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Successful Information Technology Project Process Management Best Practices

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This is to certify that the doctoral dissertation by

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Walden University
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Abstract

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Dissertation Submitted in Partial Fulfillment

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Abstract

Globally, most information technology projects (ITPs) are reported as unsuccessful. Poor project management practices have consistently been identified as the leading cause of ITP failures. However, ITP practitioners manage project processes in diverse ways without clear guiding principles in terms of what does or does not work in practice for success. Process management practices in projects were explored in this grounded theory qualitative study from a systems theory perspective. The purpose was to understand from project practitioners' experiences what guiding principles potentially influenced ITPs to success. These experiences were then analyzed to develop a theory describing how to best use processes management in projects to achieve success. The main research question addressed in this study examined participants' view of practices in successful ITPs that effectively led to success. The data were collected during in-depth interviews of 14 project participants using semistructured questions and were coded using the grounded theory continuous-comparison approach until theoretical saturation and themes were generated. The finding is an emergent theory, which indicates that practices in ITP process management consisting of continuous learning, regular engagement, constant surveillance, process orchestration, and timely response positively impacts a successful outcome. Leveraging this finding, process management principles are recommended to better understand ITP process management in practice. This study contributes to positive social change by providing a guide for practitioners' use, potentially resulting in more successful educational and healthcare ITPs, especially in Africa.

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Dedication

I am highly indebted to Almighty God for allowing me to contribute to his extraordinary work of creation. This research is dedicated to God and to my family.

Acknowledgments

I want to thank everyone who contributed in one way or another to the successful completion of this dissertation. In a special way, I would like to thank my family, in particular my mum (Virginia), my wife (Agatha), and my children (Mmasi, Somtoo, Jessica, and Kamsi), and my siblings for their unflinching love. Indeed, without my wife's constant support, I would have dropped out! I am also grateful to my Chair (Dr. Shriner), my Second Committee Member (Dr. Barton), and my URR (Dr. Goodman) for their dedication in guiding me. Finally, I would like to thank Ayo, Adil, Indradip, Henry, Jennifer, Jonathan, and Leslie, for their encouragement.

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Chapter 1: Introduction to the Study

Researchers have consistently identified poor project management practices as the leading cause of information technology project (ITP) failures (Hughes, Rana, & Simintiras, 2017). An ITP is successful upon satisfactory realization of the defined benefits through the timely delivery of the required IT services or products scope, and within budget (Varajão, 2016). Project process management practices were explored in this study from a systems theory perspective to understand from project practitioners' experiences what guiding principles potentially influenced ITPs to a successful outcome. In this chapter, the background of this research is reviewed, followed by the problem statement, and the purpose of the study. Next, the research questions, conceptual framework, and the nature of the study were detailed. Finally, a preview of key definitions, research assumptions, scope, delimitation, limitations, and significance of this study were included.

Background of the Study

Unsuccessful information technology projects adversely impact investors' confidence in organizations, resulting in a potential decline in IT investments to support developments in society. Unsuccessful projects are usually projects which were not completed or was abandoned; hence they did not meet the defined requirements often due to challenges in its implementation (Lauesen, 2020). Organization's sustainability is associated with its ITP's success (Varajão et al., 2018). Hughes, Rana, and Simintiras (2017) found that ITP success factors may differ from other projects and that poor management is the main cause of ITP failure. To meet project expectations, practitioners

have increasingly relied on internationally recognized project management guides. Such guides include the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK) defined by PMI (Hidding & Nicholas, 2017). In the PMBOK, 49 project processes across 10 knowledge areas were identified as essential for project management. The knowledge areas include schedule management, cost management, scope management, integration management, communications management, risk management, procurement management, resource management, quality management, and stakeholder management knowledge areas (PMI, 2017). Just as in business processes, the processes in project management are interrelated and interact. The output from one process is used as an input into another process during the project life cycle, thereby potentially influencing project outcome (Bruno, 2015; PMI, 2017). The processes are then managed using specific guiding principles in their effort to achieve success, which practitioners could best describe. Hidding and Nicholas (2017) highlighted a research opportunity to evaluate how such project management practices applied in ITPs influence its success or failure. The relevance of process management practices in project management is essential as demonstrated in the PMBOK.

Leaders of PMI elaborated in the PMBOK that the interaction between the processes is important for success; however, they could not detail how. It was not identified in the PMI's PMBOK any specific knowledge area or process as most important for success. Project managers must decide for each project what knowledge areas to develop further than others. Hence, the practice of process management in ITPs

could vary among project managers, and in turn, influence how the process and their relationships are prioritized.

Herrera et al. (2020) argued that processes were defined in PMBOK in a manner that suggests less dependency on other factors other than simple input and output relationships. The simple process input and output relationship described in PMI was perceived as insufficient, especially from a system thinking perspective. Herrera et al.'s research was based on the philosophy that processes could be viewed from a systems perspective, such that more interactions among processes during project management possibly impact the outcome. Such interactions could be coming from the fact the projects are planned and executed in organizations, which also exhibit systems characteristics. To learn more about project practices, some researchers focused on project processes with a view of understanding relative importance or mostly implemented process (Varajão et al., 2017). For instance, Varajão et al.'s (2017) study identified the mostly implemented ITP processes with a limited focus on the influence of the process management practices on ITP towards improvements. A key characteristic of a project is that it is not repeatable; hence the thought of projects as processes is not common.

The nonrepeatability of projects often makes projects seem very different from processes. Although projects are not repeatable, Abyad (2018) viewed them as repeatable processes, indicating that process management practices could be tailored to project management. Chmielarz and Zborowski (2018) argued that projects could be viewed as processes in organizational processes, which are on themselves of high-risk, unique,

pragmatics and strategic. In a sense, processes are executed in a manner projects are executed, except that they are repeatable.

Abyad (2018) reviewed project management, describing how motivation theories could be applied in project process management practices. Herrera et al. (2020) elucidated that the mechanism supporting the interaction of processes should be identified in practice. For example, an alert mechanism, which serves as feedback to the project managers for action, could be positioned appropriately to correct and strengthen process interactions in practice (Herrera et al., 2020). Perrier et al. (2018) also found out that corrective actions through feedback mechanism are central to project control.

Abyad (2018) further elucidated that the purpose of a project is to achieve success. To be successful, a project is expected to satisfactory realize the predefined benefits for which it was initiated, through its timely scope delivery and within budget (Varajão, 2016). Therefore, one of the critical roles of the project manager is identifying what motivates the project team and defining a strategy to sustain the motivation towards success. Such strategies may include the systems thinking best practices that ensure project survival and how to manage feedback.

Process management practices vary among project managers who have the responsibility to identify and prioritize processes that potentially influence project stability throughout its lifecycle towards success (Abyad, 2018; Herrera et al., 2020). Ross Ashby's (1956) theory of adaptive systems illuminated that a system's survival and stability necessitates the use of feedback mechanisms, which could be likened to a project team's motivation principles, with an ITP viewed as a complex system (Abyad, 2018;

Umpleby, 2009). Practices in project management could include adequate training, positive feedback, and a sense of task ownership (Abyad, 2018).

ITP management has evolved, yet there remain limited underlying theories or guide of how the processes fit together or which processes are more success-critical than others (Padalkar & Gopinath, 2016; PMI, 2017). Poveda-Bautista et al. (2018) argued that ITPs are unique and complex, and that the level of their complexity could influence their outcome. Process management practices are based on a theory consisting of strategy, modelling, and implementation, monitoring, and controlling elements (Meerkamm, 2010).

Understanding project practices from process management perspective has not received sufficient grounded research studies. There remain a lack of consistency and clarity on the cause of project failures owing to inadequate grounded theories in project management, although there are tools and techniques (Padalkar & Gopinath, 2016; Shepherd & Atkinson, 2011).

Problem Statement

Standish Group report (as cited in Iriarte & Bayona, 2020) shows that a third of ITPs were either abandoned or canceled, while about a half failed to deliver on expected functionality and had cost or time over-runs. ITPs are unique and often complex (Poveda-Bautista et al., 2018). In the last decade, ITP management practices studies show inconsistent findings regarding what practices influence a successful outcome (Hidding & Nicholas, 2017; Iriarte & Bayona, 2020). Padalkar and Gopinath (2016) found a lack of clarity on the cause of project failures was due to inadequate theories surrounding how to

manage projects best, while Iriarte and Bayona (2020) argued that project management practices based on specific principles or attributes could have influenced success. PMI's leadership described a project as a temporary organization encompassing interacting yet related processes (PMI, 2017). In describing a project in relation to processes, PMI's leadership provided a limited theoretical guide on managing the processes interactions best in terms of what works in practice for a successful outcome. Herrera et al. (2020) studied project process interactions and found that effective management of the processes could improve project outcomes. Niederman et al. (2018) developed a process theory model for knowledge accumulation in the project management field and suggested broader practice-based theory research to improve practice. Varajão et al. (2017) found inconsistencies in the process management practices among ITP practitioners, possibly due to a lack of clarity or guiding principles on what works or does not work. Project management has evolved with limited underlying theory or guide of how the processes fit together or which processes are more success-critical than others (Padalkar & Gopinath, 2016; PMI, 2017). There are tools and techniques with limited foundational theory to support best practice (Shepherd & Atkinson, 2011).

The general problem was that investments in ITPs improve human quality of life and stimulate economic growth in society (African Development Bank, 2018). Also, an organization's success and sustainability is associated with its ITP's success (Varajão et al., 2018). Yet over two-thirds of ITPs were not successful, mainly due to project management practices. The specific problem was that ITP practitioners manage project

processes in diverse ways without clear guiding principles in terms of what does or does not work in practice to make ITPs successful (Herrera et al., 2020).

Purpose of the Study

The purpose of this qualitative grounded theory study was to explore project process management practices of practitioners in successful ITPs and develop a theory describing how to best use project management processes in practice to achieve success. A project organization is temporary, made up of complex, interacting processes executed by practitioners over a given period to deliver a product or service (PMI, 2017; Wilson, 2015). In a nonproject organization, business process management practices are based on a theory consisting of strategy, modeling, implementation, monitoring, and controlling elements (Vuksic et al., 2016).

Research Questions

The general research question that was administered for this qualitative study was: What practices in process management do information technology project practitioners rely upon as guiding principles in a successful information technology project?

RQ1. How do project practitioners describe process management elements and process purpose in successful information technology projects?

RQ2. How do project practitioners describe process management feedback mechanisms, including the interactions among project processes, in successful information technology projects?

RQ3. What do project practitioners perceive as the best way to apply process management principles towards ensuring project survival, stability, and adaptability in information technology projects?

Conceptual Framework

The conceptual framework was guided through the lens of von Bertalanffy's (1972) general systems theory and Ross Ashby's (1956) general theory of adaptive systems. The conceptual framework relates to the ITP's process management, based on the concepts derived from von Bertalanffy's general systems theory and Ross Ashby's general theory of adaptive systems, consisting of a *social complex system*, *elements*, *purpose*, *interaction, feedback mechanism*, *survival*, *stability*, and *adaptability*. The conceptual framework is represented in Figure 1.

Figure 1 depicts an ITP as a social complex system of interconnected purpose-oriented processes. The thick up-point arrows, read as *supported by*, point from the expected best practices of the project practitioner to the anticipated behavior of the project throughout the entire project's life cycle. The thin single right-point arrow, read as *contribute to*, shows how interconnected ITP processes potentially directly contribute towards a collective process purpose. The thick right-point arrows, read as *leading to*, show the change that could be realized.

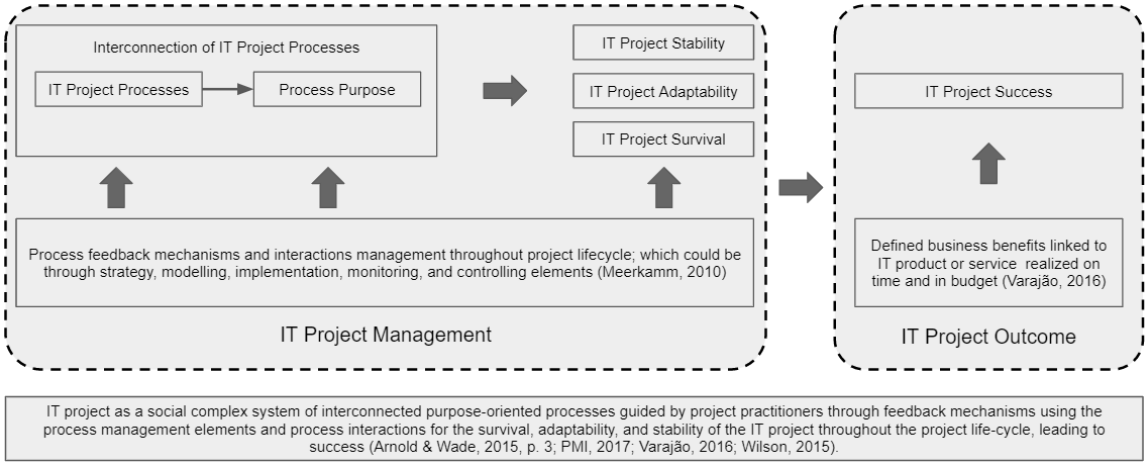
Processes are guided by project practitioners through feedback mechanisms using the process management elements and process interactions for the survival, adaptability, and stability of the ITP throughout the project life cycle, potentially leading to a successful outcome (Arnold & Wade, 2015; PMI, 2017; Varajão, 2016; Wilson, 2015).

The purpose of project management is to ensure success. A project is a collection of complex social activities (Walker & Lloyd-Walker, 2016). Hence, social theories could enhance project management research and unravel ITP management challenges (Floricel et al., 2014; Plokhov Dmitry et al., 2016). Social science and complex systems concepts have been used in project management research (Plokhov et al., 2016; Uddin, 2017).

The general systems theory was developed in the 1900s by von Bertalanffy (1972), which elucidated that the ability of a system to achieve the purpose of its existence is influenced by the interaction of the system's elements because they are inter-connected (Arnold & Wade, 2015; Sterman, 2001). Ross Ashby's (1956) general theory of adaptive systems extended the general systems theory focusing on systems dynamics to explore the mechanisms, in the form of feedback and interactions, which operate within the systems that ensure its survival, stability, and adaptability (Umpleby, 2009).

Figure 1

The Research's Conceptual Framework



Note. This figure shows the conceptual framework based on von Bertalanffy's general systems theory and Ross Ashby's general theory of adaptive systems. Created by J. O. Orazulike.

A conceptual framework is essential in the constructivist grounded study and provides a foundation for developing an emergent theory (Carlin & Kim, 2019; Dunne & Üstűndağ, 2020). The aforementioned conceptual framework describes the abstract principles that project practitioners potentially rely upon to guide process management towards achieving a successful information technology project and how best to apply them (Dunne & Üstűndağ, 2020).

Nature of the Study

The nature of this research was a qualitative study, using a grounded theory methodology, with a focus on exploring processes management practices of ITP practitioners in a successful ITP (Glaser & Strauss, 2017). The research participants were purposively selected from ITP practitioners specifically with the role of ITP manager. ITP practitioners who are present on the LinkedIn network were in the population.

To discover the best practices of process management in successful ITPs, identifying the guiding principles was performed to understand the nature of the process interactions in ITPs and the characteristics of the approaches used by the participants. An inductive approach was used to engage with the research participants through interviews, followed by a narrative analysis to identify relevant project process management patterns, themes, and trends iteratively through constant data comparisons. The study was carried out using Charmaz's (2006) grounded theory technique, whereby the participants

collaborate with the researcher to develop the theory. Charmaz's (2006) grounded theory research validation process was followed. The sample size was not predetermined; rather, the data analysis conclusion was reached at the point of theoretical saturation using a referral approach of participants' selection (Charmaz, 2006; Tie et al., 2019).

Definitions

Successful IT Project: An ITP is considered successful upon satisfactory realization of the defined benefits through the timely delivery of the required IT services or products scope and within budget (Varajão, 2016).

Unsuccessful IT Project: An unsuccessful project, also called a failed project, is a project which was not completed or was abandoned; hence it did not meet the defined requirements often due to challenges in its implementation (Lauesen, 2020).

Assumptions

This research was conducted based on specific assumptions. In this research, due to the limitation imposed by the research's time and scope, assumptions were considered. First, it was assumed that the research participants' opinions during the interview were truthful, and they fully understand the research's confidentiality. The second assumption was that the participants who volunteered to be interviewed as project managers were professional ITP practitioners. The last assumption was that the sampled number of participants was sufficient to assure the study's credibility.

Scope and Delimitations

This research was focused on developing a specific theory that describes the underlying process management practices that project practitioners implemented to help

achieve a successful ITP. The discovery of the substantive theory in the phenomenon was conducted through an in-depth exploration of the real-life experience and perceptions of ITP practitioners (Gill, 2020; Glaser & Strauss, 2017). To discover the process management best practices used in successful ITPs, identifying the guiding principles was performed to understand the nature of the process interactions in completed ITPs and the characteristics of the approaches used by the participants to manage projects towards success.

This research was conducted to develop a specific theory that describes the underlying process management practices and guiding principles that project practitioners implemented to achieve a successful ITP outcome. Through interviews, I explored sampled project practitioners' experiences to understand their perception of how best to identify, prioritize, coordinate, and use processes, including process interactions, to achieve successful ITP outcomes. The phenomenon in this research was the 'process management practices in a successful ITP.' Grounded theory was suitable for this research because it enabled an inductive and iterative discovery of substantive theory in the phenomenon through an in-depth exploration of the real-life experience and perceptions of ITP practitioners (Gill, 2020). To understand the phenomenon, I addressed the research questions of this study using Meadows (2008) system's thinking construct of *elements*, *purpose,* and *interactions,* within the context of process management principles in successful ITPs (Meadows, 2008). In this research, a successful ITP was the IT practitioner's perceived satisfactory realization of the project's business objectives through the timely delivery of the expected IT products and services (Varajão, 2016).

Limitations

There were barriers in this study, which included the difficulty in recruiting participants for interviews. There was also a limitation that this research's outcome may not be generalizable because qualitative research focuses on a small sample size, which prevents the outcome from being a sufficient statistical representation of the population.

Significance of the Study

The purpose of this qualitative grounded theory study was to explore project process management practices of practitioners in successful ITPs and develop a theory describing how to best use project management processes in practice to achieve success. A project is a collection of complex social activities (Walker & Lloyd-Walker, 2016); hence, social theories could enhance project management research and unravel ITP management challenges (Floricel et al., 2014; Plokhov Dmitry et al., 2016). The findings from this research could contribute to solving social problems related to ITP in society.

Significance to Practice

This study's findings provide a testable theory that may help fill the knowledge gap in process management practices in successful ITPs (see PMI, 2017; Varajão et al., 2017). The knowledge gained in this research will help practitioners to customize project methodologies by emphasizing the knowledge areas processes most relevant for ITP success (see Javed et al., 2015; Prodan, 2017).

Significance to Theory

This research outcome is expected to also improve ITP management knowledge on theoretical foundations regarding ITP processes for success, potentially minimizing

ITP failure (see Hughes, Rana, & Simintiras, 2017). This research is expected to contribute to filling the knowledge gap in ITP failure by understanding what works to enable ITP success when viewed through social theories (see Lehtinen et al., 2014; PMI, 2017).

Significance to Social Change

The outcome of this research could provide a process management model to ITP practitioners, that enhances ITPs' success rate and thereby potently increase project funding by the World Bank in line with their priorities for Africa towards improved health and education (see Ifc.org., 2018). This research outcome could also improve the success of ITPs executed by governments targeted at poverty reduction and job creation in the society (see Eja & Ramegowda, 2020), enhance growth in a knowledge driven economy, and contribute to positive social change (see Ojanperä et al., 2017).

Summary and Transition

This research adds to knowledge in the management of ITPs from a process perspective through the development of a substantive theory using a qualitative grounded theory research approach. In Chapter 1, the problem leading to this research was identified. In identifying the problem, both a specific and a general problem was defined, mostly regarding the low rate of ITP success and project management practices knowledge gaps. To further address the problem, the purpose statement was highlighted, and research questions specifically developed. The conceptual framework, which provided a lens to the research, was also defined, followed by the nature of the study. In this research, specific conditions such as assumptions, scope, delimitation, and limitations

of the study were stated. The research's significance was then stated with a focus on practical implication, theoretical contribution, and contribution to positive social change. In Chapter 2, a literature review is conducted, while in Chapter 3, the research methodology is discussed in detail. In Chapter 4, I present the results of the study and I close, in Chapter 5, with a discussion of how the study fits with the broader literature and practices.

Chapter 2: Literature Review

Investments in ITPs are anticipated to improve quality of life and stimulate economic growth (African Development Bank, 2018), yet over two-thirds of ITPs are not successful mainly due to project management practices. While project management has evolved, there remains limited underlying theory or guide of how the processes fit together or which processes are more success-critical than others (Padalkar & Gopinath, 2016; PMI, 2017). The specific problem was that ITP practitioners manage project processes in diverse ways without clear guiding principles in terms of what does or does not work in practice to make ITP successful (Herrera et al., 2020). The purpose of this qualitative grounded theory study was to explore project process management practices of practitioners in successful ITPs and develop a theory describing how to best use project management processes in practice to achieve a successful outcome.

