined as a fishbone because of its structural outlook and appearance, which looks like a skeleton of a fish. The American Society for Quality (2005) as cited by Bose (2012, p. 18) expound that the fishbone diagram analysis typically evaluates the causes and sub-causes of one particular problem and therefore assists to uncover all the symptoms of any business problem, hence it is also termed as "Cause-Effect analysis" . Bose (2012) further explains that in a typical fishbone diagram the main problem which is required to be resolved has been put on the head of the diagram and the causes are put as the bones (wherein the causes are categorised into six variables i.e. people, equipment, materials, environment, management, and process), and then smaller bones are created as the resemblances of the sub-causes. Ishikawa (1986) as cited by Bose (2012) explains that analysis of each of the categories of the variables reveals the reasons for a problem irrespective of its type or severity. Ilie and Ciocoiu (2010) contend that the fishbone analysis helps the team members analysing the lessons think in a very systematic way and encourages group participation and utilises group knowledge as the analysis is carried out by people who were involved in the project.

While numerous literature is inclined to RCA being a problem cause and effect analysis, some authors emphasise that it also suffices for positive experiences. In that case, the group undertaking the analysis then discusses what the causes of the experience might have been and as more causes are identified, a positive root-cause analysis on good management is made (Bjørnson et al, 2008).

This is consistent with Rowe (2007)'s contention that in addition to root causes, the analysis team should also identify best practices so they can be incorporated into existing methodologies, processes, procedures, and training programs.

Analysis of project lesson learned can also be done using the affinity diagram, also known as The Kawakita Jiro or KJ method, a form of a brainstorming session where the project team discusses the most significant experiences (both positive and negative) from the project. (Bjørnson et al, 2008). According to PROJECT-MANAGEMENT.COM, an affinity diagram organizes ideas, problems, and solutions into related groups after a brainstorm, it helps categorize and organize a large number of fragmented uncertain information into logical cohesive groups through the use of labels in the analysis process. KJ sessions normally comprise five basic procedures i.e. label making where the project group brainstorms and writes concepts or thought related to the experience of concern on separate labels; label grouping where labels that appear to belong together should be arranged close to each other and kept at a distance from other labels to form a group ; group label naming where after about two-thirds of the labels have been grouped, the team can start making one-line headers (summarised sentences) as titles for each grouping ; spatial arrangement where the groups are arranged into a chart to make better sense out of the summarised concepts, and verbal or written explanation where the chart is explained clearly to help the audience to understand the interrelationships among components of the problem thoroughly (Kunifuji, 2013).

2.3.3 Storing LL

Analysis of LL is often followed by storage/archiving, so that the rest of the Organisation can easily access as and when need arises, as correctly noted by Rowe (2007), after lessons learned are captured, they should be reported to project stakeholders, furthermore different types of reports should be produced based on the audience especially because some lessons may have to be restricted to specific reports because of their sensitive nature. Rowe (2007) further explains the different types of reports that can used to store lessons learned: the detailed lessons learned report; the summary which is normally a brief for leadership summarizing the findings and providing recommendations for correcting the findings; the executive report which presents an overview of

the lessons learned process and a summary of project strengths; what went well, project weaknesses; what went wrong and recommendations; what needs to be improved.

Regardless of an organization's size, its personnel needs a knowledge storage system so as to retain the lessons they learn on all projects (Trevino and Anantatmula, 2008). Devising a storage system for LL however does not translate to learning as echoed by Graham and Thomas (2010) who exclaims that lessons are often get lost in lessons learned databases that nobody ever looks at, preventing companies to really learn from experience and running the risk to repeat the same mistakes again and again. Perhaps it is for this reason that Crosman, 2002 as cited by Trevino and Anantatmula, 2008 recommends that organizations should use a simple system with an interface that is intuitive, easy-to-use, and Web-based, a system based on searchable keywords, also known as triggers so that organizations can find relevant lessons quickly.

Trevino and Anantatmula (2008) demonstrate the need for an easy to use database when they cite Li (2002), who referred to the NASA scenario wherein the official agency-wide repository for lessons learned was not widely used because the lessons stored covered so many topics that it was difficult to search for an applicable lesson and it was difficult to weed through all the irrelevant lessons to get to the few jewels needed.

The Construction Industry Institute (2007) as cited by Ferrada et al (2015) note that most organizations that already have a LL program use a searchable, web-based database with some degree of security, however they are not widely used because the documents that existed tended to focus very much on what had been achieved by a project team (product knowledge) rather than how this had been achieved and/or why it either worked or did not work (process knowledge) (Newell, et al., 2006). The same authors indicated that what might be more useful is knowledge about the process since this has potentially much wider relevance across different projects.

The deduction one can then make form this advice is that organisations need to store only the most effective lessons to avoid overloading the database with unnecessary lessons that will not necessarily bring about the desired improvement. Larson and Gray (2011) advise that at the minimum the repository should classify projects by type or characteristics to allow prospective

readers, teams, and project managers to be selective in the search and use of report content, this would ease information searching and encourage the use of LL. Nel and Pretorious (2017) also submit that another way of enhancing the LL repository is to use indexing, coding, and categorization to make it easy for the user to access the lessons.

Kendrick (2008) emphasizes that good project management is based on experience, not only personal but by learning from the experience of others, hence The Project Experience Risk Information Library (PERIL) database provides an ideal project learning platform. He asserts that the database is a compilation of data which summarises both a description of what went wrong and the amount of impact it had on each project, furthermore the database provides a sobering perspective on what future projects may face and is valuable in helping to identify at least some of what might otherwise be invisible risks. Organisations can benchmark from the PERIL database and custom make their own that is a compilation of summaries of the organisation's projects experiences.

2.3.4 Disseminating LL

There are two types of knowledge that can be obtained from projects. Reich & Wee (2006) as cited by Trevino and Anantatmula (2008) identify tacit and explicit knowledge as the two different types of knowledge. Schindler & Eppler (2003) explain that explicit knowledge answers the what, where, and how many questions, whereas, tacit knowledge refers to the know-how and know-why questions.

As noted by Piantanida et al (2010), lessons dissemination is aimed at sharing knowledge with the team, to organise stored knowledge and to transform it from individual learning into company learning. Bellini et al (2016) define knowledge dissemination as the process of learning from previous projects through an interactive exchange of experiences and further avers that knowledge constitutes the mind of an organization, therefore, effective knowledge transfer process becomes essential for the creation of successful outcomes in projects. In concurrence with this notion Prinsloo et al (2017) contend that knowledge dissemination is a process through which the sources of the knowledge (individuals or organisations) communicate the knowledge to a particular target audience.

Effective knowledge transfer has been found to have a significant impact on project performance as it has been found to improve the relationships between employees, improve technical and problem-solving skills and also enhance key decision-making skills and has the potential to positively influence an Organisation's long-term success (Power and Cormican, 2015). It needs not to be overemphasised that lessons learned from projects need to be effectively disseminated in order for effective project learning and organisational success to occur.

The dissemination of knowledge can occur by two methods, push and pull, where push methods deliver the knowledge directly to the user based on their role, interests, training, and experience, while pull methods leave the burden of search to the user, who must devote their attention to the source (Weber and Aha 2002 as cited by Graham and Thomas (2010)) and Gagnon (2011) as cited by Prinsloo et al (2017) stated that producers of the knowledge "push (disseminate) knowledge toward audiences who they believe need to receive it". From this notion, one deciphers that project team members will have knowledge inculcated in them by virtue of them being actively involved in the project and gaining actual experience (pull). This distinction of explicit and tacit knowledge is further brought to fore by Raychem & Weisberg (2009) and Wei Choo (2000) as cited by Olaniran (2017) when they express that explicit knowledge can be easily codified and conveyed in the forms of written documents such as reports, technical drawings, manuals, and operating procedures. These written documents can easily explain the what, where and how of previous projects. Tacit knowledge, on the other hand, is individualistic in nature and cannot be possibly reduced to written documents (Goffin & Koners, 2011; Nonaka, 1994; Polanyi, 1967; Rosenberg, 1982 as cited by Olaniran, 2017) as it is gained through learning by doing, and it is hard to communicate.

On the contrary for anyone else other than project team members to absorb the knowledge they have to go through the process of searching for the knowledge that has been stored in repositories (push). Disseminating knowledge through pull processes can be enhanced by assigning each lesson to an owner, typically a team member who is very interested in and familiar with the retrospective, the team member/owner will serve as the contact point for anyone needing information (expertise, contacts, templates, etc.) relating to the lesson (Larson and Gray, 2011).

Love et al (2016) maintain that whilst explicit knowledge can be obtained and expressed readily, tacit knowledge is gained through informal interpersonal contacts and sharing knowledge in a social and situated setting as tacit knowledge is embedded in specific social contexts. Fernie et al. (2003) as cited by Love et al (2016) suggest that sharing (rather than transfer of) should occur through a process of socialization as people will learn through observation, dialogue and conversations between people as they participate and interact within one another. The concern, however, is that team members are often reluctant to openly share their experiences and knowledge, as well as seek advice due to issues of blame and internal competition. Power and Cormican (2015) suggest that employees within an organization require the existence of trust in order to openly transfer their knowledge between their team member as interpersonal trust has been found to eliminate the tendency for employees to blame fellow team members for both organizational and project failures, therefore this concern of team members 'reluctance to openly share experiences can be abated by developing a culture of openness and sharing, by motivating and engaging people and embedding knowledge management activities in the day to day business processes, internal systems, and structures.

Several suggestions for effective dissemination of project knowledge have been put forth. Nikoletta Kaszás et al (2016) suggest the traditional approach of increasing organizational competencies and memory through on-the-job training to provide an opportunity for newly employed members of the organization to fit in more easily and during which the new employee can get to know the corporate procedures, rules, and processes in order to apply them with confidence in later tasks. Olaniran (2017) suggests that project knowledge can be easily codified and conveyed in the forms of written documents such as reports, technical drawings, manuals, and operating procedures.

PMI (2015) however notes that not all methods or resources of sharing knowledge achieve the objectives of knowledge transfer—they don't necessarily engage people in a meaningful way, especially if the only approach is the use of passive knowledge repositories. They further contend that organizations that are effective at knowledge transfer create a more interactive process that facilitates direct, person-to-person knowledge transfer. Baxter (2015) concurs with PMI (2015) as

he notes that while documentation is important, project participants find that the real value comes from the conversation itself and being able to hear and ask questions about why experts made the decisions they did, that while transcripts or videos of the interviews seem like they would be the best path to transfer knowledge, most transcripts could run into hundreds of pages and the videos into hours. To combat this overwhelming amount of information, he suggests a short summary cognitive checklist format be developed.

2.3.5 Infusing LL

Infusing LL can be termed 'the real digestion of the lessons' by the organization (Trevino and Anantatmula, 2008). It is at this stage that knowledge that has been obtained either through involvement in a project or by means of disseminated from past projects is put to fruition in subsequent projects.

According to Marlin (2008) placing Lessons Learned in a database only means we have documented and communicated the lessons. The learning part only comes when the lesson has been institutionalized (e.g., changing a policy, writing a procedure, revising a standard, issuing a new specification, improving a work process, etc.). Marlin (2008) further justifies that infusion is the toughest part of Lessons Learned,;until the learning has become a part of the way organisation's do business, they will always be prone to make the same mistakes, the Lessons Learned database will contain many different types of learning, but the Lessons Learned process must ensure that the most significant lessons are institutionalized.

The ability of organizations to value, assimilate and apply new knowledge is referred to as 'absorptive capacity' (Love et al (2016, p. 1123)). Zahra and George (2002) as cited by Love et al (2016) refer to absorptive capacity as an organization's dynamic capability whereby its processes and routines have embedded within them the dimensions of acquisition, assimilation, transformation, and exploitation. The bottom line of project learning is that an organisation needs to have such capacity to utilize and assimilate knowledge from past projects to enhance new ones.

Bresnen et al. (2003) as cited by Love et al (2016) acknowledge the importance of learning through social patterns, practices, and processes, but place emphasis on adopting a community-based

approach to managing knowledge, they believe that such an approach can provide an appropriate platform for situated learning, which is akin to learning-on-the job to materialize through the processes of observation, dialogue, storytelling and conversations between people as they participate and interact within one another. PMI (2015) also concur that the absorptive capacity of project teams is mostly entrenched through social learning; NASA, for instance, NASA acknowledges social context learning through encouragement of a culture of collaboration and mentorship as the complexity of their projects demands an open, vigorous culture where communication is continuous, empowering individuals and teams at all levels to ask questions, share information, and raise concerns. Another successful organisation Boeing, the manufacturer of large aircrafts, also harnesses the benefits of social learning through two primary initiatives: The use of Boeing Designated Experts (BDEs) provides readily discoverable functionally vetted experts that support business needs across the enterprise, such experts are readily available to provide project teams with knowledge as and when need arises; The use of Communities of Practices (CoPs), Organisation based homogenous groups who capture solutions in their community space, making them available for future reference as well as using the communities to connect senior employees with newer employees, facilitating knowledge transfer naturally, during the course of figuring out solutions and advancing their field of endeavour (PMI, 2015). A synthesis of literature leads one to conclude therefore that knowledge absorption strategies vary for explicit and tacit knowledge; explicit knowledge can be easily absorbed from documents while tacit knowledge can be harnessed more successfully through social interaction.