This chapter includes an extensive synthesis of literature related to social theories application in project management, ITP management and processes interactions, project management best practices, and ITP success.

Literature Search Strategy

Selected articles relating to information technology (IT) project management and ITP success were researched. The objective was to learn about relevant research regarding successful ITP management from process management perspective in extant literature. Walden University library was searched using the keywords *information technology project success, project processes management, project best practices,* and *process interaction* in the databases Business Source Complete, Science Direct, and

SAGE Journals, as well as in the Thoreau multidatabase. To ensure exhaustiveness in the literature search, I combined the keywords *information technology project success* and *project process management*, as well as *information technology project management* and *process interaction*, and *information technology project management* and *best practices*. Since the strategy included a selection of literature mostly published in 2015 or later, the search algorithm was activated accordingly, while also limiting the search to peer-reviewed literature by activating the relevant checkbox. The objective of the literature search was to understand how project management in successful information technology has been reviewed in prior research, in particular the best practices regarding process management principles viewed from systems thinking perspective.

Conceptual Framework

The aim of this study was to develop a substantive theory, which helps in the understanding of process management practices in successful ITPs. The conceptual framework in this grounded qualitative study was guided through the lens of von Bertalanffy's (1972) general systems theory, and Ross Ashby's (1956) general theory of adaptive systems. Having a conceptual framework is essential in a constructivist grounded study and provides a foundation towards the development of emergent theory (Carlin & Kim, 2019; Dunne & Üstűndağ, 2020). A project is a collection of social activities and is complex in nature (Walker & Lloyd-Walker, 2016), hence the use of social theories could enhance project management research and unravel ITP management challenges (Floricel et al., 2014; Plokhov Dmitry et al., 2016). There have been an extensive use of social science and complex systems concepts in project management

research (Plokhov et al., 2016; Uddin, 2017). The conceptual framework in this study, which relates to ITP's process management, was based on the concepts derived from von Bertalanffy's general systems theory, and the Ross Ashby's general theory of adaptive systems, consisting of *social complex system, elements, purpose, interaction, feedback mechanism, survival, stability,* and *adaptability*. The conceptual framework depicts ITP as a social complex system of interconnected purpose-oriented processes guided by project practitioners through feedback mechanisms using the process management elements and process interactions for the survival, adaptability, and stability of the ITP throughout the project life cycle, potentially leading to a successful outcome (Arnold & Wade, 2015, p. 3; PMI, 2017; Varajão, 2016; Wilson, 2015).

The general systems theory was developed by von Bertalanffy (1972) in the 1900s. The general systems theory elucidated that the ability of a system to achieve the purpose of its existence is influenced by the interaction of the system's elements because they are interconnected (Arnold & Wade, 2015; Sterman, 2001). Ross Ashby's (1956) general theory of adaptive systems extended the general systems theory focusing on systems dynamics to explore the mechanisms, in the form of feedback and interactions, which operate within the systems that ensure its survival, stability and adaptability (Umpleby, 2009).

Literature Review

Information Technology Project Management Practices

Information Technology, innovational products, and services are deployed in many organizations to solve problems. The implementation of these services and

products are carried out in a one-off activity called a project, following specific management practices. The relevance and integration of sustainable development in project management practices further suggest that the practice of project management is receiving significant attention (Ivanov et al., 2020). Ng and Ho (2019) used the 80/20 principle to explain that ITP management practices could help to drive project success.

The leadership of PMI defined a project is "a temporary endeavor undertaken to create a unique product, service, or result" (PMI, 2017, p. 4). Project management 'best practices' concept are founded on the idea that certain project practitioner practices thematic are identifiable, which could be generalized to make rules and guidelines such that if replicated by other practitioners the outcome could be similar irrespective of the environment (Tereso et al., 2019). Knowing what practice works best could enhance success. Tereso et al. (2019) characterized project management practices in terms of tools and activities and found that certain practices featured more prominently than others in private organizations. Tereso et al. (2019) performed a survey among project practitioners to evaluate the most commonly used project management practices. Of the 79 project management tools and techniques included in their survey, Tereso et al. (2019) found that toolsets, such as Gantt charts, kick-off meetings, activity lists, update meetings, and baseline plans are the most used project management practices. Tereso et al.'s study was triggered by the low success rate of ITPs based on the Standish Group Chaos report. Walker and Lloyd-Walker (2016) also argued that the traditional approach to managing projects as reflected in prior research were centered on methodologies like the PMI's PMBOK, with the aim of delivering on budget, on time and within agreed

upon quality specification. Tereso et al. (2019) cautioned that organizations differ and as such the outcome from the use of each project practice may vary.

While best practices are embedded within project management profession, project management was defined differently by different authors and professional bodies. According to the British Standard for Project Management (BSPM) leadership, project management is the "planning, monitoring and control of all aspects of a project and the motivation of all those involved in it to achieve the project objectives on time and to the specified cost, quality and performance" (Berisha-Shaqiri et al., 2018). The definitions suggest that there is a common need to ensure control mechanism, adequate planning and monitoring process of projects towards success. Why then do ITPs continue to fail?

Extant literature exposed the relationship between project management practices and successful project outcome (Iriarte & Bayona, 2020). Richardson (2016) emphasized that there is a need to understand how project management could be effectively integrated and embedded in the organization practices and not only focus on project delivery. The idea does seem to encourage *projectisation* of organizations, ensuring that projects piece together with the organization as a whole. Remington and Pollack (2016) proposed a systemic pluralism approach to project management practices involving two components: "that project managers recognize the systemic nature of projects; and that they adopt a pluralist approach to the tools and theories they apply" (p. 1). Joslin and Müller (2016) identified the impact project management methodology could have on the success of various kinds of projects, including information technology projects. Floricel et al. (2014) through review of literature presented two major issues in the field of project

management, independently cutting across practical and theoretical approaches towards solving project management-oriented challenges. The idea behind Floricel's et al. research was the convergence of the practical approaches with the theoretical approaches using social theories. In particular, the Floricel et al. (2014) considered three social theories: activity theory, actor–network theory, and structuration theory as potentially beneficial to the understanding of project management practice problems. Iriarte and Bayona (2020) research argued for project management principles to be focused on specific soft management attributes such communication, support and commitment. Motivation practices, which include adequate training, positive feedback and a sense of task ownership, could enhance project success if applied in project management (Abyad, 2018).

Project best practices are founded on existing social approaches to problem solving. Lehtinen et al. (2014) found that to prevent project failure, it will be more effective to be project-specific and focus on the practices that cause failure, rather than the manifestations of the problem, which are usually only the symptoms. Lauesen (2020) proposed a similar approach of looking at practice-related root causes to adequately prevent ITP failure. Lauesen argued that ITP failure could be described as accidents and that investigation into such accidents ought to be carried out and published. Understanding the practices that cause failure or lead to success would amounts to proactively preventing such accidents occurrence in practice – which in my view could be best practices and potential guiding principles, which will be explored in this study.

Hidding and Nicholas highlighted that there is a research opportunity to evaluate how project management practices applied in ITPs influences its success or failure, stating that there are opportunities for further to gain insight into reliable management practices used by practitioners in ITPs that contribute most towards ensuring project success and which minimizes failure rates.

Regarding what works best in project management, Nathalie et al. (2019) compared the best practices in PMBOK, PRINCE2 and AACE, which are the most widely used project management standards, with a main focus on project control processes. Nathalie et al. (2019) study shows that significant improvement can be made in project management practices, irrespective of the standard, by focusing on project processes. Nathalie et al. (2019) study show that there are project processes that play impactful and significant linkage roles to ensure that project control is not excessively complex, namely 'Forecasting', 'Review the stage status', 'Control quality' and 'Change management' processes. Project complexity could be reduced by an effective tracking of input and output of the processes significant for control. While the study was limited to quantitative network analysis of the project control frameworks of PMBOK, the PRINCE2, and the AACE, there is an opportunity to understand from project practitioner's perspective the principles guiding process management and how these could influence project success.

According to Rajagopalan and Srivastava (2018), various ITP management techniques, including the traditional 'waterfall', the agile 'scrum', and the use of lean methodologies are essential at a higher-level for project management. At a granular layer,

continuous process improvement and applicable best practices encapsulated in individual management principles become highly relevant for project success (Rajagopalan & Srivastava, 2018). European Foundation for Quality Management (as cited in Rajagopalan & Srivastava, 2018) opined that companies seeking to achieve excellence in business focused on the 'enablers-processes-results' trio. Although Rajagopalan and Srivastava (2018) study relied on the 'enabler' element of the trio to understand what potentially leads to a project success; a further understanding of the 'processes' component of the trio could strengthen the project management practices from process management perspective.

Bloch et al. (as cited in Rajagopalan & Srivastava, 2018) stated that project managers deliver successful projects by focusing on, (a) stakeholder and strategy management, (b) engaging the right talents, (c) team building, and (d) executing with project management best practices. Rajagopalan and Srivastava (2018) acknowledged a limitation that the 'best practices' identified in their research is not exhaustive as it did not include generic factors that could be more specific to peculiar projects in certain organizations due to their uniqueness. Rosacker and Rosacker (as cited in Rajagopalan & Srivastava, 2018) underscore the relevance of studies targeted at best practices as they hold significant potentials for improving the delivery of successful information technology projects.

Despite the aforementioned research limitation linked to 'best practice'; it suffices to state that evaluation of project best practices could contribute to improvement in project performance. The idea of identifying best practices this research is aligned with

the ontological believes by researchers that project management could be enhanced with more knowledge from practical experience, potentially leading to projects success.

Successful Information Technology Project

Project success is a burning issue, as a high rate of ITP failure impacts transformation and growth of businesses in organizations. Standish Group report shows that a third of ITPs were either abandoned or cancelled, while about a half failed to deliver on expected functionality and/or had cost or time over-run (Iriarte & Bayona, 2020). Padalkar and Gopinath (2016) systematic literature review of projects carried out between the 1980s and 2015 shows that there is lack of clarity on the cause of project failures due to limited grounded theories in the field of project management. Padalkar and Gopinath (2016) posit that "project management literature is characterized by a rich tradition of multiple paradigms, perspectives, methodologies and streams of enquiry, and weak theories" (p. 1316). This argument was also supported by Eskerod et al. (2015). Pankratz and Basten (2018) believe that to understanding factors leading to success, it could be more effective to explore the phenomenon with grounded theory research.

Achieving success in IS projects is a permanent challenge, as IS project management must continuously adapt to IT evolution and changes in business processes (Bezdrob et al., 2020). This increases the need for specific processes and activities to manage success during a project (Takagi & Varajão, 2020). The PMBOK guide (PMI, 2017) addresses important concepts of project success, stating that success is related to project objectives and success criteria. However, it does not describe processes to deal with success during the project lifecycle, hence the need for the processes in this study.

Due to the high importance of ITP success, Varajão et al. (2018) proposed a phase consisting of processes in project management needed for success management implementation. Serrador and Turner (2015) argued that achieving project management success is also called 'project efficiency', meaning that the project schedule, scope and cost expectations are met. However, in their study of 1,386 projects Serrador and Turner (2015) found that there is a strong correlation between project efficiency and overall success of the project. Similarly, Radujković and Sjekavica (2017) distinguished project management success from project success, stating that while project management success refers to the performance in terms of time, cost and quality; project success addresses how well the expected goal of the project is achieved. Millhollan and Kaarst-Brown (2016) argued that ITP success measure should not be focused on only the influence of project manager, or the project outcome or the project management processes, rather on the intersection of these measures. Although this study looked at project management processes, the practices underlying the practices that could lead to success were drawn from the skills that the project practitioners possess.

The *iron triangle* of cost, scope and time as success criteria has been in use since the 1980s, although various researchers have faulted it as being weak and insufficient considering current complexities in projects (Prostejovska & Tomankova, 2017; Sulistiyani & Tyas, 2019). Pankratz and Basten (2018) viewed IT success criteria as a black-box indicating that much is unknown. Hughes, Rana, and Simintiras (2017) also acknowledged that the historical use of cost, time and quality as criteria for measuring project success is not adequate since the element of stakeholder satisfaction is not

considered. A systematic literature review of success factors in ITPs show no common consensus on ITP success concepts, although success criteria were mainly related to budget performance, time to deliver, project management practices, quality of delivery, user satisfaction, and economic value addition (Iriarte & Bayona, 2020).

Measuring project success requires identifying the right persons to define success criteria. In this regards, Davis (2018) presented a model to enhance project success measurement consisting of perception from multiple stakeholders. Davis's (2018) model shifted project success criteria beyond the traditional iron triangle of time, budget and quality, to include accountability and the opinion of different stakeholders' groups' on benefits of the projects; while Sulistiyani and Tyas (2019) defined additional dimensions and added product quality, and stakeholder acceptance and benefit to organization. Prostejovska and Tomankova (2017) advocated the consideration of other contextual factors depending on the type of project and the complexity. Stakeholder's satisfaction was one example, which could define success in case of small projects. Swartz (2008) focused on the relevance of stability in projects as criteria in defining success, in particular, evaluating expectation in terms of health status of a project during implementation and not to wait for project completion before measuring success.

Hidding and Nicholas (2017) reviewed success measurement of ITPs proposing a change in ITP management thinking to a new paradigm to improve ITP performance. Hidding and Nicholas opined a new approach which will combine the principles of Value-Driven Change Leadership (VDCL) and Project Management Body of Knowledge's (PMBOK) principle to enhance ITP success. Hidding and Nicholas

explored data from ITPs and compared their proposed VDCL approach with the traditional approaches to project management and paradigms. According to Hidding and Nicholas, VDCL is based on three principles, namely, (a) emphasis on process performance measurement and more on the projects' value or results on business (b) controlling business cases until completed instead of abandoning them, and (c) de-emphasizing risk listing an focusing on the potential impact of the risk financially on business. While Hidding and Nicholas described the PMBOK principles to be based on managing of activities and charts to achieve on-time on budget project delivery, they argue that the VDCL component will enhance value delivery yet achieve on-time on-budget objective. Hidding and Nicholas tested their proposed approach using 16 completed ITPs (eight successful and eight unsuccessful) all selected from Chicago USA by comparing their performance against the model (VDCL-PMBOK). Hidding and Nicholas found that success factors for the ITPs were associated with the VDCL-PMBOK model. Closely related to the VDCL-PMBOK model are the five project success criteria identified by Joslin and Müller (2016), which include namely, project efficiency, impact on the society, potentials for the future, stakeholders' satisfactions, and benefit to the organization.

ITPs fail due to certain causes. Padalkar and Gopinath (2016) found that there is limited emphasis on scope management area despite 'scope creep' being cited as one of the main reasons why ITPs fail. Richardson (2016) argue that large organizations are investing a lot into project management office (PMO) as a way to remedy technology project failure, while SMEs are venturing into formalizing project management

techniques for the same reason. According to Richardson, technology projects are unsuccessful due to (a) inadequate support from top management, (b) poor project management, and (c) poor or unclear prioritization of the portfolio. Hence, the relevance of project management best practices in ITP success is underscored.

Hughes, Rana, and Simintiras (2017) on the other hand focused on high rate of information system project failure and how to remedy it. The purpose of Hughes, Rana, and Simintiras (2017) research was to (a) evaluate the key factors responsible for project failures and primarily area that can significantly boost project success, (b) explore factors that impact performance of project management, and (c) from practitioner perspective, discuss issues that organizations face while integrating changes to project management. Hughes, Rana, and Simintiras (2017) found common factors that lead to project failure, namely change management inadequacy, insufficient requirements management process, poor project planning and management practices, failure in risk management, among others.

Hughes, Dwivedi, and Rana (2017) carried out a research using interpretive ranking approach through systematic review of literature and websites. They identified and compared prominent IS failure factors within PRINCE2 project stages, such as poor communication, poor project management, poor change management, etc. with the aim of providing a framework to guide senior managers on project improvement decision making. Hughes, Dwivedi, and Rana (2017) believed that an understanding of specific failure factor's impact on a particular project lifecycle stage will help project managers identify early project failure. Hughes, Dwivedi, and Rana (2017) found out that IS project

failure is inevitable, and only approach is to "adopt a *practical pessimistic* mindset and pay specific attention to these key factors at an early stage in the project" (p. 787). Hughes, Dwivedi, and Rana (2017) study suggests that an understanding of the principles and practices that guide project managers in delivering projects successfully could conceptualized as a framework. While their research exposed the failure factors within the PRINCE2 project stages, there is an opportunity to evaluate principles practices specific to project management processes holistically.

Lehtinen et al.'s (2014) also carried out a quantitative analysis to evaluate software project failures causes. In their research, Lehtinen et al. (2014) sought to understand causes of project failure and identified the main causes to be inter-related, and also associated with project processes. According to Lehtinen et al. (2014), project failure rates could be reduced by knowing the bridge causes linked to processes, people, task, environment and practice and improving the bridge causes (Lehtinen et al., 2014).

Despite various researchers' perspectives and definition of success criteria and success factors, the need for successful information technology project remains undisputed. The use of social theories to solve human problems has also been applied in information systems disciple and by extension to information technology project management. This research relied on social theories to focus on the project process management practices and principles that project practitioners use to achieve a successful ITP.

Social Theory in Research

The application of social theory in understanding social phenomenon has weighed in on many topics. General system theory is one of such theories used in problem-solving philosophically. Luhmann (as cited in Valentinov et al., 2019) stated that modern scholars depict social systems using organizations, functional systems, interactions, and societal system as a whole. Over the decades, the fundamental approach of solving problems in technology and science by breaking the components and processes into smaller events worked so well so long as the causal relation expressed in variables between the observed elements are minimal.

Late in the 1900s, von Bertalanffy opined that that the traditional investigation of individual processes and parts of a living thing cannot provide a comprehensive account of its essential phenomenon since fundamentally, the living thing is characterized as an organization (von Bertalanffy, 1968). This set the foundation for investigating the processes and components of a biology system ("organismic"), as it is necessary to understand how the whole part of the system functions at all levels. The organism view from biology led von Bertalanffy to general systems theory. Lopreato (1970) argue that the concept of "system" has been in use centuries before von Bertalanffty's general system theory, and the idea of atomistic or empiricism approach to solving scientific problems prior to general system theory was inaccurate. None the less, Lopreato (1970) highlighted that there were positive insights that the von Bertalanffy's theory brought into the field of research; one of them being the integration and unification of social and

scientific researchers (e.g., cybernetic, decision-making, set theory, network theory) using the system thinking approach to societal problem solving.

In terms of applicability, von Bertalanffy (1972) postulated that an organism in this sense could be replace by other “organized entities”, which may include organizations, software systems or other electronic devices. Systems theory explains that all systems exhibit similar interconnection, organization characteristics and functional behavior, whether they are biological, planetary of physical systems (Lalande & Baumeister, 2019). Using organizational concept of social systems, Valentinov et al. (2019) analyzed transparency in governance based on von Bertalanffy’s (1968) system theory on open system. Therefore, ITP defined as an organized entity stands a chance to be classified as a system and consequently benefit from social theories in research.

Systems Thinking in Information Technology Project Management

In the 21st century world, thinking in systems has become a norm rather than exception. Walker and Lloyd-Walker (2016) focused on a new thinking on project management which has given way to five new research directions: the complex nature of project, project as a collection of social activities, value creation as key criteria for success, multidisciplinary dimension of project management, and adaptive/intuitive approach to project management. Systems are known to have been in existence and recognized centuries ago, however lacked proper explanation and understanding, until formally developed using systems theories in the early 1900s (von Bertalanffy, 1972). Boulding (1956) gave a very structured perspective to systems by presenting it in a hierarchy of nine levels, namely frameworks, clockworks, control mechanism, cells,

plants, animals, humans, social organizations, and transcendental systems. Notably, the lower level is part of the higher levels and so on. Boulding (1956) suggested this approach as a way of putting together all forms of disciples in one single general systems theory so that one disciple can see through another disciple and grow knowledge.

According to Boulding (1956) the construct of general systems theory "in hierarchy of complexity, roughly corresponding to the complexity of the 'individuals' of the various empirical fields" is more systematic as it presents it as a "system of systems" (p. 202). According to Weaver (2012), a project can be successful if the relationships involved in the social network view of the project are managed effectively, and it is far more important than just delivering on cost, time and quality. Weaver (2012) underscored an opportunity to apply the concept of social network in understanding how successful software projects for instance, could better be achieved.

Just like systems, organizations exist for a purpose and as such exhibit some dynamics. Chris (2016) performed a simulation to understand how the observer of a system sees the system in terms of the inclusivity of the observer as part of the system or not. Sterman (2001) explained the idea of thinking in systems as having the understanding that organizations are such a dynamic complex system, such that one cannot just do one thing without affecting another, because everything is so inter-connected together. Managers of organizations are therefore able to gain better understanding of their purpose by thinking in systems. Keeping this in mind, we can therefore use the system concepts of flow, stock and feedback to understand what goes on in an organization.