2.4 Challenges with LL

As already alluded, to the implementation of LL is not without challenges as attested to by various authors. This section will discuss the LL challenges. Trevino and Anantatmula (2008) is of the view that infusion of tacit knowledge is the hardest because it is intuitive and it is difficult to express, and that its transfer is further hindered by the silos created by those individuals who do not like to share their explicit and tacit knowledge, and that it is difficult to measure an individual's willingness to share their knowledge resources. What this means therefore is that some individuals may keep the knowledge to themselves and this often results in project amnesia which according to Schindler & Eppler (2003) occurs when a project is nearing its end and the project team returns

back to their functional or line responsibilities without sharing or documenting the knowledge they acquired from working on a specific project.

Pantanida (2010) believes that tacit knowledge is not codified and difficult to formalize since it is based on practical experience, short-lived and volatile. It is embedded in the knowledge patrimony of people, and people can only make it explicit via direct contact with other people. He further asserts that an important tool to help to share tacit knowledge is Virtual Communities, i.e. groups of people who interact with the scope of promoting knowledge exchange; The virtual communities can use information tools, such as e-mail, chat, video conferences and so on (all these have a possibility to record and retrace the contacts); moreover, they are based on personal relationships between people. This essentially suggests that virtual platforms can, in fact, provide an opportunity for people who have been involved in various projects, internally as well as externally to share experiences and infuse LL.

Backlund and Chroneer (2015) are of the view that the challenges of implementing LL are largely associated with the temporary nature of projects. This is in synch with Schindler and Eppler (2003) as discussed above that at the end of the temporary projects team players are redeployed to their functional duties, taking valuable tacit knowledge with them.

Olaniran (2017) suggests that sharing tacit knowledge can be enhanced through the use of formal settings, such as training events or conferences, informally during project activities involving different teams, informal social networks, and workers' interactions. However, the fundamental ingredient is that for formal and informal tacit knowledge sharing to take place effectively in project teams, individuals must be ready and have the capacity to share their know-how or understanding and to use the skills acquired (Foos, Schum, & Rothenberg, 2006 as cited by Olaniran, 2007); also, the cohesive environment is of utmost importance for sharing tacit knowledge as this may facilitate close interactions and cooperation among individuals.

Love et al (2016) are of the view that major limitations to implementing lessons learned by employees are time constraints as team members are under constant pressure to adhere to pre-defined project deliverables that are more often than not overly optimistic. Consequently, teams

seldom have time to invest in additional activities they do not perceive to be of immediate value. (Paranagamage et al (2012) as cited by Love et al, (2016).

Wysocki (2014) believes that managers avoid evaluation because they don't want to pay the cost, the pressures on the budget (both time and money) are such that managers would rather spend resources on the next project than on those already completed furthermore they view evaluation as non-high priority, other projects are waiting to have work done on them, and completed projects don't rate very high on the priority list.

The value of project evaluation, however, cannot be downplayed. Some authors have suggested ways in which these evaluations can be enriched to achieve their intended purpose.

2.5 Suggested Improvements for Lessons Learned

A review of literature from various sources reveals that suggestions for improving project evaluation are two fold i.e. some are inclined to the timing of the reviews and others to the methodology used.

Shand (2002)'s school of thought holds that since a post-mortem can't cure the patient, a team must review as it works, not after it disperses, to support truly great results. The emphasis here is on the timing of the project reviews, that they need not be put off until project closing but rather need to be a continuous process. Shand (2002) further emphasises that periodic reviews shouldn't be separate from the work; they should rather be part and parcel of the project and should be incorporated into the project plan from the start. Rowe and Sikes (2006) concur with this as they insist it is not necessary to wait until the end of the project for the learning to occur, that lessons can be identified at any point during the project, therefore a lessons learned session should be conducted at different time frames based on the criticality and complexity of the project, with key times being at the end of the project, at the end of each phase and real-time – when you learn the lesson.

The methodology employed in conducting lessons learned has also been suggested to enhance the benefits. Ilyas, Hassan, and Ilyas (2014) s' line of thinking are that the process should be led by an

independent facilitator to ensure that current biases do not impede the discovery of lessons learned or shaping of recommendations for the future. The suggestion for an independent facilitator could be borne out the perception that conducting lessons learned is a "witch hunt" exercise intended to blame some project players, so an independent facilitator would be more unprejudiced as they would have no "bone to grind" with any project player. Furthermore, the independence of the facilitator is most likely to give more reminiscent feedback unlike a project manager who would be more of a "judge, jury and executioner". While lessons learned have commonly been conducted through project team meetings, Shand (2002) suggests checklists and measures can be used to supplement the meetings.

Grant(2008) suggests that the evaluation should be done as a three-tier process to improve its outcome; Tier 1 consisting of a project survey being distributed to every project participant, she advises that it is best if the survey is confidential so people will be more comfortable in responding honestly; Tier consisting of facilitated sessions with mid-level management from the vendor and customer teams, she advises that during the sessions they should brainstorm major project successes and issues and document the results in PPR report; and Tier 3 consisting of a review meeting with senior management to review Tier 1 and Tier 2 output, and gain management consensus for future improvements.

The bottom line is that LL ad project knowledge management is critical for organizational success. Project managers must, therefore, overcome barriers that lead to organizations not retaining lessons from projects; they need to create a learning environment for capturing, analyzing, storing, disseminating, and reusing lessons learned from projects (Schindler & Eppler, 2003). Furthermore, as noted by PMI (2013) lessons may be identified at any point, even though most such exercises are conducted at the closeout phase.

2.6 Research Conceptual Framework

Sitko (2013) as cited by Amade *et al* (2015) defines a conceptual framework as a set of broad ideas and principles taken from relevant fields of inquiry and used to structure a subsequent presentation. Implicit from the literature review is that there are various perceptions to what constitutes LL best

practice. These perceptions were summed up to advance a theoretical model LL which was used as a benchmark for the research. The model is represented by figure 2.1.

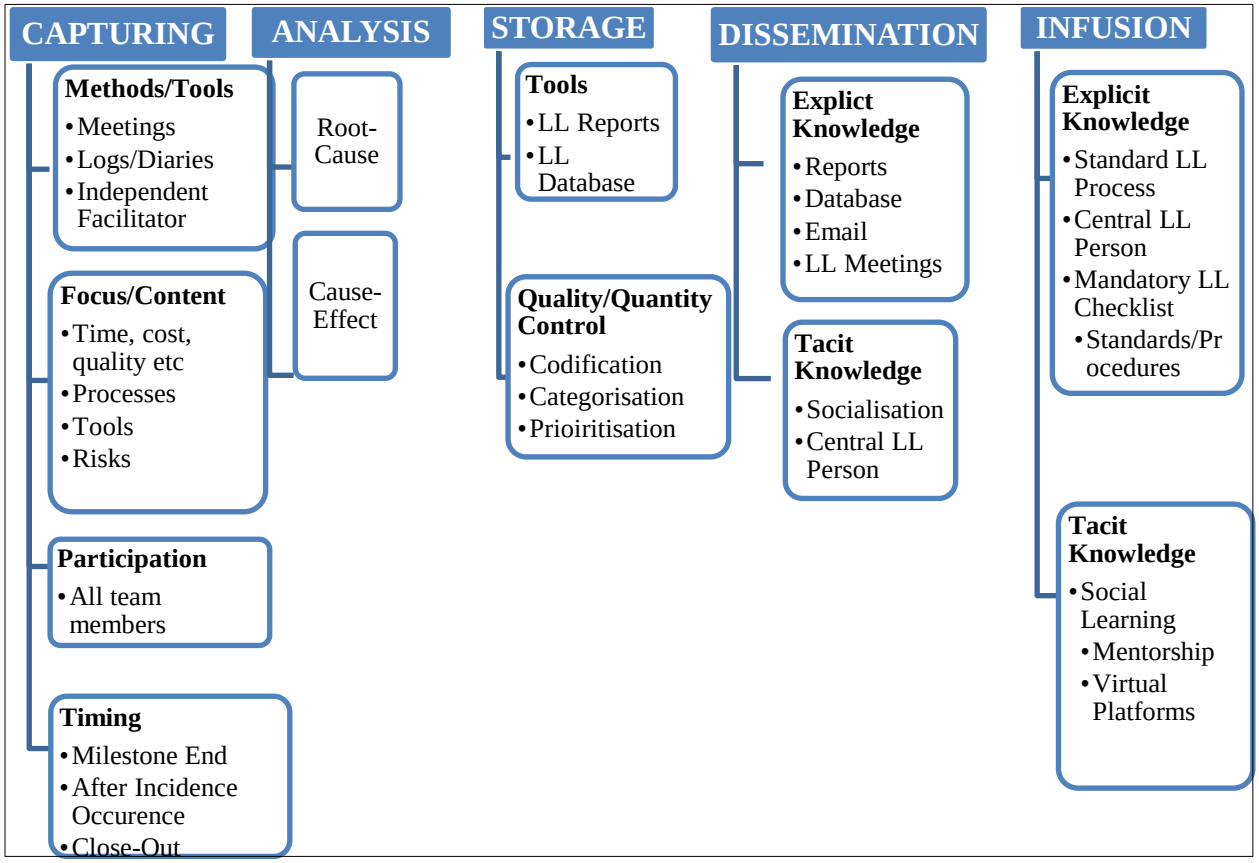

Figure 2.1: Research Conceptual Framework

2.7 Chapter Summary

What is deductive from the literature is that obtaining and utilizing LLs is an important activity in project closing processes. For LL to be worthwhile, it is imperative however that all the processes must be undertaken systematically as in order to effectively realize project learning and overall project success. A synthesis of literature suggests that the fundamental LL processes are capturing, analyzing, storage, dissemination and infusion. These processes will form the core of the investigation in this research.

CHAPTER 3: RESEARCH DESIGN AND METHODS

3.1 Introduction

The purpose of any research is to provide answers to the research question. There are numerous methods of obtaining answers to the research question, each method with its own set of advantages and disadvantages. This chapter outlines how the research was carried out; specifically, the chapter outlines justification for the utilised research strategy, population and sampling strategy, data collection methods, data analysis methods, research limitations, and ethical considerations.

3.2 Justification of Research Strategy

The research was carried out using the case study strategy. Crowe *et al* (2011) define a case study as a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. The fundamental principle of a case study is that a concept is scrutinized in its natural context, the way it happens, with no simulation.

Yin (2009) contends that the choice of research strategy depends on three conditions; the type of research question, the control an investigator has over actual behavioral events and focus on contemporary as opposed to the historical phenomenon. He further advances that the case study method is generally preferred when "how" or "why" questions are being posed; when the investigator has little control over events, and; when the focus is on a contemporary phenomenon within a real-life context. The case study was found to be the most appropriate method in this research for the following reasons: the research question was a ‘how’ question intent on establishing how effective the gathering and utilisation of lessons learned from projects by BTO is; the researcher did not have control over the events i.e. could not manipulate the way events occur; the focus of the research was on a contextual phenomenon which has occurred within the organisation, the organisation is actually undertaking projects and does have LL processes in place.

It is noteworthy that some research methods, specifically the experiment and histories methods may also have satisfied the conditions as discussed above. While historical method can answer the ‘how ‘and ‘what ‘questions and the investigator also has no control over the events, the case study

approach was still better as it adds two sources of evidence not usually included in the historian's repertoire: direct observation of the events being studied and interviews of the persons involved in the events, furthermore the study's unique strength is its ability to deal with a full variety of evidence-documents, artifacts, interviews, and observations which are beyond what might be available in a conventional historical study (Yin, 2009). Experiments can also answer the same questions as case study however the investigator can manipulate behavior directly as variables can be controlled.

Three different types of case studies as explained by Crowe *et al* (2011) are intrinsic case study, where the case is selected not because it is representative of other cases, but because of its uniqueness, which is of genuine interest to the researcher; instrumental case study where a typical case is selected, the case is selected as it is representative of the phenomenon under study; collective case study where there is an exploration of multiple instrumental case studies.

The research was an instrumental case study, the case being the Investment and Product Development Department of BTO. Conclusions and inferences drawn from the department were then be taken to generally apply to the organisation as a whole. BTO was selected as the case study because of the prominent projects it has developed, and further because of its proximity to the researcher's base. The Investment and Product Development Department of the organisation was selected because it is the one that executed the projects.

The case study approach has successfully been used by similar previous studies. Chronéer and Backlund (2005) employed the case study approach to determine how Swedish project-based organizations within an engineering and construction context manage and support project learning; Johanssona, Moehlerb, and Vahidic (2012), in their study "Knowledge Sharing Strategies for Project Knowledge Management in the Automotive Sector", undertook a case study of how Project Knowledge Management could be improved to better support knowledge sharing between projects within the specific case company of Volvo Technology. Yuan and Skaik (2014) in their research on "The Current Lessons Learned Practice in the Construction Industry in the UAE" undertook a case study of three construction companies in the UAE; Ferada et al (2015), in "A Lessons-learned System for Construction Project Management: a Preliminary Application" successfully used a case

study of three companies to establish how construction companies undertake LL and how LL can be used to support the improvement of the management of construction projects; Love et al (2016) in their research "Building absorptive capacity in an alliance: Process Improvement Through Lessons Learned", also used the case study of a program alliance, The Barwon Water Alliance, to determine how an alliance was able to maximize its 'absorptive capacity' (i.e. its ability to value, assimilate and apply new knowledge) through instigating LL;

The research further used content analysis to assist in suggesting a lessons learned framework for the organisation as per one of the research objectives. Krippendorf (2004) as cited by Bengtsson (2016, p. 9) defines content analysis is defined as "*a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use*". Bengtsson (2016) contends that the process of analysis reduces the volume of text collected, identifies and groups categories together and deduces meaning from the data. In this research, a deductive analysis of the data collected from the literature review, as well as the findings with regards to the status quo of project learning within the organisation and the organisational environment in general, was undertaken. Common elements of LL process as acknowledged by different researchers were identified to come up with the research conceptual framework. A synthesis of a combination of the research conceptual framework and the research findings was employed to suggest an LL framework for the Organisation's projects. A similar strategy was used by Duffield and Witty (2012) wherein they undertook a deductive analysis of data to develop systemic lessons learned and captured knowledge (SLLCK) model. Their study went a step further to test and validate the model on several pilot focus groups.