Project success criteria are traditionally defined based on quality, cost and schedules. There is a potential danger of micro-managing project processes of the system by not paying attention to the whole system – the project – rather controls implemented to manage processes. This occurs often when managers are under pressure to meet the project iron-triangle key performance indicators; they put pressure on the project task owners who in fact are the elements in the system (Kapsali, 2011). It is important that managers do not fall into this trap; rather managers should always have a continuous holistic view of the system, through a close monitoring of the feedback loops, so as to ensure that the overall purpose of the system is not compromised.

Kapsali (2011) highlighted how system thinking could help projects to be successful in terms of project management practices. The main finding in Kapsali's research is that complex projects with high level of innovation and uncertainty could be better managed with system thinking approach. Kapsali highlighted that system concepts of *causal embeddedness* and *equifinality* are essential control considerations while thinking about complex and innovative project management. Kapsali argued that traditional project management thinking is overly focused on the *iron triangle* of scope, time and cost process management, while ignoring overall goal or purpose of the project, for which success measures criteria may be applied on. Finding from Kapsali's study de-emphasized process control at activities level and shed more light on the need to use system thinking constructs to achieve project success in practice. Limitation of this study was the consideration that systems thinking may not be applicable in all projects and that

the system think approach means boundaries definition, which in many projects were not clearly defined.

Nachbagauer and Schirl-Boeck's (2019) grounded study based on system theory focused on managing risks and uncertainties in very large projects using the systems theory in combination with the second-order cybernetics. Van Marrewijk et al. (as cited in Nachbagauer & Schirl-Boeck, 2019) elaborated factors that lead to complexity in mega projects as high numbers of interconnectedness of project elements, involvement of many technological disciplines, large participation of individuals, diverse nationalities, high-level stakeholder interest, country risk, and political risks. These attributes are also consistent with ITPs which are often complex in nature. System theory could easily be applied to project management, especially by exploring their applicability in decision making process and resilience (Nachbagauer & Schirl-Boeck, 2019). Sheffield et al. (2012) argued that practitioners have not sufficiently explored the practical application of system thinking in project management, given the diverse views and relationships in complex projects. Sheffield et al. (2012) philosophy in their paper was that complexity in project management could be better controlled using system thinking approach. For example, Johnstone et al.'s (2006) explored governance and conflicts resolution phenomena in ITP using systems thinking concepts such as input, output and control mechanisms. The use of system thinking in developing a project management framework in Johnstone et al. (2006) study has its limitation of not extending beyond governance and conflicts resolution.

The idea that *the whole is larger than the sum of the parts* behind the system theories has relevance in ITP management. In this research an opportunity was explored to extend the use of system thinking - to have a holistic view of ITP management in areas of process management as a whole, and not in parts. In particular, ITP was seen through the lenses of an open system.

Open System and Information Technology Project Management

A system could be closed or open. Ludwig von Bertalanffy conceived the idea of *open system* using biological concepts many decades ago (von Bertalanffy & Sutherland, 1974). An open system is defined as a system that "maintains itself in a continuous inflow and outflow, a building up and breaking down of components, never being, so long as it is alive, in a state of chemical and thermodynamic equilibrium but maintained in a so-called steady state which is distinct from the latter." von Bertalanffy (1968, p. 39). At the Ludwig von Bertalanffy Memorial Lecture, Caws (2015) cautioned about the definition of open versus closed system with regards to boundaries. Caws (2015) stated that an open system could be closed as well depending on the selective acceptance of how the elements of the system relates with other elements adjacent to it.

Bertalanffy's open systems theory metaphorically presents a model that consists of components that have a transparent flow of information, maintained at equilibrium, and sustained at a steady state even when the future systems state is different from the earlier state. System thinking has been used previously in project management research (Weaver, 2012). In the context of ITP management, the system components transparency in the exchange of information is akin to the processes interactions and equilibrium

sustenance likened to stability and adaptability, which leads to success of the project - a new state different from the earlier state.

There is a potential application of the concept of transparency in open systems environment, or the potential lack of it, which is lack of accountability in ITP management. Valentinov et al., (2019) opined that some organizations could enhance accountability to gain efficiency and good governance or management. The idea of transparency and the reasons behind this potential could be adopted in an ITP organization. For instance, the survival of such an open system as described by von Bertalanffy is dependent on the dynamic and transparent exchanges that occur within the system's environment. The position of von Bertalanffy is that sociologically, isomorphisms could facilitate the development of models that yield better understanding of many parts of a societal problem due to the high-level perspective on varying properties or elements of the system (von Bertalanffy & Sutherland, 1974).

Open system exhibit equifinality property of being bounded in its environment while its components are interdependent, freely exchanging energy following a certain form of structure and organization. Open system's equifinality behaviors ultimately result in a steady independent state whose initial conditions change as determined by the parameters in the system (Lopreato, 1970). The key and most important realization is that a system is a whole rather than a sum of elements or components; hence general systems theory could be described as a way of observing all things or everything using the same lens (Caws, 2015). According to Caws (2015), within a system there exist functional relationships with independent elements that constitute it. Systems thinking views is that

the world is totally interrelated, and all the parts are interacting intelligently and predictable in principle (Caws, 2015). The notion being that there may be multiple boundaries, but the whole is still with a purpose or goal.

Given the complexity of the society and advancements in technology, general system theory could help bridge knowledge gaps in providing practical solution to the problem of the world (Caws, 2015). This is practicable in project management, where boundaries of an ITP are defined in terms of scope, resources, stakeholders and other parameters. Chmielarz and Zborowski (2018) opined that ITP management should move towards adaptive, flexible, and agile methodologies, with less of formalization – hence giving a holistic approach to project management.

The focus of this research was to view project processes in an ITP as an open system and to understand how project practitioners managed the constituents or elements in the open system, towards achieving success.

Information Technology Project as an Organization

A project is a temporary organization encompassing interacting (related) processes, using methodologies and tools aimed at delivering a product or service within a given time and cost, and according to a specific quality and performance expectation (PMI, 2017). In the study of organizations, Morgan (1997) used the metaphor of 'organization as a brain', to paint an image of organization from *system* perspective. According to Morgan (1997), organizations could be described as a decision making, information and a communication system – like a brain. Floricel et al. (2014) styled project as a temporary social organization, and its challenges analogous to social

problem, hence, could be addressed using social theories and models. Floricel et al. gave instance of the use of social theory in extant literature to evaluate change management practices, enhance the design of information systems, and identify cause of ITP implementation failure.

Thinking of a project as an organization, and consequently as a system could be beneficial. System thinking enhances decision making in the long run since such decision would be all encompassing for the uttermost interest of the system as whole entity (Sterman, 2001). In all these, every concept about organization tends to point at a complex unit, being broken down into smaller units, and communicating or relating with other units and completely being coordinated through a structured unit, which I could refer to its 'leadership' or 'management'. These units being, systems by themselves, when pulled together with their coordination process form an organization. Lawrence and Lorsch (1967) in their study of a firm's internal structure highlighted that two major components define a firm's organization, namely "segmentation of the organizational system into subsystems" which they called differentiation, and "achieving unity of effort among the various subsystems in the accomplishments of the organization's task" which they referred to integration (p. 3-4).

The coordination activity was represented by Boulding (1956) in the form of existence of humans at levels seven as 'human system', and at level eight as a component of 'social organization system'. In both cases, one thing very significant is that human beings have "self-reflective qualities", and also constitutes "set of roles tied together with channels of communications" which represents an open system that is complex and

adaptive in nature (Boulding, 1956, p. 205). The understanding of such systems will help explain why project practitioners behave the way they do, while self-reflecting or responding to the communication they receive from their environments.

Floricel et al. (2014) stated that "understanding of project organizations can benefit from studying knowledge in the form of organizational and societal practices" (p. 1100). In positioning systems definition from relations perspective, Caws (2015) argued that an observer of a system could become a part of the system by intention, and by extension spun a new system due to the new boundary. Organizations are inherently systems made up of subsystems that must be understood and managed efficiently.

The organizational thinking approach suggests that scientific problems could better be solved through a holistic isomorphic perspective of multiple phenomena, rather that distinct empiricism approach. In reality, project process management practices occur in organizations and the essence of this research was to understand what principles guided the IT practitioners to achieving success.

Interconnectivity in Information Technology Project Management

The use of social network has been adopted in behavioural science field due to its focus on interactions between actors in a network model (Dang-Pham et al., 2017; Hassan, (2009). Using the concepts of project as a temporary organization and the social network, Weaver (2012) carried out a breakdown of project activities from complexity form into a simple social network form. Weaver (2012) identified stakeholders or individuals as 'actors' in the network; the interaction of one actor with another as 'a relationship'; a combination of many actors as a 'social network' which can hold 'social

capital'. In systems thinking approach in projects, Sheffield et al. (2012) recognizes that the project practitioners are part of the system and interacts with other parts within the boundaries as well as the external environment such as stakeholders, regulations and culture. A system receives input and also transmits output. In project management, project processes are purposefully designed to act as sub-systems within the larger system, receiving inputs such as requirements and transmitting outputs such as activity schedule. Cristóbal (2017) expressed the importance of understanding complexity in project management processes, emphasizing the use of a system thinking-based complexity model. Cristóbal (2017) indicated that a complexity model relevant for and effective project management should consider process elements, their interdependencies and additionally include good project management skills. Hence, project management processes encompasses elements and independencies while project manager's skills are captured in the practices they apply towards project's successful completion. Joseph and Marnewick (2020) argued that information systems projects are understated in the context of complexity of projects. IS project complexity (ISPC) model highlighted ten elements, which include resource management, organizational resource interdependencies, uncertainty, size, change management, stakeholder management, technology novelty, locations, organizational architecture, and goal orientation (Joseph & Marnewick, 2020). These complexity elements indicate the relevance of a holistic view in IS or ITP management processes to ensure adequate control.

The fact that systems have elements that are interconnected paves way for the overall behavior of the system to be influenced by the movements or dynamics of the

elements and its interconnections. A system is defined as a collection of elements interrelated and interacting among themselves as well as with their environment (von Bertalanffy, 1972). In mechanics and following dynamics theory, a system responds to uneasiness or disturbances from within and outside the environment in an attempt to stabilize to equilibrium. A system is considered stable if it is resilient to minor perturbations. Meadows (2008) described system dynamics modelling as a process of investigating what the system's outcome will become if some elements of the system were altered. According to Morgan (1997), a system exhibits a self-regulation behavior due to its ability to receive negative feedback information exchanges, and process them. A system could be within systems in a nested formation; hence a general overarching purpose could encompass multiple purposes (Meadows, 2008). Weaver (2012) proposed a perspective of project management through a 'complexity' theory concept. The idea, according to the Weaver (2012), is driven by two project management phenomenon, (a) projects management could be viewed a temporary organization, (b) project activities involves social exchange of knowledge (social capital). Weaver's (2012) paper was drawn from the assumptions that (a) complicated systems can be studies by reduce them to simple form, (b) outcomes from project activities are repeatable and predictable, (c) outcome of projects are controllable and can be improved with better controls, and (d) projects risks can be eliminated altogether. Similarly, Floricel et al. (2014) on actor-network theory (ANT), indicated that "activity theory emphasizes the structuring role of a social abstraction, the object of activity; structuration theory stresses pre-reflective

cognition, which emerges at the juncture of individual frames and social interactions; while ANT emphasizes the constitutive role of actors and material substrates" (p.1101).

The reduction of complex system to a simple form could typically include the abstraction of the organization such as a project into network (Fichter et al., 2010). Networks can be found in many forms and various parts of the society people live in, including various physical structures, and so the study of network theory creates opportunity for better understanding of systems behaviors. A network consists of entities - represented as nodes - such as individuals, business, project artifacts, processes, software, connected by links representing the relationship between the entities (Borgatti et al., 2013). Since networks are essentially components of a system, the nodes or agents in a network interact or relate with each other through their links (relationship) in the form of flow of information, energy or material within the system (Meadows, 2008). Floricel et al. study also focused on social theories to address practical project management issues with an opportunity to explore other social theories to evaluate their adoptability in the field of project management. Floricel et al. (2014) also highlighted the increasing and recent application of actor-network theory (ANT) in ITP management, emanating from the concept that projects are temporary and unstable set of human and non-human actors in a system pursuing various goals.

Information technology project processes belong to a network and are intently designed with a purpose, each process having input and output and surrounded by other processes. These processes also fit together to support the overall aim and purpose of the project, which is success. In this research, the interconnectedness of processes and

elements in project management was evaluated from project practitioners' perspectives to understand what practices effectively led to ITP success.

Project Stability, Survival and Adaptability

The purpose of project management is to ensure success. The integration of systems theory in project management practices, especially picking on concepts like *cause, effects,* and *interconnectedness,* could help unravel complexities in project management practices (Sheffield et al., 2012). Projects like systems are bounded by scope and purpose, and these boundaries could change as the scope or purpose changes; hence there is the need for stability, survival, and adaptability throughout a project's life cycle. Moving away from the traditional *iron triangle,* Swartz (2008) opined that the performance of project's resources and activities considering disruptions under uncertainties and how consistent resilience plays a role in project success. Social science and complex systems concepts have been used in project management research (Plokhov et al., 2016; Uddin, 2017). A project is a collection of social activities and it complex in nature (Walker & Lloyd-Walker, 2016), hence the use of social theories such as complex adaptive system (CAS), could enhance project management research and unravel ITP management challenges (Floricel et al., 2014; Plokhov et al., 2016).

Perrier et al. (2018) in their study assessed the control processes of project management between PRINCE2 and PMBOK standards using network analysis. They found out that corrective actions through feedback mechanism are central to project control. This qualitative study explored how the project practitioners ensured that the control processes are integrated to achieve success.

Kautz et al. (2020) described complex adaptive system as a continuously interacting set of novel agents where, (a) global competition does not exist neither is a climax state achieved by agents, (b) diverse and collaborating agents with varying functions occupy the system, (c) equilibrium is hardly achieved, even if achieved, it is very temporary as agents continue to innovate, and (d) the order of the day is adaptation, which drives changes in the direction of the system. The Ross Ashby's general theory of adaptive systems elucidated that a system's survival and stability necessitates the use of feedback mechanisms, which could be likened to a project team's motivation principles, with a project viewed as a system (Abyad, 2018; Umpleby, 2009).

In the context of project management, the system components transparency in the exchange of information is akin to the processes interactions and equilibrium sustenance likened to stability and adaptability, which leads to success of the project - a new state different from the earlier state. Walker and Lloyd-Walker (2016) believed that project management should be about social dynamics, human interactions, fluidity and stability during project framing and practices, stakeholder relationship, power play and politics. Walker and Lloyd-Walker's (2016) interpretation was based only on a review of article from a single journal covering 2008 and 2015. Project management practices vary among project managers who have the responsibility to identify and prioritize processes that potentially influence project stability throughout its lifecycle towards success (Abyad, 2018; Herrera et al., 2020).

Nachbagauer and Schirl-Boeck (2019) argue that the classical approach to project management may not always lead to the desired result since complexities related to mega

projects cannot be fully planned for or controlled. However, project practitioners can prepare their minds by the incorporation of self-organization principles in project management practices, in such areas as decision making for resilience and stability (Nachbagauer & Schirl-Boeck, 2019). Characteristics of complex systems included unstable system boundaries, unpredictability of the system behavior and the unsteady relationship between input and output of the system (Stacey, 2007). The interactions that occur in a system are relevant to the system at the time they happen and cannot be evaluated separately from the system (Stacey, 2007). The behavior of complex adaptive systems is unique in that it is self-organizing, often leading to the creation of something new, which in turn feeds back into the system to create some other thing new (Large et al., 2015). The process of interaction of the elements of the system depends on feedback loop mechanisms. According to Mosekilde (as cited in Large et al., 2015) the system's positive feedback loop targets to bring the system into a stable level of equilibrium; however, it could still go beyond the target, but how much far away it goes defines the sensitivity of the system. While attempting equilibrium, the system could go from stable to act unpredictably in relation to the amount of variations in the system control parameters, a behavior known as butterfly effects' as observed by Lorenz (as cited in Large et al., 2015). Systems that are self-organizing do not breakdown, rather they form other systems. A responsive process in a complex system demands spontaneous reflection on the systems interactions at the time it occurs (Large et al., 2015). A complex system is made up of agents and networks that exhibit unpredictable behaviors, far from

equilibrium, dynamically exchanging resources through processes and rules that yield positive and negative feedbacks (Fichter et al., 2010).

On the basis of the believe that effective project management is related to project success, Rajagopalan and Srivastava (2018) developed a Project Health Index (PHI) that could predict the likelihood of ITP succeeding. PHI is a variable, which depends on input from 17 metrics that are project management oriented. Although mainly used to predict success probability, PHI could also assist practitioners to improve project sustainability and adaptability through a timely prioritization and allocation of resources as required during project execution.

In the life of every organization, there will always come a time when changes must take place. In some cases, these changes could lead to some form disruptions, prompted by either external or internal factors. The situation calls for some level of resilience for survival from management, especially when the risk is beyond the control of the organization. The World Economic Forum (as cited in Garel, 2013) report suggested three characteristics of resilience that are necessary for organizations to survive, namely, robustness, resourcefulness and redundancy; and two resilience performance attributes namely response and recovery. This circumstance is applicable in information technology projects as well.

The responsibility of the project manager is to guide the project to success by ensuring stability, survival and adaptability – critical components of resilience. This research focused on the project managers' practices that guided ITPs to success from a process management perspective.

Project Management Processes

Project practitioners have increasingly relied on internationally recognized project management guides, such as Project Management Body of Knowledge (PMBOK®) Guide defined by PMI (Hidding & Nicholas, 2017). PMBOK is both a repository of knowledge and practical steps to guide project managers in developing a project framework and defining proper processes towards successful project delivery, comprising of tools, techniques, and processes for project management.

There are over 700 thousand PMI members in over 100 countries globally relying on the PMI's Guide, which provides the knowledge required for successful management of projects (Herrera et al., 2020). PMBOK is different from ISO 21500: 2012 in that ISO 21500: 2012 does not provide any description concerning techniques and tools (Varajão et al., 2017). PMI leadership did not identify any specific knowledge area as most important, but advised project managers to decide on each project what knowledge areas to develop further than others. Hidding and Nicholas (2017) recommended that project managers should embrace PMBOK traditional practices, especially those associated with project success, such as scope management, communications management, stakeholders management, executive sponsorship, schedule, budget and cost management to improve ITP performance. Garel (2013) reviewed the history of project management from the time before models were developed around project management, to the time it was standardized. Garel traced the evolution of project management from the 20th century works of Garel indicated that there is a wide acceptance of the PMBOK by many professional. Garel also stated that there is a growing criticism of PMI for being

"rational". However, Perrier et al. (2018) compared control processes of project management between PRINCE2 and PMBOK standards and found similarity in the standards, with more controls included in the PMBOK standard.

PMI leadership identified 49 project processes across ten knowledge areas described in the following section (PMI, 2017).

Project Integration Management

Integration management involves ensuring that the entire project is held together in one logical piece. Jaber et al., (2016) highlighted the importance of visualizing project tasks and resources information in a way that helps in project integration management. The processes in this knowledge area include Develop Project Charter, Develop Project Management Plan, Direct and Manage Project Work, Manage Project Knowledge, Monitor and Control Project Work, Perform Integrated Change Control, and Close Project or Phase. Monitoring and control of project is important to project practitioners as it helps in the proactive identification of potential issues and acting on them on a timely manner towards success.

Project Scope Management

Since every project is bound by specific deliverables, scope management ensures that the project scope is well defined and controlled. The processes involved include Plan Scope Management, Collect Requirements, Define Scope, Create WBS, Validate Scope, and Control Scope. Adam and Danaparamita's (2016) study show that there is a strong correlation between unrealistic expectation due to poorly managed scope and ITP failure. Scope management processes are essential in project management success as it provides

practitioners the structure to plan and deliver the requirements within time and budget (Yana, 2018).

Project Schedule Management

Delivering of project within time is ensured through the schedule management. The processes include Plan Schedule Management, Define Activities, Sequence Activities, Estimate Activities Duration, Develop Schedule, and Control Schedule. In ITP schedule management processes, obtaining accurate duration - using advanced techniques such as Monte Carlos simulation - is essential to achieving successful project delivery (Zhang & Jin, 2020).

Project Cost Management

Projects could suffer cost overrun if not effectively managed financially. Hence, the processes of Plan Cost Management, Estimate Cost, Determine Budget, and Control Cost are defined to guide the project practitioner. Decision making regarding project cost and cost management concepts are practical principles, which allow organizations to realize successful projects (Dušan & Jugoslav, 2019). For a given scope, IS/ITP are bound to complete within a specific cost and limited time to be accessed as being successful (Sanchez & Terlizzi, 2017).

Project Quality Management

To ensure that the project meets the desired purpose, the outcome is defined with quality attributes. The processes of Plan Quality Management, Manage Quality, and Control Quality are defined to ensure that the specifications described by the product or service owner are met, given the time and cost constraints.

Project Resource Management

The teams that will be participating in the project will devote their resources and skills towards the execution, hence will be managed. The processes involved in managing the resources include Plan Resource Management, Estimate Activity Resources, Acquire Resources, Develop Team, Manage Team, and Control Resources. Effective communications and management of human resources in project teams is difficult – especially for global team due to cultural differences - yet essential for project success (Browne et al., 2016). Project practitioners address the challenges using resources management process and communications process.

Project Communications Management

Communications with teams and other stakeholders is essential in keeping the project on track. To achieve an effective communication, the processes of Plan Communications Management, Manage Communications, and Monitor Communications are established and defined in PMBOK. Alsulaimi and Abdullah (2020) in their study stressed the need to have an effective communication among ITP teams and stakeholders in organizations, paying particular attention to their differences to achieve the communication objectives.

Project Risk Management

Unexpected eventualities are bound to occur during a project life cycle. The processes defined in PMBOK to manage this include Plan Risk Management, Identify Risks, Perform Qualitative Risk Analysis, Perform Quantitative Risk Analysis, Plan Risk Response, Implement Risk Response, and Monitor Risks. Identifying risks and

effectively cataloging them is critical to software development and ITPs success (Machado et al., 2019), and for complex projects, a qualitative risk assessment of risks is even more critical (Burkov et al., 2018).

Project Procurement Management

As some projects could involve outsourcing or external procurement, the processes of Plan Procurement Management, Conduct Procurements, and Control Procurements are designed to support the tasks if needed. de Araújo et al.'s (2017) systematic review of literature show that project procurement management is essential for project success, especially from the angle of understanding the relationship between clients and supplies as well as the nature of partnership that exist between them.

Project Stakeholder Management

Stakeholders are important in every project, and should be engaged adequately. Therefore, in PMBOK, the process of Identify Stakeholders, Plan Stakeholder Engagement, Manage Stakeholder Engagement, and Monitor Stakeholder Engagement is defined. Stakeholder understanding and engagement has been highlighted in several literatures as an important project management process. Nguyen et al. (2018) focused on complex projects to reveal the relevance of performing social network analysis to expose the inter-relationships among multiple stakeholders, including diverse topics such as regulations, policy changes, and strategies.

Processes Management in Information Technology Project

The International Standard Organization defined a process as a "set of interrelated or interacting activities, which transforms inputs into outputs" (Corrie, 2004, p. 3).

Hence, identifying processes grouped into knowledge areas in PMBOK could explain the relationship between project success and processes. Project knowledge areas have relative importance to project success (Javed et al., 2015).

Abyad (2018) reviewed project management from process management philosophy, describing how motivation theories could be applied in project management through project process management practices. Similar to business processes, project processes are interrelated and interact when the output from one process is used as an input into another process during the project life cycle, thereby potentially influencing project success (Bruno, 2015; PMI, 2017). Javed et al. (2015) study involving the use of PMBOK knowledge areas to assess project management perception revealed that some processes were more important for project success, calling for further research.

The project manager's role requires identifying what motivates the project team and defining a strategy to sustain the motivation towards success – which may include defining the right practice and strategy for process management. In some cases the project manager may decide to focus on some processes and prioritize its management to ensure success. Herrera et al. (2020) argued that processes were defined in PMBOK in a manner that suggests isolation. Herrera et al.'s research was based on the philosophy that processes could be viewed from a system perspective. There could exist an impactful level of interaction among processes during project management following PMI's PMBOK Guide. The 49 processes that PMI proposed are complex and not related linearly, making it difficult to describe or manage diagrammatically; hence Herrera et al. (2020) evaluated how processes interact using the social network analysis (SNA) method.

Herrera et al. (2020) found that the project processes are well integrated; therefore, any deficiency in integration could mean insufficient use of each process's elements or artifacts in practice. The practice of process management in projects could vary among project managers, and in turn, influence how the process and their relationships are prioritized. Herrera et al. (2020) elucidated that the mechanism supporting the interaction of processes must be identified in practice. For example, an alert mechanism, which serves as feedback to the project managers for action, could be positioned appropriately to correct and strengthen process interactions in practice.

Although projects are not repeatable, Abyad (2018), Chmielarz, and Zborowski (2018) viewed them as repeatable processes, indicating that process management practices could be applied to project management. Abyad (2018) elucidated that the purpose of a project is to achieve success. Joe et al. (2016) developed a project characteristics-based model that related process improvement with project success factors. Varajão et al. (2017) research provided leverage for further research of project management practices from a process perspective further. In particular, Varajão et al. found that quality management and risk management processes were neglected in practice, suggesting a specific review of these areas. However, to ensure the inclusion of all potential factors, including the neglected processes, a grounded study could uncover the principles practitioners use in practice for successful ITPs.

Berisha-Shaqiri et al. emphasized the important and repetitive nature of the planning process in ITPs. Project management is often perceived as a process and an activity, consisting of organizing, planning, and mobilizing resources to meet a defined

goal using controls and procedures (Joe et al., 2016). Planning for a project consists of identifying which project management process will be used and the control practices that should be in place during execution to ensure success (Berisha-Shaqiri et al., 2018). The project manager spend time to plan before starting any project, as the planning processes make up about 50% of the processes in PMBOK (PMI, 2017).

Joe et al. (2016) used the business process mining method on ITPs and found that business performance could be enhanced through project process improvements. Joe et al. believed that projects are performed by many organizations following the same procedure, justifying the research approach of process mining to unveil and improve the processes. Evident in Joe et al.'s study is that the understanding of sequence of tasks in process and other parameters could play a positive role in ITPs efficiencies improvements, especially in software development life cycle. Joe et al.'s built a business process model that allows for conversion of project management logs into project process flow. Joe et al. presented an opportunity to study further the role of process management practices in ITP success.

While Varajão et al. (2017) researched the extent of application of the process management of ITPs covering ISO and PMBOK methodologies; there remains a system thinking approach to consider how processes interactions are guided in practice towards success. An opportunity to further explore the project management practices related to processes management in information technology projects was explored in this research to understand what principles guided practitioners in the successful management of projects.

Summary and Conclusions

This literature review revealed extant studies regarding the role of project management best practices play in achieving a successful information technology project. This study developed a substantive theory that helps to understand process management practices in successful ITPs. The topics discussed extended to underpin the relevance of system thinking and process management in project management practices. The review covered ITP management practices, successful information technology projects, social theory in research, system thinking in information technology projects, and open system. Other topics include information technology as an organization and interconnectivity in information technology project management. Topics related to the conceptual framework, such as project stability, survival and adaptability, and process management in an ITP, were also discussed. The concept of system thinking has been applied in project management practices, including theoretical research studies. Specific attention was paid to information technology project success through survival, stability, and adaptability in this review. From the perspective of the conceptual framework of this grounded qualitative study, von Bertalanffy's (1972) works on general systems theory and Ross Ashby's (1956) on the general theory of adaptive systems were also discussed in detail. The gaps identified in the literature, which is related to project management practices relevant to information technology project success from the perspective of process management, were discussed in the literature. The research methodology is addressed in Chapter 3.

Chapter 3: Research Method

The purpose of this qualitative grounded theory study was to explore project process management practices of practitioners in successful ITPs and develop a theory describing how to best use project management processes in practice to achieve success. A project is a collection of complex social activities; hence, social theories could enhance project management research and unravel ITP management challenges (Floricel et al., 2014; Plokhov Dmitry et al., 2016). The findings from this research contribute to solving practice-based, theory-based or knowledge-based social problems in society.

In the subsequent sections of this chapter, the rationale of the research design is discussed. My role as the researcher and the research methodology is also discussed. Finally, how trustworthiness of the research was established is discussed, covering credibility, transferability, dependability, and conformability. Finally, ethical considerations are discussed.

Research Design and Rationale

The study was conducted with a grounded theory research methodology. The phenomenon, which is the 'process management practices in a successful information technology project,' was evaluated through an in-depth exploration of the real-life experience and perceptions of ITP practitioners. Grounded theory research methodology has previously been used in information systems and information technology research to construct theories, develop models, and provide descriptions to solve social problems (Given & Willson, 2018; Wiesche et al., 2017). The aim of this research was to construct an emergent theory, which could contribute to the understanding of project management

practices from a process perspective and help project practitioners achieve successful ITPs. A theory can be described as a combination of constructs and abstract variables modeled within a boundary and guided by justifiable relationships (Wiesche et al., 2017).

The main research question that guided this qualitative grounded theory study was "What practices in process management do information technology project practitioners rely upon as guiding principles in a successful information technology project?"

Other research questions that helped in exploring the phenomenon mentioned above are:

RQ1. How do project practitioners describe process management elements and process purpose in successful information technology projects?

RQ2. How do project practitioners describe process management feedback mechanisms, including the interactions among project processes, in successful information technology projects?

RQ3. What do project practitioners perceive as the best way to apply process management principles towards ensuring project survival, stability, and adaptability in information technology projects?

The aim of the grounded theory approach is to understand social processes through in-depth exploration of the interactions that generate the process variants and outcomes (Heath & Cowley, 2004). Grounded theory was identified suitable for this research because it enabled me to inductively and iteratively discover substantive theory in the phenomenon using identified central concepts (Charmaz, 2017). The construction of substantive theory using rich data from IT practitioners' experiences was valuable

since the approach is pragmatic and interactive in nature (Burkholder et al., 2016; Wiesche et al., 2017). The emergent theory from this research was guided by a conceptual framework supporting the boundaries and possible variables. Theories go beyond models to offer descriptions based on the researchers understanding of the data and explain how the central concepts in the conceptual framework of the study are related within the boundaries of the model (Wiesche et al., 2017).

Central Concepts

This study's concept was based on von Bertalanffy's (1972) general systems theory and Ross Ashby's (1956) general theory of adaptive systems. Concepts are basic ingredients in constructivist grounded study leading to a substantive theory (Dunne & Üstűndağ, 2020). The concepts derived from von Bertalanffy's general systems theory and Ross Ashby's general theory of adaptive systems consist of the *social complex system*, *elements*, *purpose*, *interaction, feedback mechanism*, *survival*, *stability*, and *adaptability*. Regarding the concepts, ITPs were viewed as a complex system in this study.

Social science and complex systems concepts have been used in project management research (Plokhov et al., 2016; Uddin, 2017). ITP was conceptualized as a social complex system of interconnected purpose-oriented processes. Project practitioners guide projects through feedback mechanisms to success using the process management elements and interactions for its survival, adaptability, and stability throughout the project life cycle (Arnold & Wade, 2015, p. 3; Fichter et al., 2010; PMI, 2017; Varajão, 2016; Wilson, 2015). The principles that project practitioners potentially rely upon as a

guide in process management towards achieving a successful ITP was the subject of grounded theory evaluation in this qualitative research (Dunne & Üstűndağ, 2020).

Qualitative Research Tradition

Researchers have traditionally relied mostly on qualitative research design when considering theory construction (Glaser & Strauss, 2017). The qualitative research design aims to access the rich data consisting of human experiences, interactions, and events obtained directly from diverse perspectives within the social system being studied. This approach helps to understand complex situations or issues or complex events. With no intents of generalization, the qualitative research approach provides a sort of diagnosis by exploring a phenomenon in a small population. Researchers use a qualitative approach to empirically search for meaning through a systematic investigation of accounts of participants in their natural environment focused on a phenomenon (Glaser & Strauss, 2017).

In qualitative research, techniques often include an interview, observation, and listening to accounts of participants in their natural setting through various sources while synthesizing them (Glaser & Strauss, 2017). The approach provides higher in-depth visibility into why a phenomenon occurs, addressing questions of how and why. The participants in a qualitative study could be a group of people, a specific event, or an action.

One of the qualitative approach features is subjectivity and inductivity, involving interpretivism and constructionism (Merriam & Grenier, 2018). Research questions are used instead of hypothesis in qualitative research due to its inductive nature. Other

qualities that the qualitative approach exhibit are (a) it is both product and process-focused, (b) it is bounded by context, (c) it interprets data and allows for validation of observations, and (d) it allows for the participant to flexibly collaborate while exploring an in-depth understanding of a phenomenon (Prasad, 2017). Being exploratory allows for data that emerges to be used in theory construction. One of the key benefits of using qualitative research is that the researcher is part of the social phenomenon under study, enabling detailed and in-depth investigation from the inside.

There are diverse qualitative research traditions, such as grounded study, ethnography, case study, and phenomenology (Burkholder et al., 2016). Unlike other qualitative research designs, in grounded theory study the researcher develops an emergent theory from data as against extant literature (Urquhart & Fernández, 2016). During grounded theory study, the researcher assumes that reality, even if not perfect, is perceived by the participants and observed in the data (Urquhart & Fernández, 2016). Hence, grounded theory benefits mainly from concurrently collecting, analyzing, and synthesizing data until theoretical saturation is reached (Charmaz, 2017), leading to an emergent theory (Flick, 2018). The grounded theory approach was used in this study because it most appropriately addressed the need for an emergent theory construction based on data representing best practices from ITP managers lived experiences. Delphi design also involves close engagement between the researcher and the experts who are the participants; however, the aim would not be to construct a theory, but to arrive on a consensus regarding a difficult question in the field (Hsu & Sandford, 2007). Hence, the Delphi design was not adequate for this study.

In ethnography, the researcher explores the political, historical, or socio-culture behavior of groups or individuals in a setting (Harwati, 2019). Although project management may have some power, political, and cultural elements (Walker & Lloyd-Walker, 2016), this current research did not seek to understand socio-cultural elements, rather focused on process management principles of a project manager; therefore, ethnography was not appropriate for this study. Similarly, in a case study, the researcher studies a group or individuals associated with a case over a long period (Harwati, 2019). According to Yin (2017), a qualitative case study is employed when a case is not apparent, and it demands the appraisal of the independent opinion or account of the participants. It is used to unearth individuals' in-depth information on the phenomenon under investigation. There are various case studies, such as a single case, multiple cases, and descriptive case studies. However, the fundamental characteristics of a case study was not met for this study since the purpose of this study did not seek to validate an opinion about a case, rather construct an emergent theory regarding a phenomenon. The phenomenological research design is also a potential design option. However, similar to the case study, phenomenology involves exploring lived human experiences (Silverman, 2016). However, with phenomenology, a researcher collects in-depth emotional and affective data regarding an identified phenomenon based on the accounts provided by those who have lived through the experiences (Merriam & Grenier, 2018). The phenomenological research design was not suitable for this study since the participants' experience of interest did not have an affective or emotional connotation.

Apart from qualitative research, other approaches are quantitative and mixed-method research studies. While the qualitative approach is a form of investigation that deals with evaluating a phenomenon in their real natural setting for in-depth understanding, the quantitative approach involves the gathering of measurable data in numerical form and analysis using mathematical tools to quantitatively explain the occurrence of things (Sahin & Öztürk, 2019). This study relied on in-depth human experiences, which is subjective; hence quantitative research design would have been less effective. The third approach, the mixed-method research tradition, is the synthesis of the qualitative and quantitative approaches. The goal of mixed method research is to integrate the human element, which is missing in quantitative research by complementing it with a qualitative approach. Mixed method research, being a quantitative and quantitative composite, implied that both deductive and inductive elements are required in the approach (Sahin & Öztürk, 2019). As this study was inductive to meet its purpose, the mixed method was not suitable. Although the emergent theory could have been subjected to quantitative empirical testing in a deductive manner that supports mixed-method tradition, the research questions that guided this inquiry did not support the deductive investigation. Hence the mixed method design was not effective for this study.

Role of the Researcher

The qualitative researcher's role is to reflect upon the research question and the phenomenon in making the decision about the data sources, collection method, and data analysis, therefore ensuring that the purpose of the research could be achieved (Prasad, 2017). Being a qualitative study, I was the instrument for the data collection using open-

ended interview questions, playing both a participant and an observer role to obtain in-depth information on the phenomenon. The participants were contacted through social network platforms, specifically the LinkedIn network (LinkedIn.com) to request their permission to participate in this study. Although I am a certified project management professional (PMP) and a PMI member, I ensured that I recruited only participants who are not in the same organization as I am. To guide against bias, I performed member checking activity, ensuring that each participant received and validated a copy of the interview transcript via email (Flick, 2018). Since the researcher is the primary instrument of data collection in qualitative research, the data collection process, which involved observations, review of field-notes, and interview transcripts, required the researcher's vigorous participation. There was insignificant bias exposure in this study, so I ensured that I remained neutral in my role as the researcher using bracketing technique during the data collection and analysis.

Methodology

In this section, the detailed methodology for the qualitative grounded study is described. The section details other topics such as participants' selection logic, instrumentation, and recruitment, participation, and data collection procedures. The section was concluded with the data analysis plan.

Participant Selection Logic

The research participants were purposively selected from a population of project practitioners, specifically with the role of ITP manager. ITP practitioners who were present on the LinkedIn network, including member of the PMI organization were in the

population and were also included in the selection. Project management practices are promoted in PMI organizations, present in many countries with a global membership of over 700 thousand professionals (Herrera et al., 2020), including ITP practitioners. Additionally, I relied on the referral technique (snowball) to contact ITP managers in the same industry as I am, but who work outside my organization. Snowballing technique is useful where it is difficult to access participants who qualify for research based on the phenomenon in a timely and cost-effective manner (Gill, 2020).

Research data was collected through a purposive sample selection of ITP practitioners who have successfully managed one or more projects. ITP is perceived successful upon satisfactory realization of the defined benefits by delivering the required IT services or products within budget, scope, and time (Varajão, 2016; Velayudhan & Thomas, 2016). As part of project management practice, ITPs success requires an appropriate measurement of perception from multiple stakeholders, including project managers' (Davis, 2018). Participants were required to provide their basic assessment in terms of the success or failure of ITPs that have managed to guide sample selection.

Purposive sampling also known as judgmental sampling is appropriate for qualitative research as it involves intentionally selecting participants with a significant level of understanding and knowledge about the phenomenon under study (Gill, 2020). In this study, participants were contacted through the LinkedIn social network platform, referred ITP manager practitioners. Selected participants did not receive any monetary incentive. The sample size was not predetermined; rather, the conclusion on the sample selection was reached at the point of theoretical saturation during data collection and

analysis (Tie et al., 2019). Iteratively selecting purposive samples in a grounded theory study offers an advantage because the researcher's attention is not on generalization but reaching a point whereby data collected from interviews add no significant new information (Charmaz, 2017). Data collection continued through interviews until the point of theoretical saturation was reached to ensure that the resulting emergent theory is well-developed (Gill, 2020).

Instrumentation

The preferred method of data collection in qualitative grounded theory research is through interviews, conducted by the researcher as the instrument (Charmaz, 2017; Tie et al., 2019). I conducted this study, and as the instrument, I personally administered the research question using interviews (Appendix A). The interview sessions were recorded and responses from each of the participant were transcribed. Interviews enable a high-level of engagement and interaction between the participant and the researcher. Given the circumstances regarding the global travel ban due to the Covid-19 pandemic and the movement restrictions to reduce personal contacts, face-to-face interviews was not appropriate for this study at the time they were conducted. Therefore, the use of telephone and video calls was adopted during the interviews. Each interview was audiotaped, or video recorded depending on the access technology accessible during the interview. The recorded interview was transcribed and organized using NVivo® Software for subsequent data analysis (Woods et al., 2016). Memos were maintained to reflect on what the participants said and my understanding at that point in time (Charmaz, 2006).

To ensure that participants' privacy was respected, pseudonyms were used in place of their real names to mask their identities. Member checking was also conducted for each participant, whereby a transcript copy of the participants' interviews was sent to them for completeness and accuracy validation (Birt et al., 2016). Data collection continued per participant through interviews until saturation was reached.

Pilot Study

A pilot was conducted in this study upon the Institutional Review Board's (IRB) approval of the proposal. The IRB approval was given on May 28, 2021 with the approval number of 05-28-21-0562989. The purpose of the pilot study was to determine the suitability of the primary study's interview questions' clarity from the potential participants' perspective, as well as to assess the effectiveness of the proposed data collection and analysis method (Doody & Doody, 2015). The data collection, the interview questions, and data analysis plan of the primary study was used for the pilot study. ITP managers were purposively selected for the pilot study to ensure that it is representative of the population of the primary study. The selection of the participants was based on the interested volunteers' knowledge about project management, and their role in successfully managing ITP. For the purposes of this study, a project was defined as successful where it is completed within cost, scope and budget, and the expected benefits are delivered. The selection of participants was based on their response to a poster on the LinkedIn network sent out ahead, asking for their interest to participate in the study. I reviewed the profiles of the volunteers against the selection criteria before selecting them. Snowballing (referral) and LinkedIn (LinkedIn.com) was used to select

four participants for the pilot study. The selected pilot study participants did not receive any monetary incentive.

During the pilot study, the participants were requested to suggest changes or make comments to the interview questions and data collection procedure where necessary. Participants were required to consent to the study and they were also advised that they have a right to exit from the pilot study at any time. The interviews were recorded and member-checked after it was transcribed. The experience and results from the pilot study was to be used to modify the interview questions and adjust the data collection procedure, if necessary.