3.3 Population and Sampling Strategy

According to Tichapondwa (2013), a sample in a research refers to a group of cases selected from all possible respondents in a population in which the study is being conducted, while a population is the whole target group that has common characteristics that are of interest to the research. The population for this research was all the five (5) projects that BTO has completed so far. The projects have been selected because they are similar in nature i.e. they were all construction of tourism facilities. The completed projects as listed in Table 3.1. In view of the fact that the sample

frame consists of only five projects, which are considered a small number, the research covered LL processes for all the projects. Purposive sampling was used to select the research respondents. Purposive sampling was the preferred sampling method because it selects individuals because of some defining characteristic that makes them the holders of specific data needed for the study (Tichapondwa, 2013). In this case, selected respondents were BTO staff members who were directly involved in the projects, specifically, the project manager, the project officers and administrative officers for each of the five projects.

Table 3.1: Research Sampling Frame

PROJECT TITLE	PROJECT LOCATION	PROJECT PRODUCTS	COMPLETION DATE	Sample Size(No. of Respondents Involved in the Project)
1. Lepokole Nature Reserve	Lepokole	Nature Reserve with viewing decks, rock paintings, walking trails, curio shop, campsites and offices	December 2014	4
2. Tsabong Ecotourism Park	Tsabong	Luxury accommodation tents, restaurant, campsites, camel riding, and quad biking	November 2013	2
3. Goo-Moremi Resort	Goo-Moremi	Luxury accommodation chalets, restaurant, campsites, cultural tours, and rock climbing	January 2012	4
4. Seboba Recreational Park	Kasane	Amphitheatre, curio shop, cultural village, picnic sites, and viewing decks	December 2012	2
5. Qchwihaba Caves	Qchwihaba	Campsites, hiking trails, caving expeditions, picnic sites, viewing decks	December 2014	4

3.4 Data Collection

The research used mixed methods of data collection in two forms as outlined by Tichapondwa (2013); a combination of quantitative (numeric) and qualitative (text/descriptive) data collection methods, as well as a combination of primary and secondary data collection methods. How each of the methods was used is discussed in detail in subsequent subsections.

A four-stage primary data collection method as reflected in figure 3.1 was used. The first stage was review of the project documents to get initial insight into the management of lessons for each of the projects; the second stage was through the use of a questionnaire; the third stage was through follow-up telephone interviews with some respondents to seek more clarity on their responses, especially on the open-ended questions; and the fourth and final stage through focus group discussions with the project manager and the project officers.

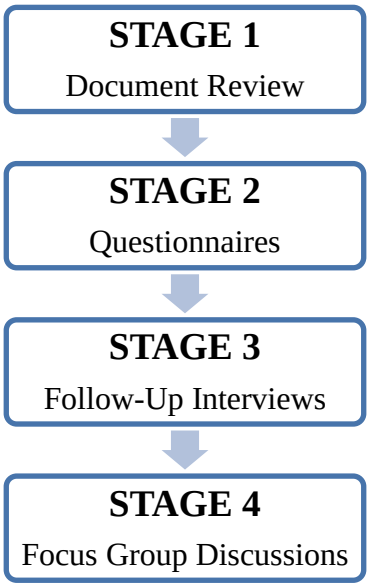

Figure 3.1: Proposed Primary Data Collection Process

3.4.1 Document Review

The researched undertook a detailed review of the completed projects' documents to obtain initial insight into management of lessons learned for each of the projects. The documents that were reviewed were Projects' Terms of Reference, Progress Reports, Meeting Minutes and Evaluation

Reports. The document review also included a review of the organisation's website and the online documents library.

3.4.2 Questionnaires

A questionnaire with a total of seventeen (17) questions was used as one of the data collection tools. The questionnaire was a combination of closed-ended questions and Likert scale questions. A typical Likert scale is a 5- or 7-point ordinal scale used by respondents to rate the degree to which they agree or disagree with a statement (Sullivan and Artino Jr, 2013). In this case, the Likert scale had five responses for respondents to select their ratings. The same questionnaire was used for all the respondents. Questionnaires were distributed to the portfolio manager, the project manager as well as to the project officers to obtain their views on the organisation approaches to Lessons Learned. The questionnaire comprised three sections as follows:

Section A: Respondents' Profiles

This section consisted of questions on the profile of the respondents with respect to project execution in the organisation. The section sought to determine the specific projects in which the respondents participated. The section further sought to determine the specific roles the respondents played in the projects, to better understand the varying perspectives as the different role players in the projects. The purpose of profiling the respondents was to provide a level of certainty that given their years of experience and level of involvement in the projects, they are capable of providing useful insight into LL management in the Organisation.

The summary of the profile of the respondents was found to be as outlined in Table 3.2.

Table 3.2: Summary of Respondents' Profile

Respondent ID	No. of Project(s) Involved in	No. of Years' Experience	Role in the Project(s)	Project(s) Involved in
1	1	8	Project Officer	Goo-Moremi
2	1	8	Project Officer	Seboba
3	2	9	Project Officer	Lepokole, Gqwhihaba
4	1	4	Project Admin	Goo-Moremi
5	5	10	Project Manager	All 5 projects
6	3	9	Project Officer	Goo-Moremi, Gqhwihaba, Tsabong
7	2	7	Project Admin	Lepokole, Gqwhihaba
8	1	10	Project Admin	Tsabong
9	1	4	Project Admin	Lepokole

According to the table, all of the respondents were involved in at least 1 project at BTO, with the project manager having been involved in all the projects. The results further show that all the respondents had several years' experience working with the organisation's projects. The involvement of all the respondents in at least one BTO project, as well as the experience of the respondents gives assurance that there was representation in terms of respondents, for each of the BTO completed projects. It further gives assurance that the respondents have given realistic insight into the LL processes as they were directly involved in the BTO projects. The table also shows that the respondents played different roles in the projects; therefore, the responses given were from different perspectives.

Section B: Management of LL at BTO

This section collected data on the various LL management processes and sub processes, in order to determine the nature of LL management practice at the Organisation as well as the respondents''

perceptions on the processes. Data collected in this section enabled the researcher to further determine the adequacy or lack thereof of the LL management processes.

Section C: Barriers to LL Management

This section collected data on what each participant perceived to be the barriers to effective management of LL for BTO projects. Data collected in this section was used as an input into the recommendations for improvement of management of LL for BTO projects. The sample questionnaire is attached herein as Appendix 1.

3.4.3 Interviews

The third stage of the data collection process was follow up interviews. A follow-up interview was conducted with the project manager after responses from all the questionnaires were collated. The collated responses set the tone for the kind of questions to ask in the interview. Specifically, the interview sought to get an in-depth understanding of how some LL processes were executed and why some other processes, which are viewed as fundamental, were never used for the projects. A transcript of the interview is attached herein as Appendix 2.

3.4.4 Focus Group Discussions

The fourth stage of the data collection process was a focus group discussion with the project officers to get their perspective on the Organisation's LL processes. Findings from the questionnaire and the interviews were used as a basis for the line of discussion in the focus group sessions. The focus group discussions conducted included discussions with specific project teams e.g. Tsabong Ecotourism Park team.

3.4.5 Data Collection Summary

The principal purpose of undertaking a research is to answer the predetermined research question. The Research objectives as discussed in chapter 1 were set to systematically answer the research question. It is therefore obligatory that the data collected in the research ought to address the research objectives and subsequently the research question. Table 3.2 provides a summary of the data collection methods used per objective as a way of ascertaining that indeed the data collected and the methods to be used were appropriate for the research.

Table 3.2: Data Collection and Analysis per Objective

Data Required	Data Source	Data Collection Method	Data Analysis Method
RO1: To Determine the Processes Used in Management of Lessons Learned from Projects at BTO			
BTO's current LL capturing and analysing processes BTO's current LL storing processes BTO's current LL disseminating processes BTO's current LL infusing processes	BTO Project Documents (electronic and hard) BTO Project Personnel	Document Review Questionnaires Follow-up interviews Follow-up focus group discussions	Frequency tables Charts/Graphs (Raw data processed in MS Excel to produce tables, graphs and charts)
RO2: To Determine the Adequacy of the Processes as Compared to Best Practice			
BTO's Current LL Management Processes; strengths and deficiencies Best practice for Management of LL	BTO projects documents (electronic and hard) BTO projects personnel Literature Review (For Best Practice)	Document Review Questionnaires Follow-up interviews Follow-up focus group discussions	Rubric Assessment
RO3: To Develop a Framework For the Management of Lessons Learned from Projects at BTO			
Conceptual Framework Gaps in BTO's LL processes	Literature Review Findings from BTO's processes	Document Review Questionnaires	Smart Art to develop the frameworks Comparison

3.5 Data Analysis

Subsequent to data collection, the analysis was undertaken to deduce meaning out of the data and to make conclusions and inferences that will answer the research question and objectives. The research used a combination of qualitative and quantitative data analysis methods. The data analysis used for data per each objective is outlined in the subsequent subsections. The summary of the data analysis is provided in Table 3.2.

3.5.1 Data Analysis for Objective 1

For the questionnaire, all the questions on the LL management processes used were close ended in nature, whereby techniques/tools for each process were provided for respondents to select answers from. Responses for some questions were collated and recorded in an MS Excel Sheet, and subsequently graphs and charts deduced from the selected data sets. From the presentations (i.e. the graphs and charts), deductions were made on the prevalence of the use of the techniques for those LL management processes. Responses for other questions were collated and recorded on tables, and subsequently the ratio of the responses calculated to determine the prevalence of use of the LL management processes. Likert scale questions on the effectiveness of the LL management processes were also analysed in MS Excel, by first recording the number of responses for each response, then calculating the responses ratio to determine the respondents' effectiveness ratings for each of the processes. In document review, for each project, a broad matrix comprising all five LL management processes was developed and all key practices/findings as obtained from the documents were placed in the appropriate sections of the checklist.

3.5.2 Data Analysis for Objective 2

To determine the adequacy of the LL processes used by BTO, each of the processes was subjected to a rubric assessment. A rubric (scoring guide) with four varieties of scales (i.e. non-existent/underdeveloped, minimally developed, well-developed and highly developed), to show the levels of adequacy of the processes was created. Each of the scales was given a rating ranging from 1, being the lowest, and 4 being the highest. The overall LL management adequacy was computed as the average for all the five processes. Clear quality definitions for each of the scales was provided. Based on the strengths and short comings as discussed in the analysis section for

objective 1, each of the LL management processes was ranked accordingly. The rubric is illustrated in Table 3.3.

Table 3.3: The LL Management Process Adequacy Rubric

Non-existent/underdeveloped (1)	**Minimally developed (2)**	**Well-developed (3)**	**Highly developed (4)**
There is no evidence that there are methods/techniques/tools in place; there is no evidence of implementation of the practice	Minimal methods/techniques/tools are articulated or can be implied but don't represent comprehensive practice; evidence of ad hoc implementation of the processes	A developing process is articulated; there is evidence of ongoing implementation of the processes	Established processes are articulated; there is strong evidence of systematic implementation of the processes

3.5.3 Data Analysis for Objective 3

To come up with the suggested LL management framework for BTO, the current practice was articulated in a diagram (figure 4.5) and a comparison made between the current practise chart and the conceptual framework (figure 2.1). Based on the discussions and findings, a framework appropriate for BTO was then developed (figure 4.6).

3.6 Data Reliability and Validity

To ensure reliability and validity of the data collected the research used multiple data collection methods (primary and secondary) as demonstrated above. This was to ensure that there are substantiation and consistency in information and conclusions.

The sampling technique used, i.e. purposive sampling, wherein the sample comprised of only people directly involved during the projects' execution also ensured reliability and validity of the findings. All the respondents were involved in at least one of the projects; one (1) respondent was involved in all five (5) projects; one (1) respondent was involved in three (3) projects; three (3) respondents were involved in two (2) of the projects. This assured a higher level of confidence in

the findings since the respondents were all involved in the projects, albeit at different levels. Furthermore, the respondents were involved in the projects at different levels, for instance, there was a project manager, a projects officers and projects administration personnel. The sample was therefore capable of providing genuine insight into the management of lessons learned for BTO projects.

To further ensure validity and reliability pilot testing of the questionnaire was done. A set of test questionnaires was initially sent out to three officers in The Estates Division of the department, who also execute their mandate through projects, albeit of a different nature (non-construction). The piloting was intended to fine-tune the questions, identify omissions and redundant questions (Tichapondwa, 2013). Consequently, inferring from the responses provided, the questionnaire was fine-tuned to include additional response option of "none".