Procedures for Recruitment, Participation, and Data Collection

During each interview, the selected participant was required to answer the research questions in this study. Interview questions were developed out of the research questions. The participants verbally responded to the questions and their responses were electronically recorded using audio recorder. I collected the data for this study from the participants during these interviews. Each interview was expected to last for one hour and the responses audio or video recorded. After each interview, the transcripts of the recorded responses were sent by email to the participant for member checking. The participants were required to confirm or object to the transcript of the recording by reply to the email within a stipulated time period. In the event of any clarification, a follow-up interview of the participant was to be conducted. Upon confirmation of the participant, data analysis was performed, starting with the initial coding stage process. The data collection process was iterative, hence for each new participant, the coding was revisited

and frequently occurring codes were identified. I estimated that it will take about five days to recruit and collect data from two participants, including coding. The data collection and analysis's total duration was determined when theoretical saturation was achieved (see Gill, 2020).

Data Analysis Plan

A qualitative grounded theory study involves iterative data collection and analysis. During data analysis, data was collected, coded and categorized. Subsequently, themes were generated from the categorized data while reflecting on the research questions so as to find the answers to the research questions. NVivo® qualitative analysis software (QDAS) was used for organizing and analyzing interview data that was collected during the study. QDAS has been used by researchers to support qualitative research process by making it easier enabling the researcher to focus on the research questions (Woods et al., 2016).

In qualitative research, a code is often referenced as a visual symbolic expression in the form of a word or phrase representing the main captivating summary of an attribute of qualitative data (Burkholder et al., 2016). Codes are later converted to categories to generate themes that will become the foundation for an emergent theory. Due to the iterative nature of the grounded study, coding was in multiple cycles, leading to the creation of categories.

Coding was conducted in three main stages or cycles: initial coding, which was followed by focused coding, and finally, theoretical coding (Charmaz, 2006; Charmaz, 2017). The first cycle codes were to obtain ideas from the participants' quotes in line with

the research questions. In the second stage or cycle, which was another coding activity, the focus was on grouping the first cycle codes logically in categories in a form that starts to make thematic or conceptual sense (Burkholder et al., 2016). During the focused coding, multiple categories were then compared and joined to describe new constructs logically drawn from the coded data. The last stage was the theoretical coding, which involved the generation of themes from the categories, while comparing and consolidating all constructs and themes earlier generated from all sources. The theoretical coding process established the link between the data and the research questions, hence the researcher was able to explore the answers to, *what*, *how* and *why* in the phenomenon. Primarily, identifying significant themes across all the data sources was the aim of the data analysis.

Issues of Trustworthiness

Trust is of concern in qualitative studies due to the unique method of sampling, data collection, and analysis involved in the research process. Qualitative research does not seek generalization or the form of validation expected from quantitative research, whereby the outcome from a study is expected to be repeatable and potentially lead to the same findings (Gill, 2020). The findings from qualitative research studies are based on real-life experience and stories narrated to the researcher by the purposively selected participants (Stahl & King, 2020). Therefore, the concern is how much the outcome of the study can be trusted.

According to Lincoln and Guba (as cited in Stahl & King, 2020), there are four issues that are important in expressing the trustworthiness of a qualitative research, namely, credibility, transferability, dependability, and conformability.

Credibility

Credibility ensures that the phenomenon being investigated is described as the way it really is or was, unadulterated by the researcher's opinion (Glaser & Strauss, 2017). Triangulation is one method of ensuring credibility, by using various methods and sources of data to perform the research processes (Stahl & King, 2020). The data collection and analysis methods used in this study were well developed and have been used in social researchers (Wiesche et al., 2017). The sampling technique being purposive added to the quality and meaning of the data. To minimize the negative effect of lack of credibility, three different data collection stages, namely interview, review of videos with transcript, and review of field noted, were adopted. Member checking was used during the data analysis to ensure the accuracy of the information and also enhances credibility. The grounded study approach involves coding, categorizing, and thematic coding. These steps deepen the researcher’s understanding of the phenomenon and are relevant for theory construction and credibility establishment.

Transferability

Transferability ensures the availability of essential research artefacts to readers. Such artefacts will include the field notes, methods and detailed descriptions of steps followed in the study. The nature of qualitative studies is that the research findings are not easily transferable or generalizable as the circumstances vary and sample population

usually small (Stahl & King, 2020). Stahl & King expressed that in certain situations the findings from a qualitative study for a particular phenomenon may be related to other similar situations and can be applied in them. This assertion applied to this study. To ensure that the findings can be transferred, a detailed description of the method used in this qualitative research, including field notes to further help the reader relate to the findings, were elaborated in details. Besides, the coding sheet and the transcripts are included in the study report.

Dependability

The dependability strategy is focused on making sure that the research can be trusted by the interested audience (Stahl & King, 2020). This is more like trusting the trustworthiness of the research. The main concern in this issue of dependability is ensuring that the biases, assumptions and reflexivity of the researcher are well documented in the field during data collection and analysis. Keys steps were taken to ensure that the dependability of this research. These steps included, (a) a documented justification for the use of the grounded theory approach in this research, (b) a detailed description of the data collection method, and (c) decisions and field notes created during the data analysis and substantive theory discovery showing reflectivity (Stahl & King, 2020).

Confirmability

Confirmability deals with putting practicable steps in place to ensure that the outcome or findings from the research are true accounts of the participants' experiences, rather than the researcher’s preferred expectation (Stahl & King, 2020). The key focus of

confirmability is on the objectivity of the research finding, which is driven by the ability of the research to remain unbiased throughout the study, starting from participants' selection to data analysis. To achieve confirmability in this study, biases were minimized by using field note memos, audio recording to tape, and interview transcript review. A clear and description of how diverse themes were reflected upon and emergent themes generated during data analysis is provided.

Ethical Procedures

Ethical standards involve impropriety and misconduct, which will be prevented to protect all participants' integrity and guarantee them equal rights (Flick, 2018). Recruited participants who may not wish to continue with the interview were allowed to withdraw from the study at any point (Alvesson & Sköldberg, 2017). Throughout the study, protection of confidentiality and adherence to privacy concerns were of utmost priority. To further ensure confidentiality, data collected during the study is kept in a secured cloud drive and personal computer with password protection for five years from the study's completion (Tie et al., 2019). The access to this data is available to only the researcher. The protected confidential data collected during the research study will be destroyed 5 years after the completion of this study (Birks & Mills, 2015).

To achieve the ethical requirements and successfully contribute to positive social change, the following actions were taken in the conduct of this research; namely, (a) clear communication of the purpose of the research to participants, (b) ensuring that participants consent to, understand the research methods, and play their roles in the data collection process, (c) involvement of the Institutional Review Board in the data

collection plan, (d) ensuring that the research language was not discriminative or biased against any age, religion or group, and (e) credit all participants who played a part in the research work, by using appropriate citation and acknowledgments. Member checking was performed for each interview, giving the participant a chance to confirm the transcript interview's accuracy and validity (Flick, 2018). Anonymity was guaranteed by removing all participants' information that could potentially lead to the participants' personal identification (Merriam & Grenier, 2018). The informed consent form was provided and included vital information such as the identity of the researcher, detail on how participants were selected, the purpose of the research, risks involved, gains for participation, assurance of confidentiality and anonymity, level and type of participation needed from the participant, and who to contact if questions arise. To achieve anonymity or confidentiality in research, investigators use pseudonyms and aliases for individuals and places. An analysis of data, real names of participants, and locations was not used to ensure confidentiality. Surmiak (2018) suggested that for investigators to maintain respondents' anonymity, they must alter the significant features of the research as long as it does not touch the integrity of their work. They should not circulate or publicize their report if the subject's identity cannot be concealed. Although the use of pseudonyms in research does not give an assurance of confidentiality, anonymity or confidentiality practice is one way of ensuring that respect for personal principles is adhered to and reducing respondents harm exposure.

Walden University's Institutional Review Boards (IRB) approved the proposal in May 2021 with the reference number of 05-28-21-0562989. The IRB was responsible for

ensuring that the study was performed following the guidelines of research ethics by carrying out a comprehensive assessment of research proposals using experts in research ethics who are also conversant with social science practices techniques.

Summary

The qualitative research methodology in this chapter explained the design used to explore practitioners' project process management practices in successful information technology projects, leading to the development of a theory describing how to best use project management processes in practice to achieve success. The strategic plan, methods, and rationales for instrumentation, recruitment, participants' selection, data collection, and analysis were described. Considerations for trustworthiness and ethics are also detailed, showing how these will be assured in this study. In Chapters 4 and 5, the actual data analysis and results showing the study finding is discussed.

Chapter 4: Results

The purpose of this qualitative grounded theory study was to explore project process management practices of practitioners in successful ITPs and develop a theory describing how to best use project management processes in practice to achieve a successful outcome. Investments in ITPs are anticipated to improve quality of life and stimulate economic growth (African Development Bank, 2018), yet over two-thirds of ITPs are not successful mainly due to project management practices. While project management has evolved, there remains limited underlying theory or guide of how the processes fit together or which processes are more success-critical than others (Padalkar & Gopinath, 2016; PMI, 2017). The specific problem was that ITP practitioners manage project processes in diverse ways without clear guiding principles in terms of what does or does not work in practice to make ITP successful (Herrera et al., 2020).

The main research question that guided this qualitative grounded theory study was "What practices in process management do information technology project practitioners rely upon as guiding principles in a successful information technology project?" Other research questions that helped in exploring the phenomenon were:

RQ1. How do project practitioners describe process management elements and process purpose in successful information technology projects?

RQ2. How do project practitioners describe process management feedback mechanisms, including the interactions among project processes, in successful information technology projects?

RQ3. What do project practitioners perceive as the best way to apply process management principles towards ensuring project survival, stability, and adaptability in information technology projects?

Before carrying out the main study, a pilot study was first initiated. This chapter includes the discussion of the pilot study results, the main study settings, demographics, data collection, and data analysis. Finally, evidence of trustworthiness and results discussions is presented, along with a summary of the chapter.

Pilot Study

A pilot study was conducted upon the Institutional Review Board's (IRB) approval of the proposal. Walden University's approval number for this study is 05-28-21-0562989. The purpose of the pilot study was to determine the suitability of the primary study's interview questions' clarity from the potential participants' perspective, as well as to assess the effectiveness of the proposed data collection and analysis method (see Doody & Doody, 2015). The data collection, the interview questions, and data analysis plan of the primary study were used for the pilot study to ascertain their suitability. ITP managers, who were also the project practitioners responsible for a project's execution, were purposively selected for the pilot study. The selection of the participants was based on the volunteers' knowledge about project management and their role in successfully managing ITP. As part of the process, profiles of the participants were reviewed first to determine their suitability. LinkedIn (LinkedIn.com) and, subsequently, the snowballing (referral) technique were used to select four participants for the pilot study.

During the pilot study, the participants were requested to suggest changes or make comments to the interview questions and data collection procedure where necessary. The interview was recorded and member-checked after it was transcribed. The interviews were transcribed with the help of Otter® Software. Initial coding was performed on the interview transcripts using Nvivo® Software. The coding results from the initial four pilot participants (PP1 to PP4) progressed as expected in the research data collection and analysis plan. The feedback from the participants and the results from the pilot study did not suggest any need to modify the interview questions or adjust the data collection procedure. Hence, the data collection and analysis strategy were not changed and the results of the first four samples were considered as the first four samples for the main study.

Research Setting

All the interviews were conducted on a mutually agreed schedule. Two of the 14 selected participants were interviewed over a phone call while the other 12 participants were through Zoom® calls. The Zoom® video sessions were recorded. While some participants chose to turn off their cameras during the call, others preferred to have the camera on. Pseudonyms consisting of code numbers (PP1-PP14) were assigned to each of the participant to hide their identities. I interviewed the participants using a mutually agreed medium. The interviews were recorded and transcribed. All the interviews took place at the participant's convenience since each participant determined the suitable date and time for the interview. I ensured that the setting from where I connected to interview the participants was comfortable in terms of privacy such that no one, including people

staying with me in the residence where I joined the calls, could see the participant or overhear my conversation with the participant.

Demographics

The participants were recruited through LinkedIn and snowball sampling. The participants all identified themselves to be project manager and practitioners responsible for the respective successful ITP they were interviewed on. No demographic information was collected or used in this study. This was in line with the nature and design of this study, where the focus was on the process and the outcome of the project, regardless of the demography. However, specific characteristics of the projects were collected, such as the nature of the projects and the role of the participant in relation to the ITP they directly managed. Table 1 shows how the characteristics of the participants were distributed from a role perspective.

Table 1

The Role of the Participant in Relation to the ITP Organization

Project Manager's Organization	Number of Projects	Percentage
Internal Employee	8	57%
Supplier's Employee	6	43%
Total	14	100%

Each participant identified themselves as the project manager of the ITP, either belonging to the organization benefiting directly from the project or as a supplier providing the IT systems or solution.

Data Collection

I posted flyers to the social network, LinkedIn (LinkedIn.com), to reach ITP practitioners for the purpose of recruiting potential volunteers. I also requested through the IRB Support Specialist to use the Walden University Participant Pool, and on approval my study was posted to their portal. To determine that the volunteer met the criteria, I reviewed the volunteers profile on LinkedIn and other sources to ascertain that the volunteer has project management experience.

A total of 16 volunteers contacted me and I emailed a copy of the consent form to each of them, out of which 14 participants consented, asking me to move forward. Two participants were not selected because they disclosed to me that they did not have project management experience. Interviews were scheduled to meet at the researcher and the participant's convenience. I conducted 14 in-depth one-on-one individual interviews with each of the participants starting from June to October 2021. Each interview lasted between 35 minutes and 60 minutes, and at an average of 40 minutes per participant. I interviewed the selected volunteer via phone and Zoom® platform. The interviews were audio recorded. One participant (PP10) had to end the interview about 10 minutes into the call to attend to an important personal topic for about five minutes. We resumed the interview afterwards with that participant, without impacting on the expectations from the responses or the participant's mode throughout the duration. Another participant (PP9) had a very poor network connection, and this resulted in several repetitions to clarify interview questions and responses. The internet connectivity problem did not negatively impact on the outcome of the discussions. The interviews were recorded and transcribed

with the help of Otter® Software. Although I did not explicitly indicate the use of Otter® Software in my research method in Chapter 3, I found the software useful after I had some time constraints in personally transcribing the interviews. The use of Otter® Software did not negatively affect the outcome of the interview process. Recorded interviews and transcripts are stored electronically in files on the researcher's password-protected Google Cloud® drive account.

A post interview question was asked requesting the participant to share the study's flyer to other potential volunteer to recruit more participants. Participants were contacted by email for member checking after transcription and initial coding so that the participant can validate whether the data could be included in the study. Once I reached theoretical saturation for the study, I removed the flyer from the social network, LinkedIn (LinkedIn.com). At the same time, I sent an email to IRB Support Specialist to remove the study posting from the Walden University Participants Pool portal. Table 2 shows the distribution of participants' interviews by months.

Table 2

Schedule Showing Interviewed Participant with Dates

	Participants Interviewed	Count	Percentage
June 2021	PP1, PP2	2	14%
July 2021	PP3	1	7%
August 2021	PP4	1	7%
September 2021	PP5, PP6, PP7, PP8, PP9, PP10, PP11, PP12	8	57%
October 2021	PP13,PP14	2	14%
	Total	14	100%

About 57% (*n*=8) of the interviews, being the highest number of interviews, were conducted in September 2021, while the lowest numbers 7% (*n*=1) were in July and August 2021. Two interviews each were conducted in June 2021 and two in October 2021 representing 14% each. The high number of participants' interview in September 2021 was due to the convenience of the researcher. Since each interview lasted for an average of 40 minutes, there was sufficient time to complete eight interviews in one month; hence there was no adverse impact on the outcome of the interview.

Data Analysis

In this grounded theory study, data analysis started with collecting the first participant's validated interview transcript. The data was uploaded into Nvivo® Software and recorded with the pseudonym of the participant. Coding was conducted in three main stages: initial coding, followed by focused coding, and, finally, theoretical coding.

Stage1

The initial coding (or first cycle coding) was performed on the interview transcripts with the help of Nvivo® Software by highlighting parts of the relevant transcript and coding each of them as a reference code. Each code was thought of as a phrase that closely abstracts the ITP process management practice described by the participant in the transcript text. The first interview was coded separately, starting from the beginning of the transcript text to the end. Subsequent interview transcripts from other participants were coded subsequently, one after the other. As I read through the interview transcripts, I compared the participant's statements with previous codes from the previous participants. If the ideas and meanings are the same as an existing code, I

keep the old code and merged the new reference to the new code; otherwise, I created a new code.

For example, when PP1 was asked to talk about the project they managed from start to finish, the PP1 went on and explained how they understood the problem that the project was intended to solved and how important it is to the organization that the project was successful, PP1 said:

> The outcome and the business value of the project is that first point, this is the full digitalization of the risk reporting process, saving some additional capabilities of risk experts within the group function. And probably also, one of the crucial topics is that currently, our company is compliant with the new regulation that is coming into life at the end of 2021. There is a new revenue regulation in Germany regarding the risk assessment process, and this system enables us to be compliant with the new requirements.

This was coded as *"being aware of the urgency to solve a real problem"*. Subsequently, while coding PP2's transcript, the response by PP2 regarding the same question above was:

> Project name is IT Inventory CleanUp Project that is based on inventory master file - the application the company was using at the time - with the records of all items and materials we use in all the sites of the factories and locations of the company. So, the project is based on cleaning up the file so that you don't carry unnecessary load and costs and manage, the inventory, better going forward.

Upon comparing the statement by PP2 with previous codes and data from PP1, I found that the data were both speaking about the need to solve a real problem, so applied the previously generated code *"being aware of the urgency to solve a real problem"* to the PP2's statement as its initial code.

In some cases, the participant may have described a process that represented an activity that was performed in a continuous manner. An example is where PP5 explained how they were committed to checking that their processes were being executed as planned, PP5 said:

> I would say we were in a state of continuous motion. And we were applying pressure where we needed to apply pressure; we were making changes as we went along.

This was coded as *"constantly comparing outcome with planned expectation"* to highlight the constant effort. There were cases where a segment of text from a transcript was also coded multiple times. This was done to ensure that the ideas the text conveyed was seen through various perspectives, as all the views were relevant in understanding the practitioner's intents in making the statement. For example, PP12 stated how they applied project management methodologies and how this was so critical to the ITP success, PP12 said:

> So certainly, we follow some basics of project management, you have a defined start point, you have a defined ending point, you have deliverables, and you have phases in between. But the approach, how we do the project, which people we involve, at what time and how we do the operational stuff, retrieving the data,

> how we configure the views, how we conduct the UAT or how the business stakeholders conduct the UAT. This is all based on our own methodology, which is, I guess, one of the critical success factors

The above quote from PP12 was coded as *"encouraging the use of proven procedure and practices"* and was also coded as "*tailoring methodology and processes"*. The aim was to highlight that a certain methodology was tailored as well as stress the important practice of adhering to the methodology during the project. Following these steps, I was able to arrive at a point of theoretical saturation where I was unable to generate new codes, rather was only applying existing codes on subsequent interview transcript data segments. Codes that were similar were merged in some cases to consolidate the meanings while maintaining the relevance of the messages expressed by the participants.

Stage 2

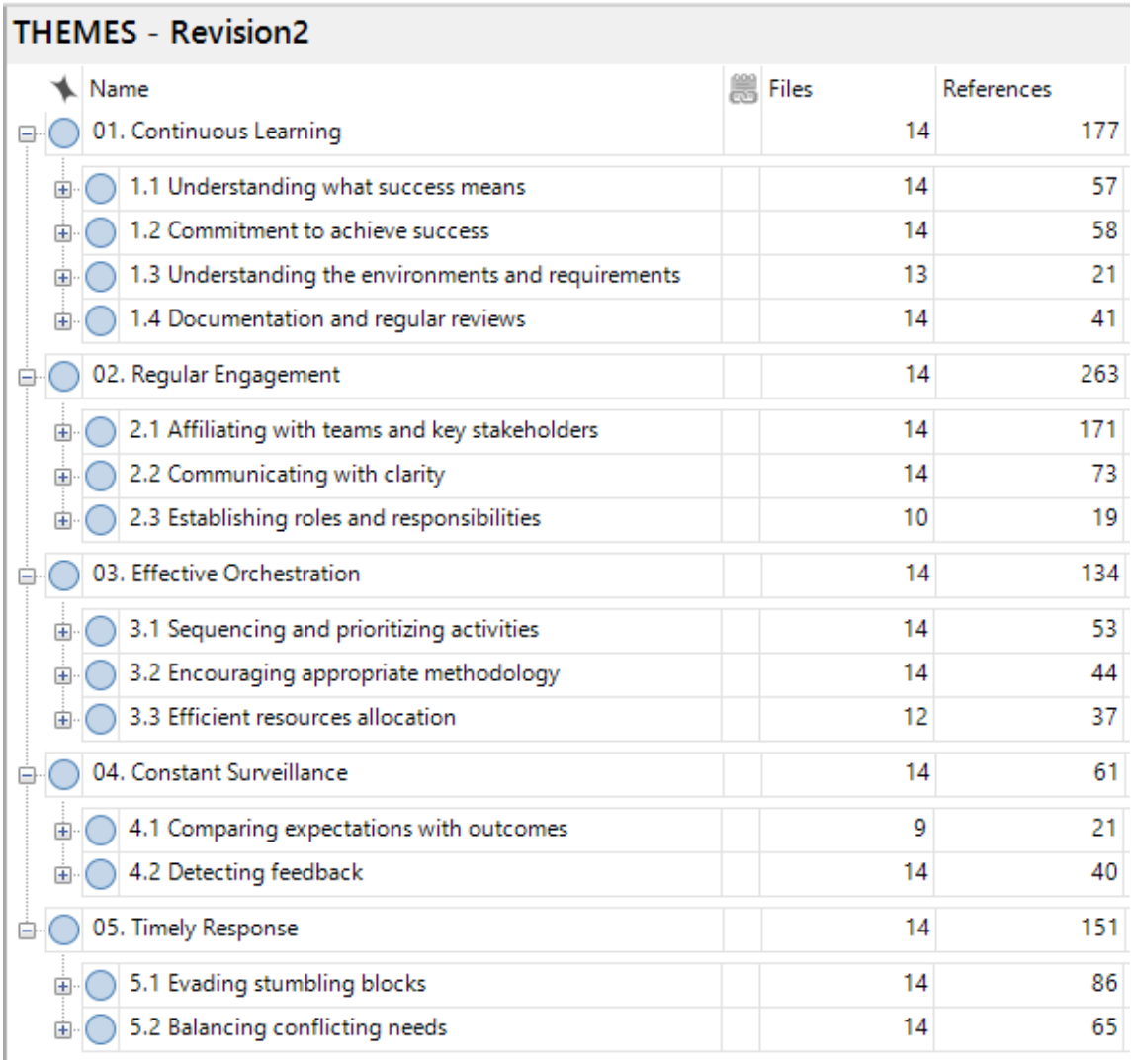
In the second stage, which is the focused cycle coding, I focused on logically grouping the first cycle codes into categories guided by the main research question and conceptual framework. During this stage, I selected some codes compared the transcript data behind each code across multiple transcripts, and logically described them as new constructs known as categories. For example, three codes *"constantly comparing outcome with planned expectation,"* "*controlling tasks within and between processes,"* and "*visualizing process output before starting them"* were categorized as *"Comparing expectations with outcomes."* The categorization helped in emphasizing the key practice that the participants described as significant in the ITP processes execution. Altogether, 14 categories were created from all the codes.

Stage 3

During the last stage, which is the theoretical coding, themes were developed from the categories as I compared and consolidated key constructs and themes earlier developed from all sources, including memos. The memos were generated during the interview and were used during the focused coding to provide further insights on the researcher thoughts on the interview day. Guided by the conceptual framework, five significant themes were identified distributed across 14 categories. Figure 2 shows the five themes generated with the help of Nvivo® Software showing the categories making up the themes, files representing the number of participants, and the references being the number of codes in each category.

Figure 2

A Summary of the Themes and Categories Generated During Data Analysis



THEMES - Revision2

Name	Files	References
01. Continuous Learning	14	177
1.1 Understanding what success means	14	57
1.2 Commitment to achieve success	14	58
1.3 Understanding the environments and requirements	13	21
1.4 Documentation and regular reviews	14	41
02. Regular Engagement	14	263
2.1 Affiliating with teams and key stakeholders	14	171
2.2 Communicating with clarity	14	73
2.3 Establishing roles and responsibilities	10	19
03. Effective Orchestration	14	134
3.1 Sequencing and prioritizing activities	14	53
3.2 Encouraging appropriate methodology	14	44
3.3 Efficient resources allocation	12	37
04. Constant Surveillance	14	61
4.1 Comparing expectations with outcomes	9	21
4.2 Detecting feedback	14	40
05. Timely Response	14	151
5.1 Evading stumbling blocks	14	86
5.2 Balancing conflicting needs	14	65

Note. The figure shows the theme and categories generated during data analysis indicating the number of files and references as extracted from Nvivo® Software project file used for the study.

The first theme, *"Continuous Learning,"* addressed the concept that described the group of ITP process practices that participants leveraged to sustain their commitment to

achieving successful outcome. The second theme, *"Regular Engagement,"* stated the practices which helped in the relationship management among teams and stakeholders to drive ITP success. *"Effective Orchestration"* was the third theme, which embodied practices that the practitioners focused on while ensuring that all activities in the project were harmoniously executed, without wasting resources. The fourth theme, *"Constant surveillance,"* represented the active attention and close observation to processes being implemented to detect feedback. The fifth theme, "*Timely Response,"* highlighted the ability of the practitioners to react or respond to events in processes and enabled successful ITP outcome. There was no discrepant case noted during the data analysis.

Evidence of Trustworthiness

Credibility

As described in Chapter 3, the essence of credibility strategy is to ensure that the participants experience is recorded and reported accurately, without being diluted by the researcher's opinion. Following the strategy, the participants were purposively selected and three interviews recorded, transcribed and analysed along with field notes. The field notes enabled me to ensure bracketing, hence minimizing biases. For example, I did not include my experience of project management in the data; rather I recorded in the field note what participants experience relates to my experiences. After each participants interview was transcribed, a copy was sent to the participant to review to ensure the accuracy of the information and also enhances credibility. Where corrections were made, the data was updated in Nvivo® Software as well before use. Subsequently, coding, categorizing, and thematic coding was performed.

Transferability

The transferability strategy described in Chapter 3 was used in the data collection and analysis of this study. The finding from this study may be used in other studies related to project management. This is underscored by Stahl and King's (2020) research which highlighted that in certain situations the findings from a qualitative study for a particular phenomenon may be related to other similar situations and can be applied in them. The artefacts used for this study are therefore preserved and can be accessible following a prescribed process.

Dependability

In Chapter 3, the steps that will be taken to ensure dependability was stated and these steps were followed during this study. Before carrying out the data collection, the justification for the use of the grounded theory approach was documented. The approach that would be used in the data collected was also documented and followed. Decisions and field notes created during the data analysis and substantive theory discovery also points to the reflectivity (Stahl & King, 2020).

Confirmability

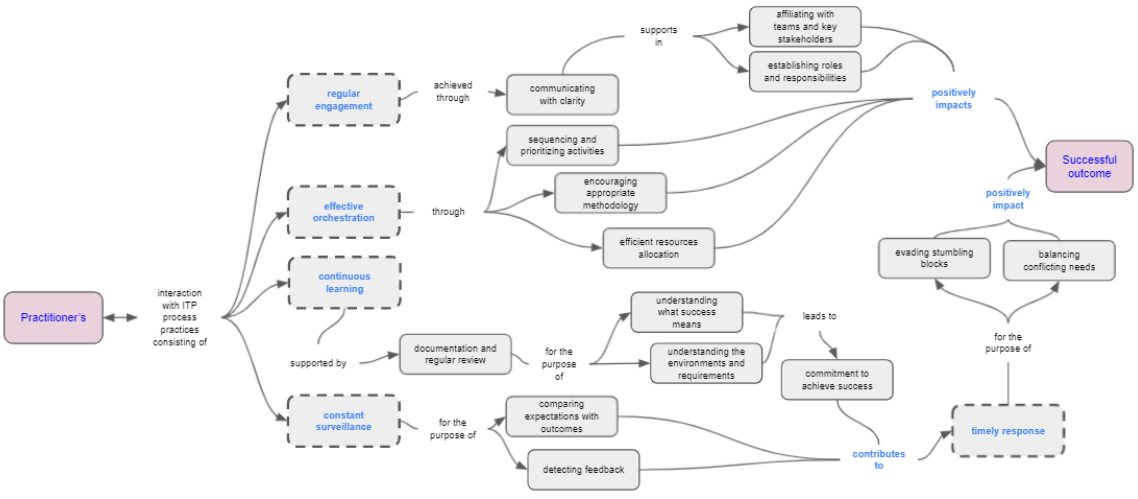
I followed the strategy described in Chapter 3 of this study to ensure conformability of this research. I was the instrument used in the data collection, and I personally selected the participants following the approved procedure described in Chapter 3. To further enrich the confirmability of this study, biases were eliminated by using field note memos, audio recording to tape, and interview transcript review.

Study Results

In depth interviews were conducted individually with 14 participants and data collected using 12 semistructured questionnaires aimed at answering three research questions. The three research questions were interrelated and all aimed to address the main research question, which was *"What practices in process management do information technology project practitioners rely upon as guiding principles in a successful information technology project?"* The responses from the participants were analyzed using grounded theory methodology, and five themes were identified. The themes are (a) Continuous Learning, (b) Regular Engagement, (c) Effective Orchestration, (d) Constant Surveillance, and (e) Timely Response. Figure 3 shows a concept map of the five themes and categories representing the concepts and their relationships which describes the principles in successful Information Technology Project (ITP).

Figure 3

The Concept map of Successful IT Project implementation Processes



Note. The concept map shows how to best use processes during project implementations as described by ITP practitioners. Created by J. O. Orazulike.

The dotted boxes in Figure 3 represent the themes, the solid boxes represent the categories while the arrows shows the relationship between the themes and categories, the blue coloured texts represent the key words explaining the principles, while the purple coloured boxes show the start (i.e., the practitioner) and the finish (i.e., a successful ITP outcome).

Theme 1: Continuous Learning

All the participants interviewed explained that they keyed into the problem that needed to be solved by the ITP they managed and set up a mind-set of zero tolerance for project failure. They read and listened to information required to build the knowledge about the ITP and what it meant to be successful. So they became resolute on the goal, determined to make sacrifices and bring in the experience needed for the success. Some unspoken expression of the participants also demonstrated the satisfaction they gained in making their respective projects a success. Their knowledge about the project kept them motivated in getting buy-in from all stakeholders by persuading them to also key into the ITP goal. The participants continuously and purposefully learnt and understood why and how the ITP must succeed. Table 3 shows the categories describing Theme 1 as identified from the participants namely, (a) Understanding what success means, (b) Commitment to achieve success, (c) Understanding the environments and requirements, and (d) Documentation and regular reviews.

Table 3

List of Categories and References Distribution of the Theme "Continuous Learning"

Categories	Number of Participants	Count of References
Documentation and regular reviews	14	57
Understanding what success means	14	57
Understanding the environments and requirements	13	21
Commitment to achieve success	14	58

Documentation and Regular Review of Events

When asked about one of the processes that enables successful outcome, the majority of the participants mentioned documentation and review of the documentations. Apparently, ITPs are riddled with so much technical information, and adherence to the details as expressed by PP11 and PP13 helped to keep the project going.

> PP11: Well, yes, we had meetings, and we actually took meeting notes. So there are project notes. So there was, we kept everything as far as during the project lifecycle. For any documents that were on a shared file for all of us, I'll get to this shared to insert or update what the status was, if it was prior to the meeting.
>
> PP13: people were comfortable in the knowledge that even if there are some processes that were, or some tasks that were tied to either a particular unit or a particular individual, and he or she slacks about that task during a session, people were comfortable and safe in the knowledge that because everything was documented, it could always be referred back to, in case a snag was hidden further down the road. The fact that all of the processes and all of the tasks that would have been flagged for successful limitation of the project was documented

somewhere, there was no fear of anybody or any particular task being a show stopper, because every step had been documented, every snag have been identified beforehand and documented for everyone to take note of.

Similarly, PP5 and PP9 explained that documentation added clarity to understanding and learning.

PP5: And, yeah, it's a lot to do, but we had to sit down and understand that. And then we documented it, we document it so that it's clear.

PP9: Also, we have proper documentation, you know, when we are doing any projects in this way, there must be a proper documentation, when you are moving from one phase to another, there must be a proper documentation of every activity, and then the outcomes, the deliverables we want to achieve.

PP7 explained that from a technical perspective, documentation was the only way to preserve knowledge, stating:

We made sure we documented and we teach all those aspect of technicalities, and then also password. We realised that, this have really helped us because when we needed to hand over the project, to a, an IT service provider, as agreed by the project board to hand over, to handle internally, it was a seamless thing for us.

PP9 did not explicitly mention documentation, but the practices involved in “handing over the projects to the management” involved documentation:

And then planning, this involves planning our resources or the human resources, physical resources putting everything together and then, execution is when we do the project, that's proper implementation of the project and then after the

> implementation then, after achieving our results, that's the closing, that's when after we finish the project is then we can now have a closing meeting and then handing over the projects to the management so which means for each process of the project there must be, at the end of each project, end of each phases, there must be a deliverables that comes out which will lead to the next phase.

Understanding What Success Means

Participants discussed the ITP they managed, often showing their deep understanding of the purpose of the project. PP5 and PP1 were outspoken about how urgent the problem was:

> PP5: And the business problem was really urgent, it was embarrassing, and they wanted to solve it. They wanted to have a place where they could go to at any point in time and check a particular project and say yes, this is the number of projects we have. These are the number of mats we have in place on ground, these are the number of mats that have been removed, and these are the number of mats that have been damaged or not.
>
> PP1: And probably also, one of the crucial topics is that currently, our company is compliant with the new regulation that is coming into life at the end of 2021.

PP12 presented a typical scenario from the ITP's business case to express their understanding of the success expectation, indicating the type of pain-point that must have led the organization to initiate the ITP:

> So you can imagine that a big company having a lot of this old ERP systems, they spend a lot of money just to keep them alive, they just need the data, not the

> systems. And that can eat up, up to 80%- and this is not our number, this is a number from analysts of a whole IT budget. It's painful for the companies if they spend so much money to keep up with system just for the data.

With regards to understanding why the project was initiated, PP10 indicated that specific communications were sent out to explain to the end users why the organization had to embark on the project:

> What we did was to communicate, have a session with them, subject them to rigorous consistent training, and make them understand that digitization process is actually meant to increase the efficiency of work to be done not to reduce manpower.

When I asked if the purpose was therefore success-focused, PP9 replies that it was indeed the purpose, because "if we are not successful in implementing it's just like we are wasting available resources at then at the end we abandon it." Similarly, PP5 stated:

> It's defining success and making sure everyone understands what success means. It wasn't just something we put on a on a notice board somewhere. Yeah, it was something that we made sure that every stakeholder understood what success meant.

PP2 and PP5 also held views there was a good understanding of the project purpose and that it was achieved:

> PP2: But at the end of the day, the end users the stakeholders were aligned with... with the project output, because at the end of the day, it achieved almost 100% of what you its set out to achieve. One is cost reduction. The inventory level was

> reduced, so in terms of holding costs, it was reduced from the finance point of view.
>
> PP5: But in the end, it was thought to be successful. Because we had a solution to really track, to help us track those mats and were able to say, yeah, at this point in time, this is what we have and that's what's been taken out. It just brought in a lot of accountability into the process.

PP10 expressed delight at the success of the ITP. The underlining point in this expression was the joy and passion that shows that understanding what the project meant led to commitment to achieving success:

> In terms of budgets, the project was successfully implemented within the scope of the budget, as approved by the executive management, and IT steering committee. And then in terms of schedule, we also implemented the project well on time, as scheduled in the, in the project plan, And also in terms of the effect of the project, yes, it was successful in the sense that the project went live, and was consummated by our valued customers and it met their expectations and our customers were happy with the product.

Understanding the Environments and Requirements

The participants stated at various times how they had a deep-dive into the requirements of the projects. PP13 and PP4 explained the importance of understanding the requirements as part of the learning process to achieve success:

> PP13: Because by the time you are about commencing implementation or while you are even still gathering requirements, if nothing is documented, you will not

> even know or be able to measure how much of what you actually require has been captured and understood by all parties.
>
> PP4: So, and then, of course, in the area of collecting requirements we make sure that we actually know exactly what we are trying to do, so that we define scope properly, we do the collection of requirements that we can now after doing the project work itself, we do a validation to be sure that what we are doing is actually what we set out to do in the first place.

PP5 and PP14 also indicated their reliance on documentation in understanding the environment during the project:

> PP5: And I we made sure that the stakeholders went through the document check process, and they agreed that yes, this is how it is. And then we documented what needed to change what needed to be done. So these we did before we even broke down things into sprints and all that. Before we defined the project, we made sure that the problem was clearly documented.
>
> PP14: So the first thing I did was, I used my project software management software, to like, start my project and sit down with the IT managers and found out what they wanted and what time frame, they were working with them. So we sit down, and we nailed out a timeframe where we can do parts because we were working with 5000 people.

Commitment to Achieve Success

The determination to achieve success was paramount to all the participants interviewed. An example is illustrated as quoted by PP11, PP5, and PP4. This includes efforts immediately solve a problem.

> PP11: But it already worked out that someone else was pointed to be on guard for that person who was out, just really worked out, it was a super project, everyone was really excited about it, it was what drove the project to success for me in my case, was that everyone knew that we could not survive without servers. And so we were all really just super on board and super excited to just influence the project as much as we could to make it a success.
>
> PP5: Like I said, if there was going to be a problem that would hit our budget, or timelines, I would consult with the team, after consulting with the team, I would consult with the sponsor, just to let him know what's going on.
>
> PP4: I think, generally in project management principles, we could say that we tried to make changes to suit what we are we are trying to work on. We tried to make little adjustments on our scope, like I said earlier, to ensure that whatever we have to offer from the product, whether it is in the future it is still very relevant.

Put causally, PP5 described the personal zeal and efforts made in getting tasks executed even if they felt like it was a discomfort:

> I recall that at the point, he [the sponsor] mentioned in one of our meetings that it looks like I'm stalking him, because I was always watching out for when he will

> be in the office, so that I can catch him and sit down with him and discuss the progress that's been made on the project and all that.

PP3 was also emotional when asked what they would do differently if the project was repeated to improve the results of the outcome. PP3 described the health impact received due to a commitment to ensure success, and hoping that it was a lot of sacrifice that they would like to avoid if possible:

> The project too so much of my mind, of my thoughts, of my time. I took it like life and death. It touched of my health a bit. I should have delegated, but I didn't want failure, so, I was totally in charge.

In summary, Theme 1 could be stated as: The practitioner's interaction with ITP process practice of continuous learning supported by documentation and regular review for the purpose of understanding what success means and understanding the environments and requirements leads to commitment to achieve success contributes to timely response.

Theme 2: Regular Engagement

Regular and appropriate engagement of the project practitioner with the right teams and stakeholders describes Theme 2. Most participants said that they identified the right resources and stakeholders for the project and started building relationships with them as early as possible. They actively listened to the teams and were visibly seen to show the need to achieve a common goal, which was ITP successful outcome. Some participants stated that they had both formal and non-formal affiliation with team members and other stakeholders with the aim of understanding their social and cultural differences. In communicating, the participants said they were clear about the best means

and time to send a message and the purpose of the communication. As shown in Table 4, Theme 2 is made up of three categories, namely, (a) Affiliating with teams and key stakeholders, (b) Communicating with clarity, and (c) Establishing roles and responsibilities.

Table 4

List of Categories and References Distribution of the Theme "Regular Engagement"

Category	Number of Participants	Count of References
Communicating with clarity	14	73
Affiliating with teams and key stakeholders	14	171
Establishing roles and responsibilities	10	19

Communicating with Clarity

All the participants emphasised the role clear communications played in their respective ITP success. PP1 explained it using "transparency", according to P1, "So this was one of the … let's say may be principles ...and one that I have mentioned before, it was, let's say, transparency." PP11 and PP3 further added the prompt, directed, and timely approach, as well as the medium used in their communication:

> PP11: I think communication is key. So I think communication is a great principle, whether it's via email, or team meetings, or just picking up the phone to you know, just have a conversation about the project, communications is key.
>
> PP3: I always communicate the consequences of not doing something. I will sell it clearly that, once you pass a message to somebody I need to act, you don't have that blame again. So the responsibility lies on the person that it is escalated to. So

> people find that to take problem off my head let me just communicate, let me pass this message out.

PP10 also highlighted how consistent and regular the communication was, the people they interacted with and how it positively impacted the successful outcome of their ITPs.

> Okay, most useful practice behaviour was consistent interaction and communication between all the stakeholders and my team. That was the most useful behaviour, because the reason why I classify this as the most useful behaviour is because any break in communication, or any gap in communication can make the entire project to fail. But there was a consistent and efficient communication between all the team members, and the stakeholders, and that was one of the main reason why the project succeeded.

PP13 went on to mention that the communications were tailored, indicating an intention to make the communication clear to the different audiences.

> Yes, like I mentioned earlier the communication was to different levels of stakeholders or different types of stakeholders. So all we had to do was tailor our language, according to the intended audience. When we communicate with the end user, we use a different language that we use, and we have a different intent. And what we put into communicate to them, as compared to how we would communicate with the project sponsor, or with whoever it is that would approve the funds for implementing the project. So basically, just about tailoring our language towards the intended audience.