3.7 Limitations of the Research

The following factors were limitations to the research:

i. Primary data was collected directly from internal project players only, and not from external players such as outsourced service providers and the community partners. There was a risk of bias in the responses provided, furthermore the study missed out on the opportunity of the valuable perspective of the LL processes.
ii. The research scope was limited to only one organisation and therefore the findings cannot be generalised and deemed to be applicable to other similar organisations.

3.8 Ethical Considerations

The researcher ensured professionalism, integrity, and confidentiality at all the stages of the research process. Specifically, the following ethical considerations were made:

i. A research permit was initially sought from The University of Botswana as it is where the research is domicile. Subsequently, an introductory letter from The University to MENT was issued to facilitate the issuance of a research permit by the latter.
ii. A research permit was sought accordingly from MENT as it is a statutory requirement in Botswana. The research permit is attached as Appendix 2.

iii. Data collection instruments, particularly questionnaires were accompanied by a cover letter to inform the study subjects what the research was about; seek their consent and assure them of confidentiality and anonymity of their responses. All the respondents signed the research consent forms accordingly.

iv. Project documents to be reviewed will be ethically sourced from the rightful authorities.

v. All data sources were duly acknowledged in the write-up.

3.9 Chapter Summary

This chapter has given a comprehensive account of how the research was carried out: justification for the use of the case study strategy, the "case" being BTO, has been provided; the sampling frame has been articulated ; data collection methods including primary data collection methods (questionnaires, interviews and focus group discussions) and secondary data collection methods (literature review and document review), as well as how they have been used have been clearly spelled out; data analysis techniques and tools have also been adequately articulated. The methodology as outlined has resulted in entirely answering the research question and addressing the research objectives.

CHAPTER 4: DATA COLLECTION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter discusses the analysis of the data that was collected, as well as the ensuing interpretations of the findings thereof. The chapter is organised into four sections i.e. LL Management Processes at BTO, Adequacy of the LL Management Processes, The Suggested LL Framework for BTO, and Integrated Discussion of Findings. The data analysis is based on one questionnaire administered to the different project personnel, a follow-up interview with the project manager, follow-up focus group discussions, as well as the organisation's projects related documents.

4.2 LL Management Processes at BTO

This section presents the data analysis and discussion of the findings for each of the five LL management processes.

4.2.1 Capturing of Lessons Learned

4.2.1.1 LL Capturing Processes Used

Table 4.2 shows the processes that BTO used to capture LL, as well as the effectiveness of the processes used, for the five (5) completed projects.

Table 4.2 (a) and (b): LL Capturing Processes Used and their Effectiveness Ratings

A. *LL CAPTURING PROCESSES USED*

Capturing Process	**No. of Respondents**	**Ratio of Response**
Logs/Diaries	1	11%
Project Audits	2	22%
Workshops	0	0%
Meetings	6	67%
Independent Facilitator	0	0%
Total	**9**	**100%**

B. *LL CAPTURING PROCESSES EFFECTIVENESS RATINGS*

Capturing Process	**Effectiveness Ratings**			
	Very Effective	**Effective**	**Very Ineffective**	**Ineffective**
Logs/Diaries	100%	0	0	0
Project Audits	0	50%	0	50%
Workshops			N/A	
Meetings	14%	72%	0	14%
Independent Facilitator			N/A	

Table 4.2 (a) indicates the most prevalent LL capturing method used for BTO projects is meetings (70%), followed by project audits (20%) and the least used is log diaries (10%). These findings are consistent with those of Trevino and Anantatmula (2008), wherein their research established that meetings and individual interviews were the main way the respondents captured LL activities, followed by regular audits and diaries. The focus group discussion with the project admins and project officers as well as the interview with the project manager revealed that project meetings were held to review how the project went as well as to debrief the team, however was no evidence of such meetings was presented (e.g. in the form of minutes of the meetings) ; project audits were solely done by the organisation's audit department as part of routine operations 'audit, with

emphasis on conformance or non-thereof to laid out processes; and project logs/diaries were purely used by some individuals as their own initiative of keeping their own project records. From the results, workshops and the use of an independent facilitator to capture lessons are never used for capturing of LL at the organisation. The follow-up interview with the Project Manager brought to fore that workshops were not used simply because it is perceived that meetings serve the same purpose as workshops, therefore, it would be duplication to undertake them; independent facilitators have never been used simply because there is no precedent for use of such.

Table 4.2 (b) indicates that 14% and 72% of the respondents opine that meetings are very effective and effective respectively while only 14% opine that they are ineffective. The results further show that 50% of the respondents believe that the use of audits to capture lessons is effective while the remaining 50% believe it is ineffective. All of the respondents who use logs/diaries to capture lessons believe that they are effective.

It is praiseworthy that BTO uses a variety of tools (i.e. meetings, audits and individual logs/diaries) to capture LL. While the use of meetings, audits and logs/diaries to capture LL is generally effective in projects, more value can be obtained from using, additionally, an independent facilitator to run LL capturing session(s). The worth of the use of an independent facilitator for capturing of project lessons is acknowledged by Dülgerler and Negri (2016) as well as Wysocki (2014) who note that capturing of project lessons can be challenging due to the fact that project players are normally reluctant to admit failures hence the need for a moderated session, most commonly through the use of an independent facilitators to remove elements of bias as well as apportioning blame.

4.2.1.2 Participants in Capturing of Lessons

Figure 4.1 shows who the participants in the capturing of lessons at BTO were according to the respondents.

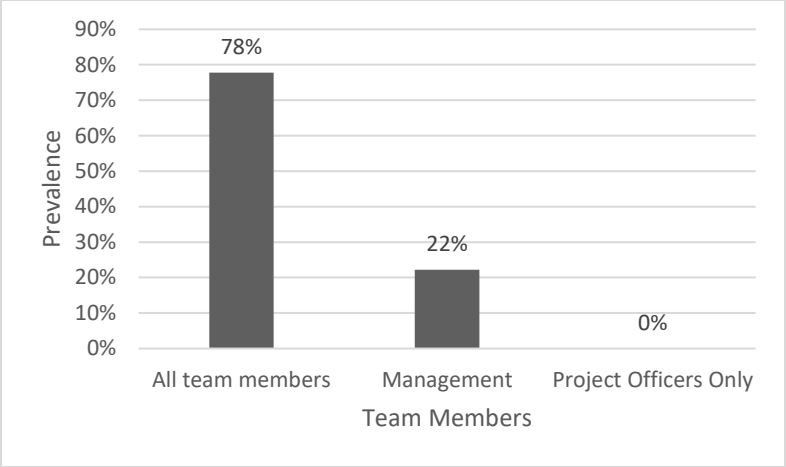

Figure 4.1: Participants in LL Capturing

Figure 4.1 shows that majority of the respondents (78%) have indicated that all team members were involved in capturing of LL while only a small proportion (22%) have indicated that only management is involved in capturing. These results could indicate that in most cases all project team members participate in the processes of capturing of projects 'lessons learned, however in some cases lessons capturing is done by managers only. It emerged from follow-up interview with the project manager that while the desirable scenario is to have all project team players participate at all times in the collection of lessons there were challenges such as time constraints and the scattered geographic dispersion of project team members. These challenges as expressed by the Project Manager are in line with the viewpoint of Backlund and Chroneer (2015) and Schindler and Eppler (2003) wherein they hold that challenges of implementing LL are largely associated with the temporary nature of projects, at the end of the projects team players are redeployed to their functional duties. The status quo where LL capturing is mostly done by all team members is praiseworthy, however it is deemed unproductive for management, to capture LL on their own as lessons (good and bad) are experienced by all team members, therefore if LL capturing is to be holistic and realistic it must involve all project team players.

4.2.1.3 Stages of Capturing LL

The stages at which LL are captured for BTO projects are shown in Figure 4.2.

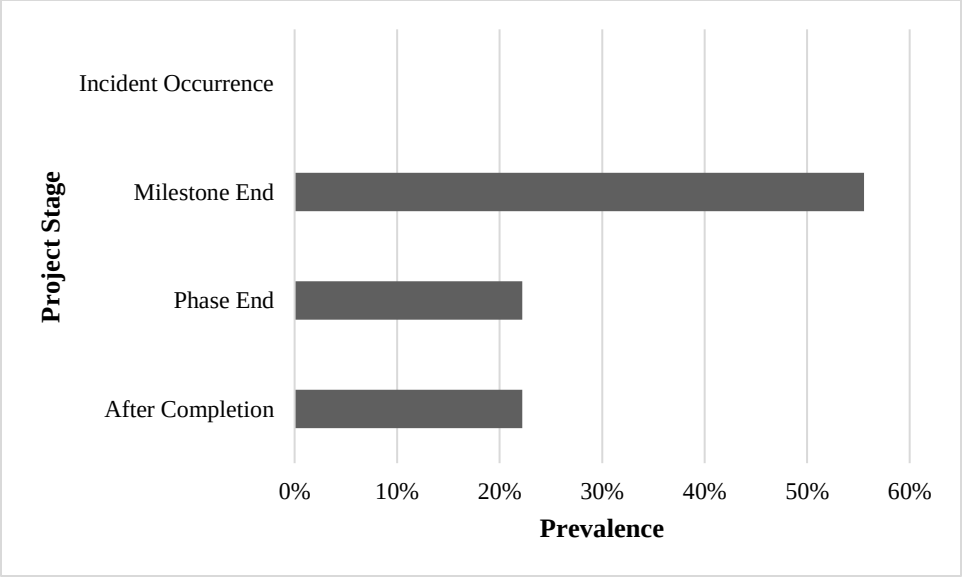

Figure 4.2: Stages of Capturing LL for BTO Projects

The results in figure 4.2 indicate that 56% of the respondents reported that LL were captured at the end of a milestone, while 22% reported that LL are captured at the end of a project phase and the remaining 22% reported that LL are captured after project completion. The results therefore imply that LL are captured at various stages in the project stages, however the most prevalent practice is at the end of a milestone. Document review of some of the milestone and phase end meeting minutes as well as some project handover reports confirmed that indeed capturing of lessons did occur at all the three stages shown in Figure 4.2. On the other hand, it is worth noting from the results while lessons are captured throughout the project lifecycle, the results also show that capturing of lessons after incidence occurrence is never done, suggesting that the organisation does not place emphasis on incident learning contrary to Gort et al (2010) who opine that incident prevention is strongly based on learning from previous incidents, and that when experiences of previous incidents are translated into preventive measures, an organization can prevent incidents in the future and the need for repressive actions at that time.

The practice of capturing LL at different stages of projects at BTO is commendable as the risk of missing some of the key lessons is minimised, as correctly noted by Rowe (2007) who advises that collecting LL only at project completion is risky as project team members may forget some of the things they learned due to time lapse, and furthermore other project team members may not be available during the later project phases.

4.2.2 LL Analysis Techniques Used

Table 4.3 (a) - (b) shows the LL techniques used, as well as their effectiveness ratings, for all the BTO projects.

Table 4.3 (a) – (b): LL Analysis Techniques Used and their Effectiveness Ratings

A) LL Analysis Techniques Used

Analysis Techniques	**No. of Respondents**	**Ratio of Response**
Brainstorming	9	100%
Cause Effect Analysis	0	0%
Root Cause Analysis	0	0%
None	0	0%
Total	**9**	**100%**

B) LL Analysis Techniques Effectiveness Ratings

Analysis Techniques	**Effectiveness Ratings**			
	Very Effective	**Effective**	**Very Ineffective**	**Ineffective**
Brainstorming	22%	45%	11%	22%
Cause Effect Analysis			N/A	
Root Cause Analysis			N/A	
None			N/A	

According to Table 4.3 (a), all the respondents indicated that brainstorming is the only technique that was used for the projects. The interview with The Project Manager and as well as the focus group discussion with project officers revealed that brainstorming sessions are usually held as part of the evaluation meeting, either at the end of the project or at the routine milestone meetings held on site. The results further suggest that other techniques such as cause-effect analysis and root-cause analysis are never used. Table 4.3 (b) indicates that majority (45%) of the respondents believe that brainstorming analysis techniques is effective, 22% believe it is effective while 11% and 22% believe it is very ineffective and ineffective respectively.

While the results show that analysis of LL is in fact undertaken, through ordinary brainstorming, the researcher opines that the analysis process is not necessarily purposefully structured therefore not adequate. Organised brainstorming should entail the use of Root Cause Analysis (RCA) and Cause-Effect Analysis techniques such as the Fishbone diagram (also known as Ishikawa diagram), a tool that provides a systematic way of looking at effects and the causes that create or contribute to those effects (Ilie and Ciocoiu, 2010), and affinity diagrams, also known as The Kawakita Jiro or KJ method, a form of a brainstorming session where the project team discusses the most significant experiences (both positive and negative) from the project, organises ideas, problems, and solutions into related groups after a brainstorm, (Bjørnson et al, 2008). The use of ordinary brainstorming poses a very high risk of not identifying real problems, their root causes and consequently the right corrective and/or preventive solutions for project problems.

4.2.3 LL Storage Techniques Used

The LL storage techniques used for BTO projects and their effectiveness ratings are displayed in Table 4.4 (a) - (b). The table shows that majority of the respondents (78%) indicated that for the projects that they were involved in lessons learned were stored in progress reports. The results also show that a smaller proportion of the respondents (22%) assert that audit reports were used to store LL. The results further show that LL reports, LL database and the BTO website were never used for storage of LL. The researcher further logged on to the BTO website and established that indeed the website is not used for storage of projects LL. Table 4.4 (b) indicates that in terms of the LL storage facilities used, 50% of the respondents were of the view that audit reports are effective while the remaining 50% were of the view that they are ineffective. 11% of the respondents opined that the use of progress reports for LL storage was very effective while 67% opine that they are just effective.