In summary, the effectiveness of the communications was intended to improve the level of engagement among the team members and stakeholders, and result in affiliations through open discussions, according to PP14 and PP1:

> PP14: Yeah, one practice that I did was communication. And I think that communication is a big thing within everything, because you got to communicate with the person who's going to sit in front of that computer, you have to communicate with the people who are installing the software and the people who are installing the hardware.
>
> PP1: Also sometimes to drive the discussion with the individuals, yes, to open them and really try to understand what bothers them, well, let's say what kind of the path we should take to, let's say, proceed successfully with the, with the project.

Affiliating with Teams and Key Stakeholders

A feeling of being a part of the group working towards a common goal of success was identified as an important element in ITP process management. This is expressed as affiliation, and was expressed in many ways by all the participants. In Theme 2, this category recorded the highest number of references (*n*=171). PP1 and PP10 for instance talked about meetings and its impacts on getting information or feedback:

> PP1: People were opening themselves during such meetings. So this was, let's say, more informal meetings, some kind of the coffee talk, this was always called coffee talk in the calendar. But I was able to get down to get from people some

more information, what was important, I have been using also some input from retrospective and my one to one with the product owner and the scrum master.

PP10: Well, one, there was, there was constant interaction with all the stakeholders of the project. So we consistently have interactive sessions to discuss the projects to discuss the challenges to discuss the risk also associated with the project and also discuss the resources - the resources that are needed to have the project, effectively implemented.

PP11 described that trust was important in achieving a great relationship with the teams, while PP12 looked at ITP process management from a social angle of understanding different culture, where the level of affiliation is increased due to the social engagements:

PP11: Another thing is - I think - very a good management principle is trust. It’s that your team trust you, and that people believe what you say. So you have to be a trustworthy person, you have to give them the truth.

PP12: I think what is always underestimated in project management in the IT world is the social component, you know, everybody's talking about the functional skills, you have to know about the system, you have to be able to code you have to be able to find your data whatsoever. That's important. But as a project manager, I would say the social skills are at least 50% of the success of a project manager, if you cannot talk to the people, if you cannot, if you don't know that if somebody is coming from a different culture, you have to treat him in a different way.

> PP13: Okay, so on this, what we identify from the start was the business need to involve the stakeholders as much as possible. That was the one major thing that we followed right from the start because for this project to be successful, every stakeholder had to be carried along step from the vendor partner, to the project sponsors, to the end users, to the IT units itself. So it was all about the stakeholders and as an extension of that the people involved. I think that was the major guiding light for this particular project.

Participants also explained how the affiliations helped in getting buy-in and on-boarding stakeholders. For instance, PP1 stated, “And I think the third success factor is that we had a strong support in the management team on the business side and IT site,” while PP10 said “first of all, we've got the buy-in of the executive management and the IT steering committee. Also the buy-in of the board of directors.” In summarizing how the various processes worked together, the idea of regular engagement through communication and ensuring affiliation was described by PP10 and PP5:

> PP10: So, this various processes put together, enables that project to sail through successfully because we didn’t just develop products are roll it out into the market, but we involved the key stakeholders, and including a few of our valued customers.
>
> PP5: And then the other key thing was a collaboration based communication and collaboration, just making sure that the key stakeholders is in the know. And then if there's a change, we make sure that we got them involved as well.

PP11, PP10, and PP1 pointed out that the stakeholders were not always within their organizations and therefore had to establish a layer of affiliation with them to achieve success:

> PP11: This was actually through, you know, coordinating this whole effort with our legal department outside vendors, so our team consisted of some really, in depth players, we did have a legal person on our on our team. Because the laws are different if you're doing an installation... well, country by country, the laws become very different.
>
> PP10: What we did was, like, at a point we had to consistently interact with the regulatory authority of the insurance industry. Now, because for any product you want to roll out into the market, you must have the buy-in, not just the buy-in of the executive management and the board of directors. But you must also the buy-in of the regulatory authority of the sector which we are playing in which is the insurance sector. So we got the buy-in of the regulatory authority.
>
> PP1: So for us, the most important thing was to have every day involved people from the business side, including the product owner, in taking every decision issuing every problem on the let's say, implementation level that was not purely technical.

Having the stakeholders and teams on-boarded was necessary but not sufficient. This was why many stakeholders went on to explain the roles and responsibilities the teams and stakeholders were assigned to ensure success.

Establishing Roles and Responsibilities

The participants explained that in dealing with the team and stakeholders, expectations were required of them for the various aspects of the processes in the ITP. PP2 and PP1 indicated that the role of a project sponsor and product owner was significant to success:

> PP2: One of the things I didn't mention was a getting a sponsor... That was initially difficult. But it is a process that was very very important - you must get a sponsor.
>
> PP1: early identification of the product owner, and from the almost first day, we have been working with the product owner from the business side - so, IT and business.

PP1 and PP9 further added the need to also avoid allocating the responsibility to the wrong team member or stakeholder:

> PP1: So what we have avoided to do is to we have avoided the situation that IT will take the full responsibility and accountability for the whole implementation.
>
> PP9: And then feedback. And also a resource plan - a resource plan in the sense that all the resources we need: the human resources, the capital resources, timing, everything must be planned and well documented.

PP14 on the other hand indicated that certain tasks were not in the responsibility of the project and needed to be isolated and handed over to the right team:

> You know, my deal was to get everything up and running. And then like I said, I had groups of people to train these people, and then to train their people to take over the people that didn't like the change and deal within their own department.

Theme 2 could be summarized as: the practitioner's interaction with ITP process practice of regular engagement achieved through communicating with clarity supports in affiliating with teams and key stakeholders and establishing roles and responsibilities positively impacts successful outcome.

Theme 3: Effective Orchestration

Practices that demonstrated ccontinuously prioritization, sequencing, and timely execution of activities of the processes to optimize the limited resources, is described using effective orchestration in Theme 3. All the participants explained in different ways that in executing the project processes, they knew what needed to be done, and which activities were on the critical path. They stated that they remained disciplined and followed professional ethical procedures in executing activities. Many participants cited cases of active documentation of only what is necessary, and following a clear methodology and tool that worked for the project. There were mentions of balancing people and process, and establishment of what should be done first, as well as assigning and scaling of process activities to accommodate their interdependencies. For example, PP8 explained about how processes were executed, "So if a developer is holding back or delaying he can always [be] reassigned, but make sure it does not affect the procedures. So we break down the project into frames that can be completed, can be joined and completed to make a whole or as each fraction is a system on their own." As shown in Table 5, Theme 3 is further explained under three categories identified during that study, namely, (a) Sequencing and prioritizing activities (b) Encouraging appropriate methodology, and (c) Timely resources allocation.

Table 5

List of Categories and References Distribution of the Theme "Effective Orchestration"

	Number of Participants	Count of References
Sequencing and prioritizing activities	14	171
Encouraging appropriate methodology	14	73
Timely resources allocation	10	19

Sequencing and Prioritizing Activities

The project managers tasked with executing the project identified the activities, assigned them to individuals and ensured that these were executed according to their priorities. PP2 and PP1 for example stated:

> PP2: Then at the execution point, when we had to execute the different schedules, we had to manage that very well, because executing these different processes and different levels and milestones was not only was not only dependent on the main members of the team, but also dependent on stakeholders outside our control.
>
> PP1: Even before the planning I was on a regular basis speaking to the product owner on the upcoming expectations on the let's say functionalities that should be implemented in the upcoming sprint

To further emphasize the prioritization impact on resources in the ITP, PP1 stated:

> PP1: I think we could have the bigger problems in the planning meetings with the whole team to really set up the priorities and be, let's say, realistic in terms of this what we can deliver.
>
> PP2: We did the budget proposal, considering all resources required in terms of human, material, time.

Things will not always work as expected, so there was always a reprioritization and sequencing practice reported by participants. For example, PP3 stated the practice of "continuously evaluating all the project tasks and aligning them with your targets all the time." This was supported by PP11 and PP3:

> PP11: So, the thing that ran a little bit... I want to say we ran into some problems with it, but I won't say, it wasn't that bad of a glitch, but we did have to call it out. But, there was a timeframe that we needed it, but say the servers needed to sit in customs for a certain amount of time. That's something that we had to build into the lifecycle of the project.
>
> PP3: And if you bring ATM to site, and the communications guys are not there, then the ATM installer cannot finish his job, you know. If you don't communicate directly with the head office to set up the ATM parameter, where you will spend a day, you will spent three days, paying hotel bills. Because we don't have one engineer per ATM site, we sequenced it that by day two this installation will finish, we move to this place.

Encouraging Appropriate Methodology

With regards to process and methodology, PP4 stated that customizing the project processes was essential, while PP7 and PP1 described the need to enforce and encourage the use of an adopted process:

> PP4: And then, in the processes, we try to tailor processes to suit our project. We don't necessarily implement it to the teeth the way they are; we try to modernize them just to make sure that it suits what we are doing.

> PP7: So, you must follow it methodologically and then for more phases it leads to the other because without completing the process, you cannot move on to the next phase. So, it means a process must be accomplished and then the research deliverables from one process will lead to the next phase.
>
> PP1: So as you can see, we have been adopting a bit, the methodology and the tools that we had available in the, in the scrum framework, really be a bit more flexible than the required by the framework.

There was an aspect of tools and techniques, which PP1 stated "we have been using purely Scrum techniques to assess the requirements for resources and the let's say capabilities of people." Furthermore, PP1 and PP8 highlighted that the idea was to ensure consistency in the practice among every team member:

> PP1: We have been using JIRA to maintain our backlog and also to track let's say the progress of each and every single team member on the topics.
>
> PP8: Mostly as developers, we share messages via Slack and since its remotes, our time for interaction is almost 24 hours but we limit to at least there is a meeting time where everyone has to be online.

In summary, PP12 emphasized that the use of an appropriate tool and methodology directly impacted success:

> But the approach, how we do the project, which people we involve, at what time and how we do the operational stuff, retrieving the data, how we configure the views, how we conduct the UAT or how the business stakeholders conduct the

UAT. This is all based on our own methodology, which is, I guess, one of the critical success factors.

Efficient Resources Allocation

As task and processes are executed by individuals, it was important to the participants that these tasks were efficiently allocated to ensure effective execution. According to PP1 and PP12:

PP1: Yes, so we were able to check how many let's say tasks and issues can one person address within two weeks of sprint and we have been using this information as an input for the planning of the next sprint. The

PP12: the earlier I know the people and the earlier I know there is no internal know how left anymore in the company regarding system we have to create, the earlier I can start mitigating now. For example, we try to find the vendor of the software, maybe he still sells it, maybe there's a consulting company who has knowhow maybe we have some know how somewhere.

Resources were allocation and there was also time allocated to each process for the team members to respect. Therefore, PP2 and PP13 further stated purpose of the practice of allocating resources efficiently:

PP2: It sharpened the behaviour of the people: you know your deadline, and you must meet your deadline as per product and as per goal, so that you don’t delay the entire team or team members.

PP13: There was no other project that was stealing time and resources away from this one, because it was the first one. So everybody was able to dedicate all of

> their attention to it. And we were able to take all of the time prior to the commencement of the very first project, which was this to fully identify every single thing that we needed to document and then start.

PP11 and PP12 also noted that was important that the resources are skilled:

> PP11: And it was successful because I had staffs that were well seasoned, and everybody knew what parts they were going to play in the project.
>
> PP12: So finding the people, finding people having the skills is really crucial. And the earlier we find them, the more we can, the more we see what's coming up to us content wise.

The act of balancing resources and ensuring that the processes are synched appropriately during execution was described by participants. When things did not work out as planned, PP11 stated:

> The problem was things that were a little bit out of my control was the government shutting down how to re-invest time into rescheduling the meeting then I, you know, is trying to juggle several people's calendars and things everyone was seasoned, they were all on top other projects as well.

Theme 3 can be summarized: the practitioner’s interaction with ITP process practice of effective orchestration through sequencing and prioritizing activities, encouraging appropriate methodology, and efficient resources allocation positively impacts successful outcome.

Theme 4: Constant Surveillance

The practices of constant surveillance to observe external and internal threats was identifies as Theme 4. Participants reported that there could be deviations from expected quality, tests not going as planned, people slowing down due to sickness or emotional stress, loss of interest by stakeholder, and many more threats. In these cases, the project manager went into sensing and detection process to identify external or internal variations or changes that could threaten the survival of the project and its stability. In some cases, the project manager continually monitored, listened and synthesized what was heard or seen in the context of the knowledge gained about the project - why the ITP must succeed and how it must succeed. Table 6 shows the categories that make up Theme 4, which were identified during the study, namely, (a) Comparing expectations with outcomes, and (b) Detecting feedback.

Table 6

List of Categories and References Distribution of the Theme "Constant Surveillance"

	Number of Participants	Count of References
Comparing expectations with outcomes	9	21
Detecting feedback	14	40

Comparing Expectations with Outcomes

The participants were certain about the big picture of what was expected based on what they planned. According to PP1, **"**So when starting the planning, we had some kind of the first picture of this what we want to want to achieve in the current sprint." This is an indication of the surveillance practice. While these are a comparison of expectation

with outcome, the project manager also had a practice of reacting to what was noticed. PP1 further added:

> If we are not able to deliver something, as it was planned and agreed, we are raising hands as soon as possible to avoid any misunderstanding in the later stage of the project

As part of the project management process, a specific testing practice was an essential constituent of ensuring that the right persons were involved in the testing. PP10 stated the need of involving various stakeholders during the testing process:

> We also involved some of our valued customers to join us in the testing, of that product, which way to call the pilot tests. The essence of involving our valued customers - just a few of our value customers - is to have a feel of how the customers will see the digitization process of that product, and it went well successfully.

The project managers were intentional about the surveillance and comparing output because they also had a plan if anything showed up. According to PP3:

> Yeah. Then we say okay, this one if this happens, this is what we will do, if this happens, this is what we will do; if this does not work, this is what will happen. If this does not work, that means this has failed, so kick off Plan B.

Detecting Feedback

The participants also relied on feedback mechanisms to achieve surveillance and keep the project on track to success. According to PP10:

> Well, the feedback mechanism actually assisted in a great way. In that sometimes we just need to reconfirm you know, what has been agreed upon, or the particular outcome for instance, I will give a particular example. Before the testing of the software, we actually mapped out the expectation, the outcome - what we're actually anticipating during the testing.

PP3 also indicated that the feedback received will not always be positive and that the negative feedback was indeed greatly sought out:

> Not everything will go as planned at the micro level. What we always tell our vendor is we don't want to be given good news; that we are more interested in bad news, because we are hired to manage exceptions.

PP11 expressed frustration in the project they managed, especially where the feedback was not coming forth. In that sense, the participant explained that it would have helped if there was a chance to improve the project outcome if one of the key stakeholders had provided some feedback on time:

> So that's the only thing I would probably change is wanting to know, maybe get a little bit of a heads up from the president when he's gonna shut down all the businesses that's what he did all the businesses everything close.

PP12 and PP4 also mentioned that a lack of feedback could have derailed some project process execution:

> PP12: But sometimes, it certainly can happen that you have suddenly additional requirements, which could be that you have a signed off requirement document. And then they say like, Oh, we totally forgot to ask this and that department and

they have some more requirements, because we forgot to factor in that there are three more plants on the east coast.

PP4: There was a time we didn't know that we will require certain server configurations to be able to test certain things that we are doing. So at a point we had to go back to go and subscribe to certain services, configure servers to make it available for us to actually test. So it tried to derail us a little bit but somehow we managed to still get back to track so that's it.

The summary of Theme 4 is stated as: the practitioner's interaction with ITP process practice of constant surveillance for the purpose of comparing expectations with outcomes and detecting feedback contributes to timely response.

Theme 5: Timely Response

Promptly responding to expected and unforeseen developments is the practice behind Theme 5. All the participants in managing their respective projects acted on information received. Sometimes doing nothing about information received was perceived as a good enough response. Participants explained that some events turned out to be noise, which must be ignored. In some cases, actions were taken – like consequence management, according to them. In some of the cases, the participants cited responses to feedback and control measures to adapt and stabilize the project such as: moving to close proximity to the project site, initiating deployment of new better-skilled team members, swapping resources, giving encouraging words to the teams to motivate them, putting more pressure on sponsors or key stakeholder, and taking a tough stand by email or face-

to-face conversation. Table 7 shows the categories of Theme 5, consisting of (a) Evading stumbling blocks and (b) Balancing conflicting needs.

Table 7

List of Categories and References Distribution of the Theme "Timely Response"

	Number of Participants	Count of References
Evading stumbling blocks	14	86
Balancing conflicting needs	14	65

Evading Stumbling Blocks

Since the project is executed in uncontrolled environment, events that are unplanned posed a stumbling block or show-stoppers to successful outcome. PP1 for instance stated that they recognized stumbling blocks and took steps to prevent project failures by adapting to changes:

> Because the first initial meeting took place one day before the start of the pandemic in our headquarters. And the previous plan was to have the working team in place in the headquarters from the vendor and IT site and the business. But at the end, everything was performed for 100%, in a remote manner. So we have adopted I think, perfectly to the new, let's say new situation in the whole world, yes, especially in the pandemic

PP11 had a scenario where they utilized weekends to perform processes that otherwise would have been done on a weekday, but doing them on weekdays would have led to setbacks:

> I would say coordinating the efforts with our external vendors and delivery... its almost like from sea to shore. So if we had a delivery on the docks, it may not arrive to the office or to the organisation to be set up in time due to maybe a weekend, or you know, we had to build in, you know, initially looking at a calendar, you have to build in all your weekends, you have to build in all your holidays, and holidays from country to country, just varies.

PP4 mentioned unknown risks that showered up during the implementation, and they immediately avoided the impact:

> PP4: If you look at the fact that we did not do a proper risk analysis it trickled down to... it affected our scheduling and to some extent and our scope, because we had to change scope to accommodate the fact that there are some servers that we need to configure.
>
> PP4: So because of that, we know that the foundation of our projects is still strong. But we had to make some changes to the basics of the design. So it affected our scope, it also affected our schedule - with the time we do that. But currently it did not affect our budget - just like I told you earlier worked on a specific budget, we had an understanding within ourselves on what we need to do. So, I think it really affected it: the environment added some change. But like I said, generally we're still stable, and we still adapted to suit - to still be relevant and make our project still relevant.

In the case of PP9, the events that could lead to project failure were identified during the management review. Action plans were defined and acted upon using corrective measures before the end of the project.

> PP9: So, in many occasions we have a case whereby maybe when the project is still ongoing, there might be case where we did not meet up to the management expectation and they ask us for a corrective event.
>
> PP9: Yes, we follow a according to the plan both at the time, you know, at times, you might have a little contingency that might arise and then all these things are being also is still in the plan also, because in any time there must be a contingency plan too, you know, that is the plan B - okay, what if this fails, you can quickly switch to the next plan. So everything is still working.

Balancing Conflicting Needs

The participants stated that response to unexpected events could lead to changes in resources allocation. This was explained in the words of PP1 and PP11:

> PP1: Yes, so we were able to check how many let's say tasks and issues can one person address within two weeks of sprint and we have been using this information as an input for the planning of the next sprint.
>
> PP11: You know, you are on the biggest and baddest baseball team, right or Basketball team, and you're all very seasoned. So when a player gets hurt or when the player needs to be out, in other words, my team then, they either would point out who would be their successor, in this case, or I would have to go and interview another party.

PP12 and PP3 described that there was interdependencies on resources which helped in balancing conflicting needs:

> PP12: I don't know the proper English word for it, but short ways, and willing to be proactively part of the project, really wanting to help each other is really a big thing. And from our side, and certainly from the customer side, the less fluctuation you have during the project, the better. I mean, at the end, it takes two years, you know, and we had it, I had it in my life several times that people in key positions were like swapped every three months. Yeah, that's not really helping. So a loyal fluctuation to those people who are at the beginning in the project, they should be dedicated until the end of the project, if possible.
>
> PP3: At times, we have feedback like police held us on the road, we know who to talk to in the police to release them immediately.

In summary, Theme 5 is explained as: The practitioner's interaction with ITP process practices of timely response for the purpose of evading stumbling blocks and balancing conflicting needs positively impact successful outcome.

Overall, the answers from the research questions helped to identify the five themes described in this section. Research question one, which was *"How do project practitioners describe process management elements and process purpose in successful information technology projects?"* the participants explained about the ITP, identified element and behaviors in process management and the purposes they were addressed towards success. Respondents in answering the interview questions, pointed to the important elements such as communication, encouraging or enforcing the use of

methodology, and engagement with stakeholders. Research question two, *"How do project practitioners describe process management feedback mechanisms, including the interactions among project processes, in successful information technology projects?"* was focused on understanding the interaction between processes and how those were used from the perspective of feedback. Participants were mostly keen to discuss concepts such as the regular meetings, timely response and effective documentation. When asked questions linked to research question three *"what do project practitioners perceive as the best way to apply process management principles towards ensuring project survival, stability, and adaptability in information technology projects?"* the participants enumerated actions like promptly taking over or re-allocating activities to avoid a risk materialization.