These results indicate that BTO used mainly audit reports and projects progress reports for storage of LL, and further that other LL storage facilities such as LL database, the organisation's website were never used. The researcher reviewed some of the projects progress report and observed that the reports do not have explicit sections on LL, rather the lessons can be inferred from the contents of the reports. The respondents explained during the interview that progress reports have information that suffices as lessons, such as, causes of project delays, which can be used as a

benchmark for future projects. The findings as regards BTO LL storage is similar to the findings of Yuan and Skaik (2014), wherein they established that in the case of UAE construction companies, storage of lessons was limited to the archived documentation level. The difference in the findings, however, is that while in the case of UAE construction companies as per Yuan and Skaik (2014) actual lessons were recorded in the documents, at BTO actual lessons are not explicitly recorded but can rather be inferred from the reports. The absence of explicitly recorded lessons is in fact consistent with Carrillor, Ruiker and Fuller (2012) 's findings that none of the companies they researched had a dedicated system that was labeled "lessons learned", instead, the respondents described a number of different initiatives that could be construed to be lessons learned.

The practise of LL storage for the BTO projects was found to be good in that some form of lessons can be drawn from the audit reports and progress reports. However, the shortcomings observed are that the LL are not explicit; Accessibility of the audit reports for drawing of lessons is a challenge, hence the need for deliberate LL reports which are audience specific to address issues of confidentiality and/or sensitivity of the lessons; Useful LL storage techniques such as the use of a dedicated database that could be an ideal platform for project learning.

Table 4.4 (a) - (b): LL Storage Techniques Used and their Effectiveness Ratings

A) LL Storage Techniques Used

Storage Techniques	**No. of Respondents**	**Ratio of Response**
LL Report	0	0%
LL Database	0	0%
BTO Website	0	0%
Audit Reports	2	22%
Progress Reports	7	78%
Total	**9**	**100%**

B) LL Storage Techniques Effectiveness Ratings

Storage Techniques	**Effectiveness Ratings**			
	Very Effective	**Effective**	**Very Ineffective**	**Ineffective**
Audit Reports	0%	50%	0%	50%
Progress Report	11%	67%	0%	0%

4.2.4 LL Dissemination Techniques Used

Table 4.5 (a) and (b) illustrates the techniques used to disseminate the LL from completed projects, as well as the effectiveness ratings of the techniques used.

Table 4.5 (a) – (b): LL Dissemination Techniques Used and their Effectiveness Ratings

A) LL Dissemination Techniques Used

Dissemination Techniques	**No. of Respondents**	**Ratio of Response**
LL Meetings	2	22%
Email Distribution	1	11%
BTO Website	0	0%
Electronic Database	0	0%
Document Distribution	1	11%
None	5	56%
Total	**9**	**100%**

B) LL Dissemination Techniques Effectiveness Ratings

Dissemination Techniques	**Effectiveness Ratings**			
	Very Effective	**Effective**	**Very Ineffective**	**Ineffective**
LL Meetings	0%	50%	0%	50%
Email Distribution	33%	67%	0%	0%
Document Distribution	11%	67%	0%	22%

The results in Table 4.5 (a) show that 56% of the respondents indicated that there were no techniques in place to disseminate LL, 22% indicated that LL meetings were used, 11 % indicated that email distribution was used and the remaining 11% indicated document distribution was used. Table 4.5 (b) indicates the effectiveness ratings of the LL dissemination techniques that were used. The table depicting that 50% of the respondents believed LL meetings were effective while 50% believed that they were ineffective; 33% of the respondents believed that email distribution was very effective while 67% believed that it was effective, and; 11% of the respondents believed that document distribution was effective, 67% believed that it was effective while only 22% believed that it was ineffective. The techniques used were explained during the focus group discussions;

the respondents explained that previous projects' reports e.g. evaluation reports, Terms of Reference, progress reports etc. (from which lessons can be extracted) were sometimes circulated to project team members, either as hard copies or via email; the respondents also explained that sometimes LL meetings, referred to as project evaluation meetings were held after project completion to compile the lessons. The respondents further explained that this was not done for all the projects and that no evaluation reports were produced. The use of meetings to disseminate LL is consistent with Chronéer and Backlund (2005)'s findings where experiences within Swedish project-based organizations within an engineering and construction context was in different forms of meetings.

The results suggest that in the main there were no LL dissemination techniques in place. This could suggest that in most cases, projects LL were just stored/recorded and not disseminated, a situation which Lazar (2014) refers to as "the organisation would have lessons logged, just gathered and stored data" which is not passed on to others. The results also suggest that if any dissemination of LL was done, it was in the form of meeting and distribution of project documents. This means that only explicit knowledge is disseminated (the "what, where and how" as explained by Schindler and Eppler, 2003, which are extracted from written documents (Olaniran, 2017)). On the other hand, there is no evidence that tacit knowledge is ever disseminated. Love et all (2016) explain that tacit knowledge is more individualistic in nature and that whilst explicit knowledge can be obtained and expressed readily, tacit knowledge is gained through informal interpersonal contacts and sharing knowledge in a social and situated setting as tacit knowledge is embedded in specific social contexts.

4.2.5 LL Infusion Techniques

The findings on LL infusion techniques used for BTO projects, and their effectiveness ratings are displayed in Table 4.6 (a) - (b).

Table 4.6 (a) - (b): LL Infusion Techniques Used and their Effectiveness Ratings

A) LL Infusion Techniques Used

Infusion Techniques	**No. of Respondents**	**Ratio of Response**
Social Platforms	3	33%
Standardised Project Process	0	0%
Mandatory LL Checklist	0	0%
Central LL Person	0	0%
Mentorship	0	0%
None	6	67%
Total	**9**	**100%**

B) LL Infusion Techniques Effectiveness Ratings

Infusion Techniques	**Effectiveness Ratings**			
	Very Effective	**Effective**	**Very Ineffective**	**Ineffective**
Social Platforms	0%	100%	0%	0%

According to Table 4.6 (a) most (67%) of the respondents indicated that no LL infusion techniques were used for the projects, while 37% of the respondents indicated that social platforms were used. The table further indicates that for all the projects there were no standardised project process to be followed, mandatory LL checklists, mentorship and central LL person to facilitate infusion of the lessons. Table 4.6 (b) indicates that all the respondents viewed the use of social platforms as effective for infusion of LL. The findings show that primarily, no LL infusion techniques were used for BTO projects. The findings also suggest that in some cases social platforms were used to infuse LL from projects. The follow-up interviews revealed that the use of social platforms ranged from informal chats between project team members to organised social chats, particularly the use of "WhatsApp" where a project group was created for interactive infusion of lessons. The use of social platforms for LL infusion for BTO projects is comparable to the use by one of the companies in Carrillor, Ruiker and Fuller (2012 p. 10))'s study, of the emphasis on people-to-people

interaction to discuss project issues as "a lot of the knowledge is never committed to paper, it is never in the records" and thus they encourage communication between individuals. It is apparent from the research findings that there is use to a certain extent, of infusion of LL through social interaction. The use of social platforms to infuse lessons is acknowledged by PMI (2015) as they concur that the absorptive capacity of project teams is mostly entrenched through social learning.

Ideally, infusion of LL should occur in two forms i.e. the infusion of explicit knowledge and tacit knowledge. Explicit knowledge infusion can be achieved through institutionalising project learning, nurtured by initiatives such as having standard project learning processes to be observed during project delivery, appointing a central LL person who will be the contact for LL for each project, establishing mandatory LL checklists etc. All of these processes are viewed as facilitating infusion of lessons with regards to the what, how and why of the LL. Tacit knowledge on the other hand is embedded in the individual, learned through being involved in previous projects and cannot be easily reduced to paper, and can only be nurtured through social learning which can only occur through implementation of mentorship programs and the establishment of organisational social or virtual platforms to entrench the culture of continuous team communication to share information and raise concerns (PMI, 2015). The findings suggest that for BTO projects there were no deliberate strategies for infusion of explicit LL and that there are also no deliberate strategies for infusion of tacit LL through social learning, however it occurs in some form, by default, in the form of creation of social platforms (WhatsApp groups) by project team members to share project information.

4.3 Adequacy of the LL Management Processes

4.3.1 The Emphasis of the Lessons Learned Processes

The emphasis of the lessons learned processes used by BTO is represented by figure 4.3. The figure reflects that 78% of the respondents have indicated that the emphasis of LL processes is on a combination of both good and practise while 22% have indicated that the emphasis is on good practise only. It is safe to conclude therefore that LL processes at BTO focus mostly on a combination of good and bad practice. These findings are consistent with Secchi (1999) as cited by Weber *et al* (2000) wherein they aver that experience gained from a project may be positive, as

in a successful mission, or negative as in a mishap or failure. The findings are also aligned to Schindler and Epler (2003)'s school of thought that construction companies should conduct LL to avoid repeating mistakes as well as to ensure that past successes are replicated in future projects. The BTO practice of learning from both good and practice is deemed to be highly in order.

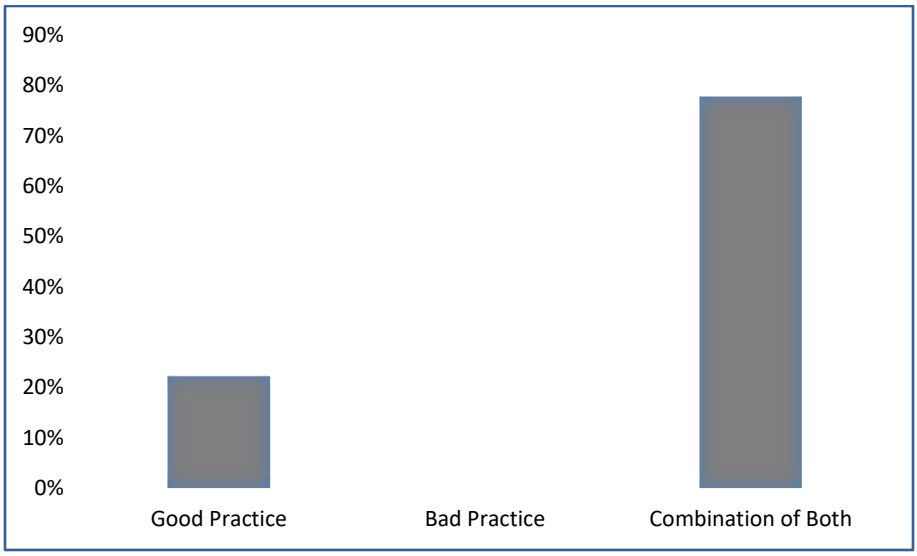

Figure 4.3: Emphasis of LL Processes at BTO

4.3.2 Reasons for Conducting LL for BTO Projects

Figure 4.4 indicates the possible reasons for conducting LL for BTO projects. The results in figure 4.4 show that all the respondents either strongly agree or agree that LL at BTO were conducted to improve on consecutive project stages, to avoid repeating mistakes and to learn for future projects. These findings are in tandem with Altuğ (2002) as cited by Elinfoo (2017), Lazar (2014) and Eppler (2003) who all opine that lessons learned are a means for learning from past mistakes, introducing improvement and changing unsatisfactory situations. In terms of conducting lessons learned to obtain a competitive edge, most of the respondents (67%) believe this is not the case at BTO. This could be due to the fact the organisation is public sector and as such obtaining competitive edge is not necessarily a priority.

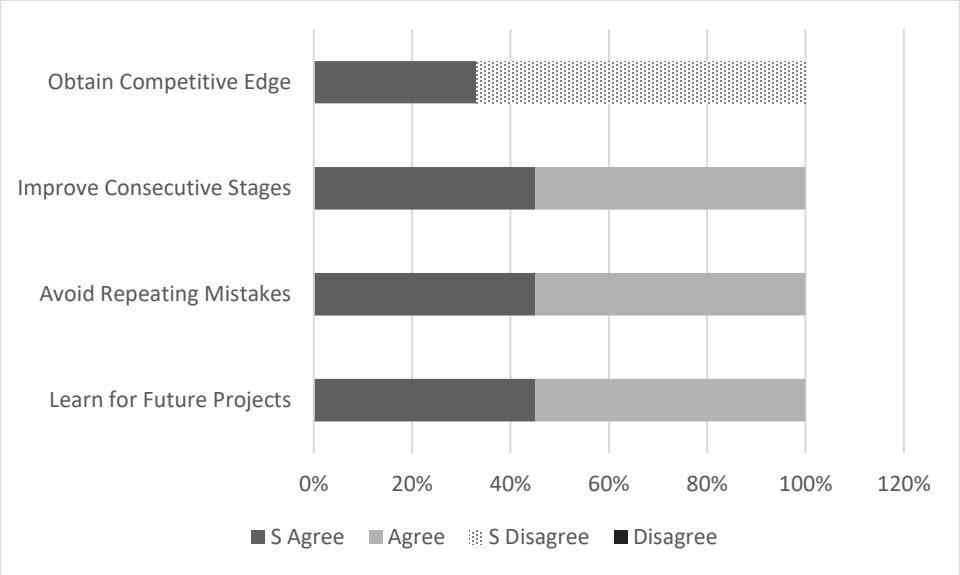

Figure 4.4: Reasons for Conducting LL

4.3.3 Barriers to Effective Implementation of LL at BTO

Figure 4.5 shows summarised responses ratings for each perceived barrier to effective implementation of LL for BTO projects.

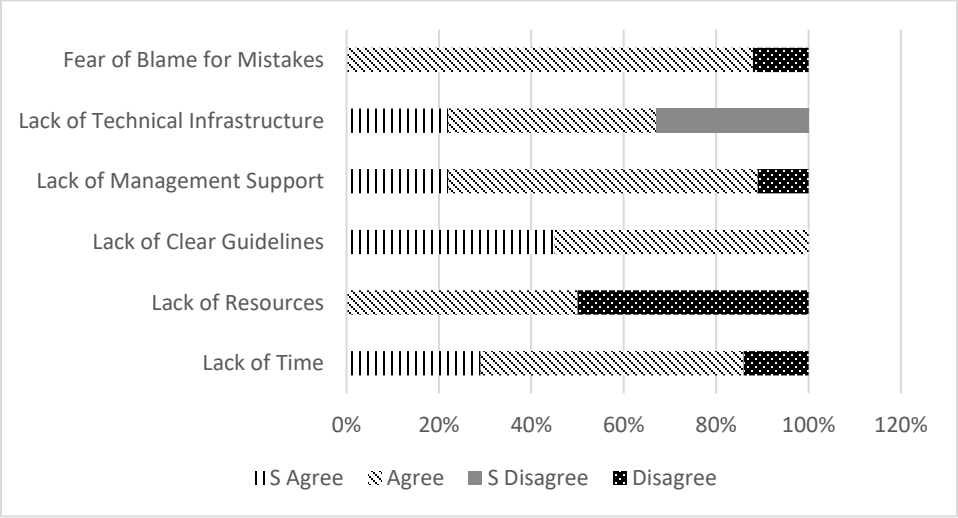

Figure 4.5: Perceived Barriers to Effective Implementation of LL

The results in figure 4.5 indicate that the respondents were agreeing and disagreeing on different levels for each perceived barrier. Majority of the respondents agreed that fear of blame for mistakes, lack of technical infrastructure, lack of management support, lack of clear guidelines and lack of time were the major factors that were barriers to effective implementation of LL for

BTO projects. In terms of lack of resources, 55 % of the respondents were of the view that this was not a barrier. Most of the findings are consistent with others elsewhere; Love et al (2016) perceive time constraints as a major limitation to implementing lessons learned by employees as team members are under constant pressure to adhere to pre-defined project deliverables that are more often than not overly optimistic; Paranagamage (2012) are of the view that teams seldom have time to invest in additional activities they do not perceive to be of immediate value. Lack of time is rightfully therefore viewed by the majority as a barrier to effective implementation of LL processes for BTO projects; Dülgerler, and Negri (2016)'s sentiments are that for any organisation to truly learn, a pattern of doing things in similar situations needs to be in place, that without such in place learning will be a challenge. Trevino and Anantatmula (2008) also aver that lack of defined processes in place, hinders effective project learning, especially because LLs there are no standardized tools or consistency among projects hence the need for organisations to have defined processes and basic tools and techniques to direct the project learning process; Wysocki (2014) believe that managers would rather spend resources on the next project than on those already completed furthermore they view evaluation as non-high priority, other projects are waiting to have work done on them, and completed projects don't rate very high on the priority list; The Construction Industry Institute (2007) as cited by Ferrada et al (2015) note lack of technical infrastructure such as a searchable, web-based database inhibit implementation of LL.

4.3.4 Overall Adequacy of LL Management

The overall adequacy of the LL management processes is illustrated in the rubric assessment in

Table 4.7. Adequacy of the LL Management Processes

LL Management Process	Rating			
	Non-Existent/Undeveloped (1)	**Minimally Developed (2)**	**Well Developed (3)**	**Highly Developed (4)**
Capturing		√		
Analysis	√			
Storage		√		
Dissemination		√		
Infusion	√			
Overall		√		

The results in Table 4.7 indicate that only LL capturing, storage and dissemination processes are minimally developed while analysis and infusion processes are non-existent/undeveloped. In accordance with the rubric, the results show that the LL capturing processes are minimally developed; the respondents have indicated that the organisation does use some methods i.e. meetings and logs/diaries to capture LL, furthermore, it is commendable that capturing is done throughout the projects phases by all team members and focuses on both good and bad practice. That notwithstanding, the current practice does not represent comprehensive LL capturing as more effective methods such as use of an independent facilitator and deliberate evaluation processes. In terms of LL analysis, the results show that the process is non-existent/undeveloped, as there is no evidence of use of appropriate purposefully structured analysis techniques such as Root Cause Analysis (RCA) and Cause-Effect Analysis techniques which can identify real problems, their root causes and consequently the right corrective and/or preventive solutions for project problems. The analysis further suggest that the LL storage processes are minimally developed as the organisation uses only LL reports, furthermore the lessons are not explicit, they can only be implied from the reports. The current LL storage process is therefore not comprehensive. Similarly, the findings show that LL dissemination processes are also minimally developed, with the use of document and email distribution only, a practice which is found to be incomprehensive. The LL infusion processes were found to be undeveloped particularly because there are no deliberate tools/methods in place for the process and furthermore, while the respondents have indicated that there is use of

social platforms, there is no evidence that they are effectively used for the infusion of the lessons. Overall the management of LL at the organisation is deemed to be minimally developed.

4.4 The Suggested Framework for Management of LL at BTO

An ideal LL framework for any organisation that executes projects is as reflected in figure 2.1 (research conceptual framework). The research findings have identified the adequacy and inadequacy of BTO LL processes. In comparison with the conceptual framework, the organisation's LL current management process is illustrated in Figure 4.6. The stroked through text represents the gaps in the current practice at BTO.

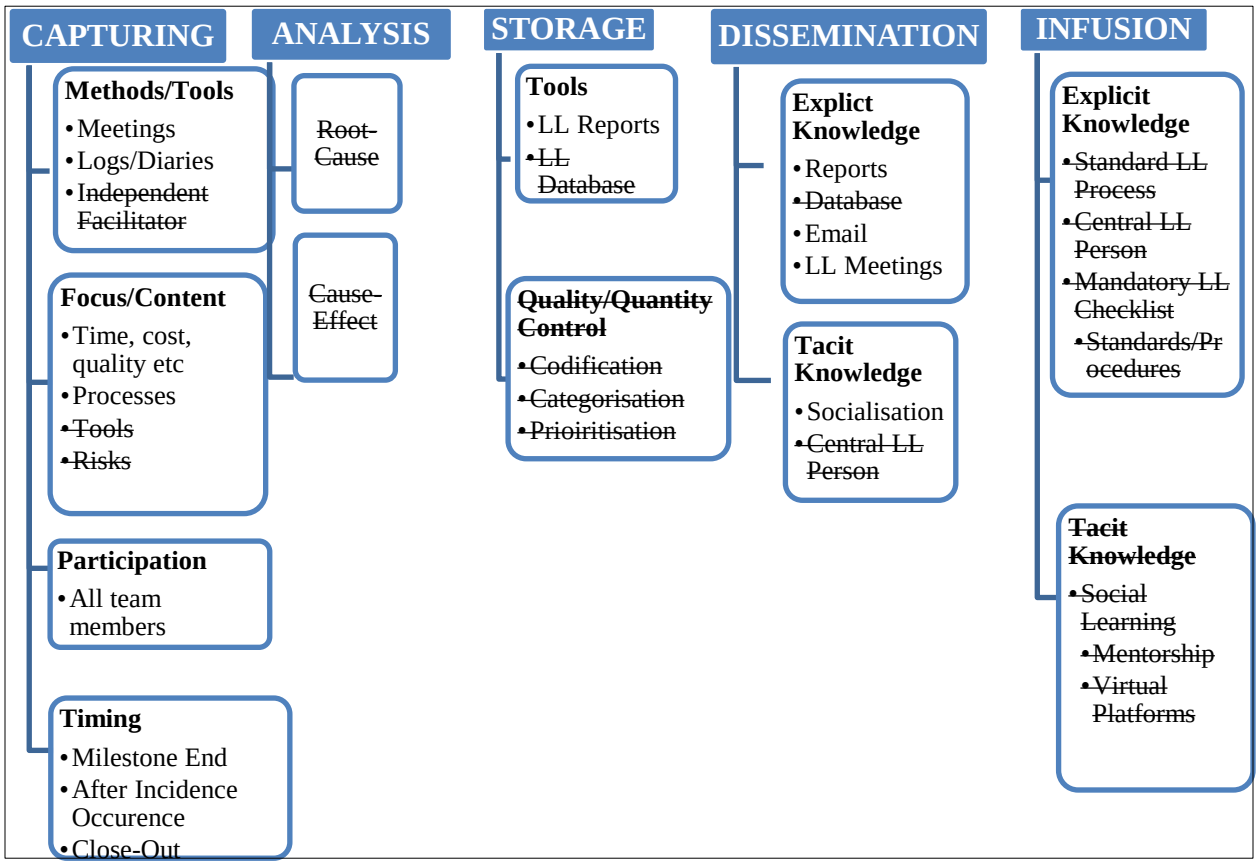

Figure 4.6: An Illustration of Current LL Management at BTO

In view of the adequacies and inadequacies in the LL management processes as already discusses, the researcher suggests an LL Framework illustrated in Figure 4.7. In a nutshell the framework

suggests: For Capturing, the organisation needs to insist on LL meetings for all projects, and produce clear LL reports which can easily be referred to for future learning; the meetings should be facilitated by an independent facilitator for objectivity of the process; For Analysing, Root cause analysis in the form of a Fishbone Diagram, should be used to identify and prioritise root causes of problems in order to appropriately put corrective measures in place to avoid their repetition in future projects, and cause effect analysis in the form of Affinity diagrams should be used to guide the project team in discussing the most significant experiences (both negative and positive) and organise possible solutions into groups; For Storage, there is need for BTO to introduce the practise of preparation of deliberate LL reports for each project, as well as establishment of a LL database, which provides an ideal learning platform with a compilation of data which summarises both a description of what went wrong and the amount of impact it had on each project For the database to be effective, it is highly recommended that the quality and the quantity of the lessons be controlled, for instance by storing only priority lessons to avoid overloading the database and making it tedious to utilise. The LL reports and the database could also serve the dissemination purpose; For further enhancement of Dissemination, a central LL person must be appointed for each project to act as a contact person for sharing experiences; For Infusion, there is need to institutionalise project learning through establishment and implementation of standards/ manuals to guide project execution and learning, as noted by Marlin (2008), real project learning is deemed to occur when the lessons become institutionalised through the establishment of a written project execution standards and procedures to be followed during project delivery; Institutionalisation could be further achieved by introducing mandatory LL checklists for each project. In terms of tacit knowledge infusion, the organisation needs to strengthen social learning, which can be done through establishment of virtual and social platforms to foster information exchange, as well as introducing project team mentorship for one on one intrinsic learning.