Summary

Fourteen purposively selected participants responded to 12 semistructured interview questions which were designed around three research questions. Although there were three research questions supporting the main research question, the results were presented from the themes and categories view. This was because the research questions answered different related and interdepended aspects of the main research question, so the emergent theory was developed from the themes generated from the participants' responses to the three research questions. During data analysis, constant comparison of data with data, and data with codes provided the insight which led to the development of themes and categories. The themes and categories were guided by the conceptual theory, which was based on von Bertalanffy's (1972) general systems theory, and Ross Ashby's

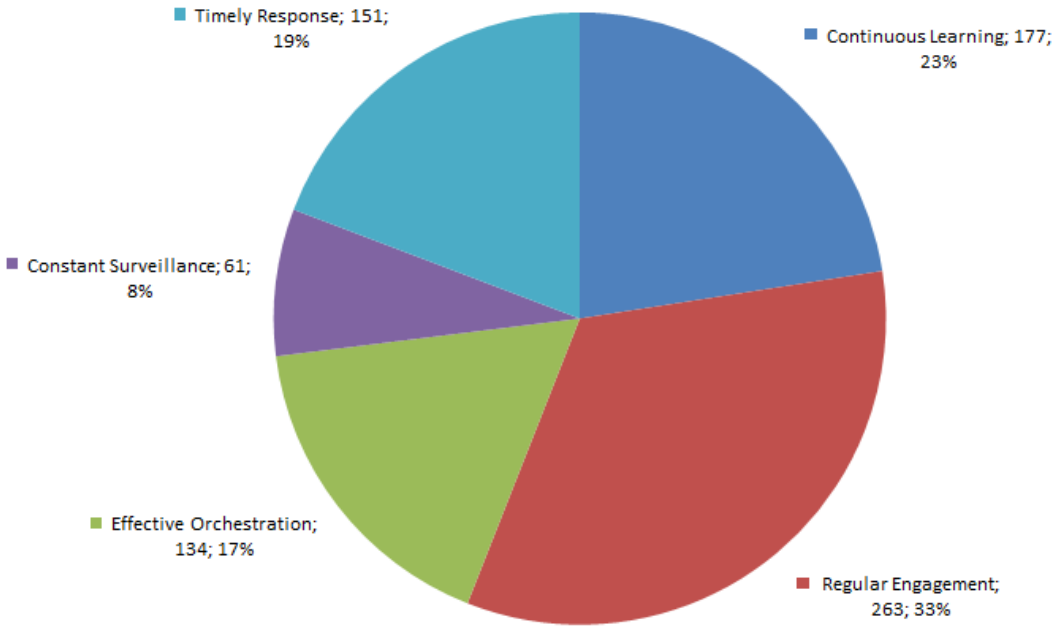
(1956) general theory of adaptive systems. The five themes were (a) Continuous Learning, (b) Regular Engagement, (c) Effective Orchestration, (d) Constant Surveillance, and (e) Timely Response. These themes are interrelated and highly depended, demonstrating how interconnected ITP processes were as described by the respondents. The discussions, conclusion, and recommendations from this study are presented in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

This qualitative study was carried out using a grounded theory methodology, with a focus on exploring processes management practices of ITP practitioners in a successful ITP (Glaser & Strauss, 2017). The research participants were purposively selected from ITP practitioners specifically with the role of ITP manager. An inductive approach was used to engage with the research participants through interviews, followed by data analysis to identify relevant project process management patterns, themes, and trends iteratively through constant data comparisons. The study was carried out using Charmaz's (2006) grounded theory technique, whereby the participants collaborate with the researcher to develop the theory. Charmaz's grounded theory research validation process was also followed. The sample size was not predetermined; rather, the data analysis conclusion was reached at the point of theoretical saturation (Charmaz, 2006; Tie et al., 2019). The purpose of this qualitative grounded theory study was to explore project process management practices of practitioners in successful ITPs and develop an emergent theory, which could describe how to best use project management processes in practice to achieve success. A project is viewed as a collection of complex social activities (Walker & Lloyd-Walker, 2016); hence, the systems theory, which is of social origin, was used in this research to enhance project management knowledge and unravel practical ITP management challenges (Floricel et al., 2014; Plokhov Dmitry et al., 2016). The findings from this study, as shown in Figure 4, are principles combining of social, behavioral and professional practices in successful ITP, expressed in five themes showing the numbers of references generated and their percentage distribution.

Figure 4

Generated Themes and Coding References Distribution



The finding from this study is summarized in five themes that identify guiding principles that project practitioners rely upon to achieve a successful outcome in ITPs. These themes are (a) continuous engagement, (b) effective orchestration, (c) continuous learning, (d) constant surveillance, and (e) timely response. As shown in Figure 4, from the data analysis, the themes regular engagement (33%), and continuous learning (23%) contributed mostly to ITP success with regards to the number of coding references, even though all the themes are interdependent.

Interpretation of Findings

The outcome of this study is an emergent ITP process management theory, which is parsimonious in nature. The focus of this research was to view process management in

an ITP as an open system and to understand how project practitioners managed the constituents or elements in the open system, towards achieving success. Project management best practices and concept are founded on the idea that certain project practices are identifiable, which could be generalized to make rules and guidelines such that if replicated by other practitioners the outcome could be similar irrespective of the environment (Tereso et al., 2019).

Extant literature exposed the relationship between project management practices and successful project outcome (Iriarte & Bayona, 2020). The relationships established in this study were guided by a conceptual framework designed around two systems theories: Ross Ashby's general theory of adaptive systems and Bertalanffy's open systems theory. The idea that *the whole is larger than the sum of the parts* behind systems theories has relevance in ITP management. In this study, a holistic view of ITP management in areas of process management as a whole, and not in parts, was established in the form of concepts and relationships between the concepts. In particular, ITP was seen through the lenses of an open system, and categories and concepts established. The open systems theory of von Bertalanffy metaphorically presents a model that consists of components that have a transparent flow of information, maintained at equilibrium, and sustained at a steady state even when the future systems state is different from the earlier state.

According to Caws (2015), within a system there exist functional relationships with independent elements that constitute it. Systems thinking maintains that the world is totally interrelated and all the parts are interacting intelligently and predictable in principle (Caws, 2015). The notion being that there may be multiple boundaries, but the

whole is still with a purpose or goal. The Ross Ashby's general theory of adaptive systems elucidated that a system's survival and stability necessitates the use of feedback mechanisms, which could be likened to a project team's motivation principles, with a project viewed as a system (Abyad, 2018; Umpleby, 2009). Systems that are self-organizing do not breakdown, rather they form other systems. A responsive process in a complex system demands spontaneous reflection on the systems interactions at the time it occurs (Large et al., 2015).

The World Economic Forum (as cited in Garel, 2013) report suggested three characteristics of resilience that are necessary for organizations to survive, namely, robustness, resourcefulness and redundancy; and two resilience performance attributes namely response and recovery. The findings from this study support the notion that ITP as an organization is managed through process practices identified as themes. The project manager or practitioner responsible for the project described guiding principles that helped the project to success by ensuring that the process management practices used in the execution of the project was effectively performed. These principles gave rise to the conclusion from this study in the form of an emergent theory of ITP process management.

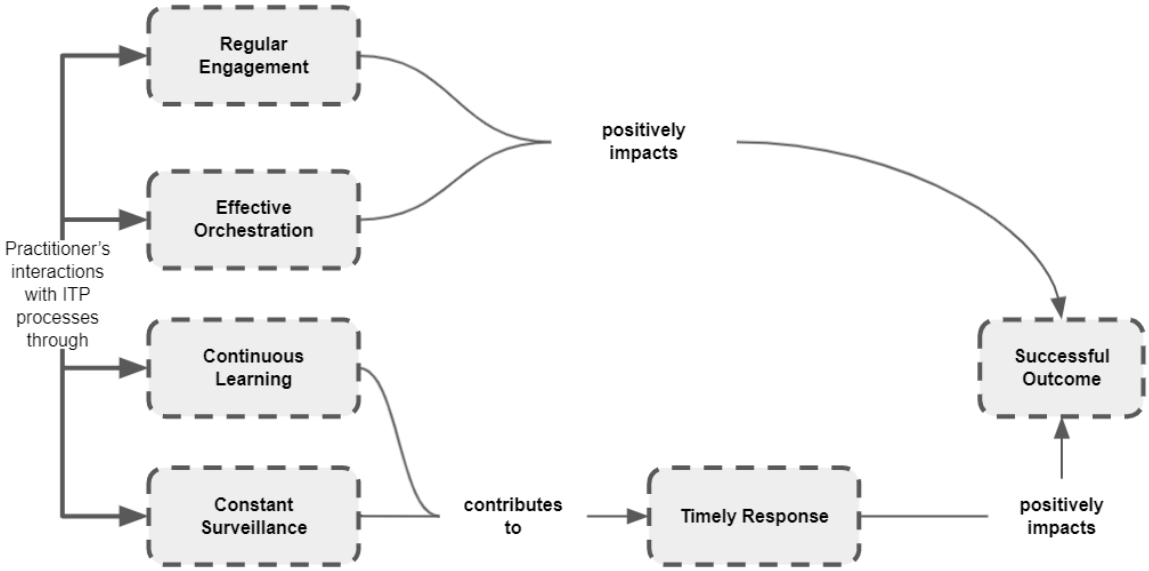
The Emergent Theory of Information Technology Project Process Management

The purpose of this qualitative grounded theory study was to explore project process management practices of practitioners in successful IT Projects and develop a theory describing how to best use project management processes in practice to achieve success. Through in-depth interviews of 14 participants, I identified what worked for the

practitioners who managed successful ITPs in practice, and described these from a process management perspective. Figure 3 represents the result of this study, which is the Emergent Theory of ITP Process Management, highlighting key concepts and their relationship as described by practitioners in their practices that make up the guiding principles that lead to a successful outcome of the ITPs they managed.

Figure 5

The Emergent Theory of Information Technology Project (ITP) Process Management



Note. This figure shows the relationship among practitioners' practices that make up the guiding principles of the theory. Created by J. O. Orazulike.

The emergent theory underscores that ITP practitioners' continuous learning and constant surveillance contributed to their timely response to events that led to successful ITP outcome; also, their regular stakeholder engagement and effective process orchestration positively impacted success. The emergent theory can be broken down into two principles based on the five identified themes and their relationships, namely, (a)

continuous learning, (b) regular engagement, (c) effective orchestration, (d) constant surveillance, and (e) timely response:

The Principle of Regular Engagement and Effective Orchestration in ITP Process Management

This principle relied on the themes (a) regular engagement, and (b) effective orchestration, to establish a possible relationship with successful outcome of an ITP and stated as:

> The Information Technology Project (ITP) practitioner's interactions while performing project processes through regular engagement and effective orchestration positively impacts successful outcome.

This principle could further be expanded to two statements. Firstly, the practice of regular engagement achieved through communicating with clarity supports in affiliating with teams and key stakeholders and establishing roles and responsibilities positively impacts successful outcome. Secondly, the practice of effective orchestration through sequencing and prioritizing activities, encouraging appropriate methodology, and efficient resources allocation positively impacts successful outcome.

PP5 aptly explained engagement using communication and orchestration using controlling "the controlling processes, as well as communication really, really helped in this case. Controlling in the sense that we were very watchful when it came to budget and time, it's one thing to say that we'll be able to finish this within this number of sprint's it's another thing to be able to actually do it." Alsulaimi and Abdullah's (2020) study supported the need to have an effective communication among ITP teams and

stakeholders in organizations, especially, paying particular attention to their differences to achieve the communication objectives. However, in this principle, engagement is described to go beyond communicating with clarity, to include affiliating with teams and key stakeholders, as well as establishing roles and responsibilities required for tasks execution. Communications helps the project manager to identify scope expectations, evaluate their feasibility and plan for them. Adam and Danaparamita's (2016) study supports this finding, where they found that there is a strong correlation between unrealistic expectation due to poorly managed scope and ITP failure. Similarly, Zhang & Jin (2020) found that obtaining accurate information regarding execution duration of project task is essential to achieving successful ITP.

The Principle of Continuous Learning, Constant Surveillance and Timely Response in ITP Process Management

This principle relied on the themes (a) continuous learning, (b) constant surveillance, and (c) timely response to establish a possible relationship with successful outcome of an ITP and stated as:

> The Information Technology Project (ITP) practitioner's interactions while performing project processes through continuous learning and constant surveillance contributes to timely response practices, which have positive impact on the ITP success.

This principle could further be expanded to three sub principles for clarity. Firstly, the practice of continuous learning, supported by documentation and regular review for the purpose of understanding what success means and understanding the environments and

requirements leads to commitment to achieve success which contributes to timely response. Secondly, the practitioner's interaction with ITP process practice of constant surveillance for the purpose of comparing expectations with outcomes and detecting feedback contributes to timely response. Thirdly, the practices of timely response for the purpose of evading stumbling blocks and balancing conflicting needs positively impact successful outcome.

As PP9 stated "we always have one thing that before we can start any project, you must have a kickoff meeting with the management or the stakeholders initially. So, in this case, we all came together, we discussed the outcome of the project, everybody discussed about the scope of the project, and then the outcome: this is what we want to achieve, we want to reduce cost, we want to know the objective of the project." Learning the requirement and environment, and surveillance to identify risks using feedback mechanisms and to response on time are the key words in this principle. Surveillance helps with retrospective reflection and visualizing the whole project as a system, and avoiding or eliminating risks that could become show-stoppers. Similarly, Hughes, Rana, and Simintiras (2017) found factors that led to project failure to include insufficient requirements management process, poor project planning and management practices, failure in risk management. Also, Jaber et al., (2016) found that visualizing project tasks and resources information helps in project integration management.

In this grounded study, I reviewed lived experiences narrated by participants about the most successful projects they managed and developed an emergent process management theory. Niederman et al. (2018) supported this approach, where they argued

that process theories help to bridge the gap between practice and theory, and advance knowledge in project management. The theory is intended to expose the tactics and techniques that featured most in driving ITPs to a successful outcome. The participants expressed a sense of euphoria and feeling of satisfaction while discussing the intrigues during the project execution. The fact that the discussion was specific about a particular successful project also improved the originality of the contents. In the context of the data analysis, I viewed the participants' statements using the conceptual framework as a lens focused on project survival, stability and adaptability. Project *survival* being the state in which the project was sustained and being executed such that it did not get cancelled or fail. Project *stability* being the state of the project whereby the project was executed as planned and alignment was established in all process interactions input and output. Project *adaptability* being the ability of the project to have remained resilient despite the events of shocks from external or internal that threated the projects survival.

The conceptual framework was drawn from the systems theories, focused on the concepts of a project being a collection of processes that interact, just like a systems, hence must possess qualities of a system to survive. At the point of conceptualizing the grounded study framework, the intention was to find out from the project practitioners what these elements were in ITP process management and how they harnessed them in practice. What was found was that they were five main components of these elements and their applications based on the conceptual framework of systems theory. These elements were thought to have worked together, and were observed to be consistently present in all samples during this study. While some elements were mentioned more often than others,

there was nonetheless no indication that the other elements were less important. In seeking survival, the system elements self-organize to adapt and stabilize.

Limitations of the Study

There were limitations in this study. The first limitation was that the sampling is limited to cycle: only project managers who were opportune to access the LinkedIn online platform on my network, or were contacted through referral or had access to the Walden Participants Pool volunteered to participate in the study. Consequently, only 14 volunteers participated, who were not representative of the general ITP project community possibly available, as full population was not within the control of the researcher (see Smith, 2015). The second limitation is that the participants discussed their experience to the extent that they could remember and they were subjective. There could have been other important practices in ITP process management that helped a project to be successful that participants may have forgotten about and therefore outside the control of the researcher to identify. The third limitation was that the nature of qualitative research is such that the researcher could bring in bias. This means that the outcome of this study is mostly driven by my interpretation of the participants responses, and there is a possibility that another researcher could reach a different concussion using the same methodology in this study. The fourth limitation is that the study was guided by systems theory and the outcome of this study could be different if the conceptual framework was based on a different theory. The fifth limitation is that the outcome of this study may not be generalizable due to the nature of qualitative study. A larger and more inclusive

sample size would have provided a better insight into ITP process practices but this was not feasible.

Recommendations

This study opened opportunities for further researchers, which will be presented as recommendation. First, the sample population was limited to possible participants within the researcher's network. There is an opportunity to conduct a similar research with a sample drawn from a wider population to bring in a wider view from different IT sectors or industries. Such a study could introduce industry or sector specific experiences that would have been missed in this study. In addition, including other stakeholders to contribute their experience in the discourse could add a new perspective in the ITP practices, as well as enable triangulation of data which will help in understanding the phenomenon. Secondly, it is recommended that other researcher perform this same study, and bring in their different interpretations, considering the qualitative nature of this study. The themes and categories generated may lead to refining the finding of this study.

Finally, the concepts of survival, stability and adaptability on conceptual framework established direct relationships to a successful ITP outcome in the conceptual framework. While the results from this study did not directly relate the survival, stability and adaptability concepts, further studies could be carried out to determine if there are direct relationships between ITP successful outcome and the three concepts.

Implications

In this study, the project process management practices of practitioners in successful ITPs were explored and emergent theory developed. The emergent theory

describes how to best use project management processes in practice to achieve success. There are implications resulting from this study which could have positive social change impact. Findings from this research could contribute to solving practice-based, theory or knowledge-based and social problems in society.

Practice-based challenges in project management could be evaluated with the principles derived from this study towards solving social problems in society. Practitioners seeking a workable approach to delivering ITP supporting healthcare or government projects to better the lives of individuals could find principles usable. Knowledge gaps in process management practices could be partly filled using the findings from this study regarding the emergent testable theory potentially minimizing ITP failure (see Hughes, Rana, & Simintiras, 2017). Specific contribution to the knowledge gap closure in ITP failure will be an improved understanding of what works to enable ITP success viewed through social theories (see Lehtinen et al., 2014; PMI, 2017). The findings could enhance ITPs' success rate and increase project funding by the World Bank in line with their priorities for Africa towards improved health and education (Ifc.org., 2018). Specifically, the findings could improve the success of ITP executed by governments targeted at poverty reduction and job creation in the society, enhance growth in a knowledge-driven economy, and contribute to positive social change, especially in developing countries.

Conclusions

The purpose of this qualitative grounded theory study was to explore project process management practices of practitioners in successful IT Projects and develop a

theory describing how to best use project management processes in practice to achieve success. The emergent theory showing the relationships between the project practitioners' best practices and successful ITP is defined using two principles based on the themes from this study: (a) The ITP practitioner's interactions while performing project processes through regular engagement and effective orchestration positively impacts successful outcome, and (b) the ITP practitioner's interactions while performing project processes through continuous learning and constant surveillance contributes to timely response practices, which have positive impact on the ITP success. The originality of this study is anchored on the fact that this study could contributes to understanding the principles that guide project managers in successfully delivering IT projects. These principles, hitherto, were not written down and often not decided ahead of starting any ITP, as narrated by participants. However, instinctively, practitioners through experience have developed these best practices, techniques and tactics as what worked best in the projects they managed. These principles are a combination of social, behavioral and professional practices in ITPs. It is important to note that this study supports other ITP management research that focuses on reducing project failures. In particular, this study found that ITP practitioners could focus on only five key process practices to achieve a successful project outcome: (a) continuous learning about the project, (b) effective process orchestration, (c) regular engagement with teams and stakeholders, (d) constant surveillance for threats, and (e) timely response to events in during projects lifecycle.

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Appendix A: Interview Questions with the Associated Research Questions

RQ1. How do project practitioners describe process management elements and process purpose in successful information technology projects?

1. Tell me about a project that you managed starting from initiation to its completion.
2. How would you describe the outcome of the project in terms of budget, scope and schedule, as well as the overall project benefit?
3. What project processes influenced the outcome of the project?
4. For the processes that influenced the outcome, what did you do or fail to do that had the most impact in the process purpose realization?
5. What practices and behaviors could you describe as mostly useful during the implementation of each process?

RQ2. How do project practitioners describe process management feedback mechanisms, including the interactions among project processes, in successful information technology projects?

1. How did you use feedback mechanisms, such as corrective and affirmative events to manage processes during project lifecycle?
2. In what ways did the outputs from one process into another process collectively affect the project during its lifecycle?
3. How did your handling of processes' input-output relationship influence your performance on the project's budget, scope, and schedule expectations?

RQ3. What do project practitioners perceive as the best way to apply process management principles towards ensuring project survival, stability, and adaptability in information technology projects?

1. How would you describe the overall survival, stability and adaptability of the project in the context of its environment?

2. What process management principles did you establish during the project lifecycle that guided the outcome of the project?
3. How did you use the process management principles in practice to influence the project in maintaining its trajectory during the projects life cycle?
4. What would you have done differently to get a better realization of the project's benefits, and scope completion within schedule and budget?