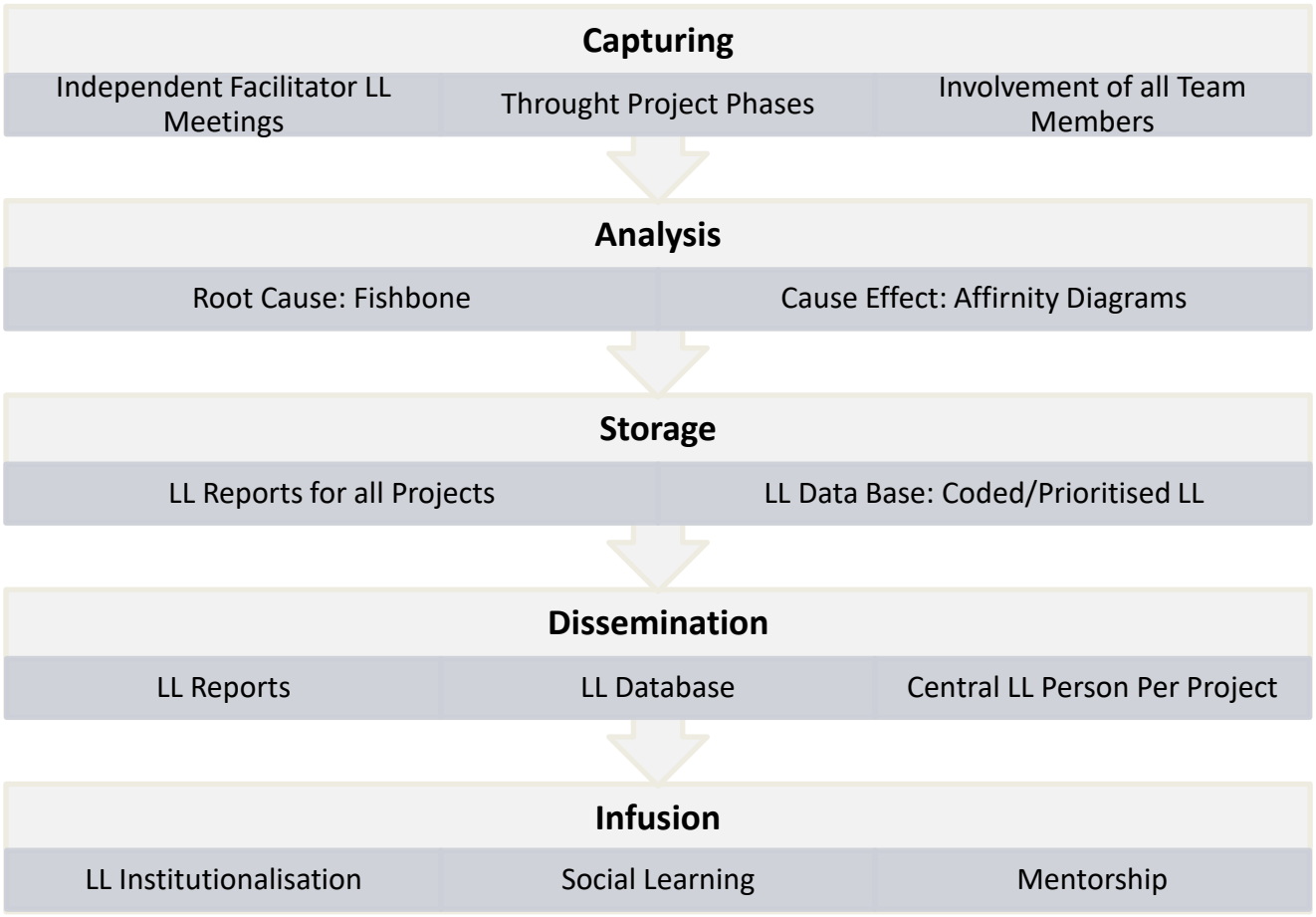

Figure 4.7: Suggested LL Framework for BTO

4.5 Integrated Discussion of Findings

The findings have shown that the LL management processes used were meetings and personal logs/diaries for capturing, unstructured brainstorming for analysis, LL reports for storage, document and email distribution for dissemination and ad hoc social platforms for infusion. Overall the LL management processes have been found to be inadequate as they were minimally developed. While capturing, storing and dissemination were found to minimally developed with some ad hoc implementation, they were deemed incomprehensive; analysis and infusion were found to be undeveloped/non-existent as there was very little evidence of their execution. A framework to bridge the noted gaps has been suggested (Figure 4.7).

4.6 Chapter Summary

This chapter has presented the data analysis and discussions thereof for each research objective. Specifically, the chapter has determined all the LL processes used for BTO projects. It is noteworthy that some of the findings were consistent with those of previous similar studies while some were somewhat divergent. The chapter has also established the adequacy and none thereof of the process, as well as suggested the stop gap measures to enhance future project learning at the organisation. The chapter has also provided answers to the research question, that the LL processes for BTO projects are not effective. The subsequent chapter will look at overall conclusions and recommendations.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study set out to investigate the effectiveness of management of lessons learned from projects at BTO. Data was collected from the selected respondents and further corroborated with follow-up interviews, focus group discussions and document review. Analysis and interpretation of the data was undertaken to arrive at the conclusions and recommendations. This chapter highlights the study conclusions and recommendations. The chapter is organised into three parts; the conclusions section, which provides the answers to the research question; the recommendations section which advances recommendations with regards to LL practice at the organisation, as well as recommendations for further research, and; the chapter summary.

5.2 Conclusions

The research has established that the processes used in managing lessons learned from BTO projects are ineffective. The following conclusions have been reached with regards to the objectives:

Objective 1:

Managing of Lessons Learned from the projects at the Organisation is through the use of LL meetings and personal logs/diaries for capturing lessons; ordinary brainstorming for analysis; LL reports for storage; document and email distribution for dissemination and only ad hoc social media for infusion.

Objective 2:

The overall management of Lessons Learned from projects has been found to be inadequate.

Objective 3: A suggested framework for the management of Lessons Learned for the Organisation is presented in Figure 4.7

5.3 Recommendations

5.3.1 Recommendations for Effective Management of LL for BTO Projects

It is recommended that for consistent successful project execution, the organisation should consider the following:

1. Institutionalising the management of lessons learned through the establishment of clear policy, guidelines and standards for project learning to ensure consistent successful project execution.
2. Strengthen project review meetings through the use of independent facilitators to coordinate the capturing of lessons to ensure objectivity and impartiality in the process.
3. Further enhance the analysis of lessons through structured brainstorming such as the use of the KJ model, and further use other analysis techniques such as the Fishbone Diagram for both negative and positive project experiences.
4. Establishment of an LL database as a knowledge repository and further ensure its functionality and efficiency through categorisation and prioritisation of lessons, to avoid undesired overload.
5. Cultivate a culture of social learning (enhancement of person-to-person learning) through the establishment of formal mentorship programmes.

5.3.2 Recommendations for Further Research

Drawing in part from the scope and the limitations of the research, it is recommended that further future research could be embarked on to determine the effectiveness of management of LL in other departments at the organisation, for instance at the Marketing Department which executes tourism events, as events can provide a good platform for project learning. It is also recommended that the research can further be extended to other parastatal organisations, to broaden the spectrum as well to come up with findings and conclusions that can be applicable widely.

5.4 Chapter Summary

The research has executed the intended methodology collect, analyse and interpret date to ultimately answer the research question which pertains to the effectiveness of management of LL from BTO projects. The ultimate conclusion has been that the management of the lessons is very ineffective. The chapter has also laid out recommendations on how BTO can improve management of LL processes for their future projects. The researcher strongly opines that the recommendations

can go a long way in ensuring improved project delivery, avoiding repeat mistakes and ultimately organisational success. The recommendations for further research will also be instrumental for the organisation as well as for the general improvement in public sector project execution.

REFERENCES

1. Alie, S. (2016). Interlocking Program and Project Governance with PMI's Process Groups: How to Form the Proper Baseline and Tailor Project/Program Governance, Paper Presented at PMI® Global Congress, Barcelona, Spain.
2. Amade et al (2015). Critical Success Factors for Public Sector Construction Project Delivery: A Case of Owerri, Imo State. International Journal of Research in Management, Science & Technology Vol. 3, No. 1.
3. Anne-Claire et al. (2002). A Knowledge Management Approach to the Creation and Sharing of Canadian Forces Lessons Learned. Paper Presented at the 7th International Command and Control Research and Technology Symposium, QC, Canada.
4. Argote, L. (2013). Organization Learning; A Theoretical Framework. Springer, Boston, MA.
5. Aziz, E. (2015). Project closing: The Small Process Group with Big Impact. Paper presented at PMI® Global Congress, London, England. Newtown Square.
6. Bengtsson M. (2016). How to Plan and Perform a Qualitative Study Using Content Analysis. NursingPlus Open Vol. 2 pp. 8–14.
7. Bjørnson F.O. et al (2008). Improving the Effectiveness of Root Cause Analysis in Post-Mortems, Inform. Software Technol.
8. Bose T.K, 2012. Application of Fishbone Analysis for Evaluating Supply Chain and Business Process- A Case Study On The St James Hospital International Journal of Managing Value and Supply Chains (IJMVSC) Vol. 3, No. 2.
9. Carrillo, P, Ruikar K, Fuller P. (2012). Disseminating Project Learning In Contracting Firms. Working Paper Proceedings for the Engineering Project Organizations Conference. Rheden, The Netherlands.
10. Chroneer D, Backlund F. (2015). A Holistic View on Learning in Project-Based Organizations. Project Management Journal. Vol.46 N0. 3
11. Coccia, M. (2017). The Fishbone Diagram to Identify, Systematize and Analyze the Sources of General Purpose Technologies. Journal of Social and Administrative Sciences Vol. 4, Issue No. 4.

12. Cooke D., Dunscombe P., Lee R. (2007). Quality Safe Health Care. Vo1.6 No.5 pp 342–348.
13. Cooke, DL & Rohleder, TR 2006, 'Learning from incidents: From normal accidents to high reliability', System Dynamics Review, vol. 22, no. 3, pp. 213-239. https://doi.org/10.1002/sdr.338
14. Crowe S *et al* (2011). The Case Study Approach. BMC Medical Research Methodology. Vol 11. pp. 100.
15. Duffield S. and Whitty S. (2012). A Systemic Lessons Learned and Captured Knowledge (SLLCK) Model for Project Organizations. In: Proceedings of the Annual Project Management Australia Conference Incorporating the PMI Australia National Conference (PMOz), Melbourne, Australia, pp15-16
16. Dülgerler, M. & Negri, M. (2016). Lessons (Really) Learned? How to Retain Project Knowledge and Avoid Recurring Nightmares: Knowledge Management and Lessons Learned. Paper Presented at PMI® Global Congress, Barcelona, Spain.
17. Eliufoo H.K. (2017). Post-Project Review and Organizational Learning: A Reflection of Building Contractors Practices, Management, Vol. 7 No. 5, pp. 161-167.
18. Ferrada X et al, (2015). A Lessons-learned System for Construction Project Management: A Preliminary Application. Procedia - Social and Behavioral Sciences pp302 – 309
19. Fong S.W. and Yip C.H. (2006). An Investigative Study of the Application of Lessons Learned Systems in Construction Projects, Journal for Education in the Built Environment, Vol 1, No.2, pp 27-38.
20. Graham, B. Thomas, K. (2007) Lessons Learned Practices: Case Study of a Leading Irish Construction Organization. In: Construction Management and Economics 25th Anniversary Conference, 16-18 July 2007, University of Reading.
21. Gray, M. (2009). How to Teach a New Dog Old Tricks. Paper Presented at PMI® Global Congress, Amsterdam, North Holland, The Netherlands.
22. https://articles.uie.com/kj_technique : (accessed: 08/01/2018 1540hrs)
23. https://project-management.com/affinity-diagram-kawakita-jiro-or-kj-method/ (accessed 1546hrs, 8th January 2018)
24. Ilie G. and. Ciocoiu C.N, (2010). Application Of Fishbone Diagram to Determine the Risk of an Event with Multiple Causes Management Research and Practice Vol. 2 No. 1

25. Ilyas, M. A. B., Hassan, M. K., & Ilyas, M. U. (2014). The art and science of PPRs. Paper presented at PMI® Global Congress, Dubai, United Arab Emirates.
26. Jainendrakumar T.D. (2015). The Essence of PMBOK. PM World Journal, Vol. 4, No. 11.
27. Jugdev K, (2012). Learning from Lessons Learned; Project Management Research Program. American Journal of Economics and Business Administration, Vol. 4 No. 1 pp13-22.
28. Kendrick, T. (2008). Avoiding Black Swans: Managing Risks Using the PERIL Database. Paper Presented at PMI® Global Congress, Denver.
29. Kinser, J. (2008). Why Less is More—the Backpacker's Approach to Project Management. Paper Presented at PMI® Global Congress, Asia Pacific, Sydney, New South Wales, Australia.
30. Larson E.W , Gray C.F (2011). Project Management: The Managerial Process- 5th Edition. McGraw-Hill/Irwin, New York.
31. Lazar, O. & Serono, M. (2010). Project Closing Process: Modular Risk-Based Closure. Paper Presented at PMI® Global Congress, Milan, Italy.
32. Lazar, O. (2014). Sustainability vs. Amnesia: From lessons logged to lessons learned. Paper presented at PMI® Global Congress, Phoenix, A Z.
33. Lehtinen, T. Mika M. (2011). What rae Problem Causes of Software Projects? Data of Root Cause Analysis of Four Software Companies. Proceedings of the 5th International Symposium on Emperical Software Engineering & Measurement, Banf AB, Canada.
34. Lomas J. (2007). The In-Between World of Knowledge Brokering. BMJ: British Medical Journal. Vol. 334 No. 7585 pp 129-132.
35. Love P, Teo P., Morrison J, (2012). Building Absorptive Capacity in an Alliance: Process Improvement Through Lessons Learned. International Journal of Project Management, Vol. 30 No.1.
36. Love P. *et al*, 2016. Building Absorptive Capacity in an Alliance: Process Improvement Through Lessons Learned. International Journal of Project Management, Vol. 34 pp1123-1137.
37. Marlin M, 2008. Implementing an Effective Lessons Learned Process in a Global Project Environment .2nd Annual Project Management Symposium Proceedings –Dallas, Texas

38. Morfin, E. (2005). New rules for Problem- Solving on Projects. Paper presented at PMI® Global Congress 2005, North America, Toronto, Ontario, Canada.
39. Nel H. and Pretorius J. (2017). Benchmarking for the Design of a Lessons Learned System in Project Quality Management. Proceedings of the International Conference on Industrial Engineering and Operations Management. Rabat, Morocco.
40. Newell, S. et al (2006). Sharing Knowledge Across Projects - Limits to ICT-led Project Review Practices.
41. Nikoletta T. et al. (2016). The Role of Transferring Knowledge in Case of Non-Business Sector Projects. Procedia - Social and Behavioral Sciences. 221. 226-235.
42. Olaniran, O. J. (2017). Barriers to Tacit Knowledge Sharing in Geographically Dispersed Project Teams in Oil and Gas Projects. Project Management Journal, Vol. 48 No.3, pp 41–57.
43. Paranagamage, P., Carrillo, P.M., Ruikar, K.D. (2012). Lessons Learned Practices in the UK Construction Sector: Current Practice and Proposed Improvements. Engineering Project Organization Journal, Vol. 2 No.4, pp.216-230.
44. Piantanida, M., Cheli, E., & Marini, F. (2010). Integrating the lessons learned process. Paper presented at PMI® Global Congress 2010—EMEA, Milan, Italy. Newtown Square, PA: Project Management Institute.
45. Pinto J (2010). Project Management: Achieving Competitive Advantage-2nd Edition. Prentice Hall.
46. Power R. Cormica K. (2015). Towards Effective Knowledge Transfer in High-Tech Project Environments: Preliminary development of Key Determinants. Procedia Computer Science. Vol 64, pp. 17-23
47. Prinsloo, J.W., Vvan Waveren, C.C., & Chan, K.Y. (2017). Factors That Impact Knowledge Dissemination in Projects. South African Journal of Industrial Engineering, Vol. 28 No.1, pp 1-11.
48. Project Management Institute (PMI). (2013). A guide to the Project Management Body of Knowledge – 5th edition. Newtown Square.
49. Project Management Institute (PMI). (2015). Capturing the Value of Project Management through Knowledge Transfer. Newtown Square, PA: Project Management Institute

50. Rowe, S. F. & Sikes, S. (2006). Lessons Learned: Taking it to the Next Level. Paper Presented at PMI® Global Congress 2006—North America, Seattle, WA. Newtown Square, PA: Project Management Institute.
51. Rowe, S. F. (2007). Lessons Learned: Taking it to the Next Level. Paper Presented at PMI® Global Congress 2007—EMEA, Budapest, Hungary. Newtown Square, PA: Project Management Institute.
52. Shand, D. (2002). Real-Time Reviews. PM Network, Vol. 16 No.12, pp 34–36.
53. Shindler M, Eppler M. (2003). Harvesting Project Knowledge: a Review of Project Learning Methods and Succcess Factors. International Journal of Project Management. Vol 21
54. Sullivan G. and Artino R. (2013). Analyzing and Interpreting Data from Likert-Type Scales J Grad Med Educ. Vol 5. No.4 pp 541–542.
55. Tichapondwa M. S., (2013). Preparing Your Dissertation at a Distance: A Research Guide. Virtual University for the Small States of the Collllonwealth– Vancouver.
56. Trevino, S. A. & Anantatmula, V. S. (2008). Capitalizing from Past Projects: The Value of Lessons Learned. Paper Presented at PMI® Research Conference: Defining the Future of Project Management, Warsaw, Poland. Newtown Square.
57. Von Zedtwitz M., (2002), Organizational Learning through Post Project Review in R&D, Blackwell Publisher Limited, USA.
58. Walker, L. W. (2008). Learning lessons on lessons learned. Paper presented at PMI® Global Congress 2008—North America, Denver, CO. Newtown Square, PA: Project Management Institute.
59. Weber *et al*, 2000. Categorizing Intelligent Lessons Learned Systems, AAAI Technical Report WS-00-03.
60. Wiewiora, A., Chen, L., & Trigunarsyah, B. (2010). Inter- and Intra-Project Knowledge Transfer: Analysis of knowledge Transfer Techniques. Paper Presented at PMI® Research Conference: Defining the Future of Project Management, Washington, DC. Newtown Square, PA: Project Management Institute.
61. Williams, T. (2008). How Do Organisations Learn Lessons from Projects—and Do They? IEEE Transactions on Engineering Management, Vol. 55 No.2, pp 248–266.

62. Wysocki R. (2014) .Effective Project Management: Taditional, Agile, Extreme, 7th Edition. John Wiley & Sons In, Canada
63. Yin R (2009). Case Study Research: Design and Methods-4th Edition. Sage Publications.
64. Yuan J. and Skaik, S. (2014). Lessons Learned Practices in the UAE Construction Industry, in CIB, Proceedings of the 2014 International Conference on Construction in a Changing World, CIB, Dambulla, Sri Lanka, pp. 1-12.

APPENDIX 1: SAMPLE RESEARCH QUESTIONNAIRE

Introduction

This study is conducted in partial fulfillment of a Master in Project Management at The University of Botswana by Patience Chika. The title of the research is "The Effectiveness of Gathering and Utilisation of Lessons Learnt (LL) from Projects by Botswana Tourism Organisation (BTO)". Please assist by completing the questionnaire. Completing the questionnaire is purely voluntary, there are no direct benefits for the participants, however, it is hoped that through your participation the benefits of improved project learning will accrue to the organisation.

SECTION A: Respondents' Profiles

1. Which BTO construction projects have you been involved in?
   - ☐ Lepokole Nature Reserve
   - ☐ Tsabong Ecotourism Park
   - ☐ Goo-Moremi Resort
   - ☐ Seboba Recreational Park
   - ☐ Qchwihaba Caves

2. Which of the following best describes your role in the projects that you were involved in?
   - ☐ Portfolio Manager
   - ☐ Project Manager
   - ☐ Site Manager
   - ☐ Project Officer
   - ☐ Project Admin
   - ☐ Other (Please specify) …….

SECTION B: Management of Lessons Learned

3. What is usually the emphasis of the lessons learned process?
   - ☐ Good practice
   - ☐ Bad practice
   - ☐ Combination of good and bad practice

4. Rate the following possible reasons for conducting lessons learned in BTO.

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
To learn for similar projects in the future					
To avoid repeating mistakes					
To provide a competitive edge over other organisations					
To improve on consecutive stages of ongoing projects					

5. What processes were used in the project(s) you were involved in to C***apture*** lessons learned?

   ☐ Meetings ☐ Workshops ☐ Project audits

   ☐ Logs/diaries ☐ Independent Facilitator ☐ Other, please specify……...

6. Who were the participants in the capturing of the lessons?

   ☐ All project team members

   ☐ Managers only

   ☐ Project officers only

7. At what stage of the project were the lessons captured?

   ☐ After project completion

   ☐ At the end of each phase

   ☐ At each the end of each milestone

   ☐ After the occurrence of an incident

8. Please rate the effectiveness of the techniques used by BTO to capture the lessons.

	Very Effective (5)	Effective (4)	Neutral (3)	Ineffective (2)	Very Ineffective (1)
Meetings					
Workshops					
Project Audits					
Logs/diaries					
Independent Facilitator					
Other (As specified above)					

9. What techniques were used to ***Analyse*** the lessons for the projects you were involved in?

- ☐ Brainstorming
- ☐ Cause-Effect Analysis
- ☐ Root Cause Analysis
- ☐ Other, please specify …….
- ☐ None

10. Please rate the effectiveness of the lessons storage techniques used.

	Very Effective (5)	Effective (4)	Neutral (3)	Ineffective (2)	Very Ineffective (1)
Brainstorming					
Cause-Effect Analysis					
Root Cause Analysis					
Other (As specified above)					

11. What techniques were used to ***Store*** lessons for the projects you were involved in?

- ☐ Lessons learned reports
- ☐ Lessons learned database
- ☐ BTO website
- ☐ Other, please specify…….

12. Please rate the effectiveness of the lessons storage techniques used.

	Very Effective (5)	Effective (4)	Neutral (3)	Ineffective (2)	Very Ineffective (1)
Lessons learned reports					
Lessons learned database					
BTO website					
Other (As specified above)					

13. What techniques were used to ***Disseminate*** captured lessons for the projects you were involved in?

- ☐ Document distribution
- ☐ Electronic database/repository
- ☐ BTO website
- ☐ Email distribution
- ☐ Lessons learned meetings
- ☐ Other, please specify…….

14. Please rate the effectiveness of the lessons dissemination techniques used.

	Very Effective (5)	effective (4)	Neutral (3)	Ineffective (2)	Very Ineffective (1)
Document distribution					
Electronic database/repository					
BTO website					
Email distribution					
Lessons learned meetings					
Other (As specified above)					

15. What techniques were used to ***Infuse*** lessons for the projects you were involved in?

- ☐ Having central lessons learned person for a project
- ☐ Making it mandatory to complete a lessons learned checklist for each project
- ☐ Social Platforms
- ☐ Other, please specify……...

16. Please rate the effectiveness of the lessons infusion techniques used.

	Very Effective (5)	effective (4)	Neutral (3)	Ineffective (2)	Very Ineffective (1)
Having central lessons learned person for a project					
Making it mandatory to complete a checklist for each project					
Social Platforms					
Other (As specified above)					

SECTION C: Barriers to LL Management

17. What do you perceive to be the barriers to effective implementation of lessons learned processes in BTO?

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
Lack of time					
Lack of resources					
Lack of clear guidelines					
Lack of management support					
Lack of technical infrastructure					
Fear of blame for mistakes					

Thank You for Your Time.

APPENDIX 2: RESESARCH PERMIT

TELEPHONE: 3914955
TELEGRAMS: MENT
TELEX:
TELEFAX: 3951092
REF: ENT 8/36/4 XXXXII (37)

REPUBLIC OF BOTSWANA

MINISTRY OF ENVIRONMENT, NATURAL RESOURCES CONSERVATION & TOURISM
PRIVATE BAG BO 199
GABORONE
BOTSWANA

ALL CORRESPONDENCE MUST BE ADDRESSED TO
THE PERMANENT SECRETARY

Patience Chika
P O Box 403086
Gaborone
Botswana.

13th June 2018

email:- patiencephlp@gmail.com

Dear Sir/ Madam,

RESEARCH PERMIT: PATIENCE CHIKA

We are pleased to inform that you are granted permission to conduct research, for a study entitled **("The effectiveness of Management of Lessons Learnt from Botswana Tourism Organisation (BTO) Construction Projects")**

The research will be conducted in these areas **– Gaborone and Surrounding for the Research Field Work.**

This permit is valid from the **01th June 2018** to **31st December 2018 (Seven Months only)**

This permit is granted subject to the following **conditions:**

1. The permit does not give authority to enter premises, private establishments or protected areas. Permission for such entry should be negotiated with those concerned.

2. You conduct the study according to particulars furnished in the approved application and / or proposal taking into account the **above conditions**.

3. Government of Botswana shall be duly acknowledged in **all research outputs**.

4. Copies research outputs from the study shall be deposited directly with Department of Wildlife and National Parks and Ministry of Environment, Natural Resources Conservation & Tourism HQ.

5. Failure to comply with any of the above conditions may result in the **immediate cancellation of this permit**.

6. This permit is **not transferable**.

Yours Faithfully

Diiro K. Modibedi
FOR / PERMANENT SECRETARY

cc. Regional Wildlife Officer – Gaborone
Director, Department Of Wildlife National Parks

APPENDIX 3: INTERVIEW TRANSCRIPT

Interviewee : PM

Interviewer : PC

Date of Interview : 12th March 2018

Place of Interview : BTO Head Office, Gaborone

List of Acronyms : PC= Patience Chika, PM= Project Manager

Begin Transcript 1400hrs

PC: As per our telephone conversation, this interview is a follow-up after the questionnaire you and other respondents within BTO completed. It appears BTO uses mostly meetings to capture lessons learned from projects. Why are meetings the most preferred option?

PM: we use project meetings for briefings, mostly because of their convenience; they are easy to organise, have no cost attached, unlike for instance workshops, which are costlier but serve the same purpose as meetings.

PC: You also use audit reports to capture project lessons. Does the organisation undertake audit for each project completed, and can I view at least one audit report for appreciation?

PM: Well, we do not do audits specifically for projects, the audits are done as part of the general audit process for BTO, but sometimes the audits do pick project issues we can learn from, so they are also an important source. Unfortunately, the audits are confidential and cannot be shared.

PC: For analysis of lessons, the questionnaire results show that you only use simple brainstorming. Does simple brainstorming give you the desired information such as specific causes and results of incidents?

PM: In my opinion the brainstorming, sessions are quite helpful as we are able to identify issues and come up with possible solutions, but I do acknowledge that a more organized session could give better results.

PC: Why have other more organized techniques such as RCA and Cause-Effect analysis not used?

PM: I guess it is just that no one has ever suggested that we use them but it is really worth looking into for our future projects.

PC: The results show use lessons learned reports for storage of lessons. I have reviewed a number of your project documents and have not seen a dedicated LL report. Why is that the case?

PM: Well, we do not have specific LL reports; sometimes we capture the lessons in our site meeting minutes or evaluation meeting minutes. That is where we extract the lessons.

PC: What kind of documents to you distribute as part of dissemination of lessons for past projects?

PM: we distribute minutes mostly, and sometimes just direct emails to the project team, just advising them on areas that need improvement, drawing from previous projects or phases.

PC: Do you have any plans do develop a LL database, noting that it could greatly assist in project learning in the organisation.

PM: The database would without a doubt improve our project learning, we will look into engaging our IT department on that matter.

PC: Please explain how your teams use social platforms to infuse past project lessons?
PM: We do create "whatsapp" for each project, and we use them to communicate any issues, it really helps with speedy communication. But the challenge is that these groups are not really official, and we do get instances where other project team members are not willing to be part of the groups.

PC: is it the Organisation's policy or it just happens?
PM: The groups are just an informal arrangement that happens on an adhoc basis.

PC: Please briefly explain how lack of time, management support and clear guidelines impede project learning for your projects, these factors appear to be the most highlighted by your team.

PM: Well, lack of time is a challenge because first of all not all the project team members are based in Gaborone, so getting them together to do the project reviews is a challenge, furthermore they belong to other departments. In terms of guidelines, BTO does not have any guidelines in place for project learning, if there were there, it would be easier since all projects would be following set project learning processes; in terms of management support, management does support execution of projects but the emphasis seems to be in the actual delivery of the projects itself rather than on what happens post the project.

PC: Thank you so much for your time, the interview has really given me more in-depth into your processes.
PM: You are welcome, please do share your findings once you are done, it would really help us.

End of Interview: 1430hrs