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ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

Assessment of Relative Application of Project Integration Management During Project Execution and Monitoring & Controlling Cycles: The Case of Kilinto Pharmaceutical Industrial Park

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July 2020

Addis Ababa

Addis Ababa University

College of Business and Economics

School of Commerce

Department of Project Management

Assessment of Relative Application of Project Integration Management During Project Execution and Monitoring & Controlling Cycles: The Case of Kilinto Pharmaceutical Industrial Park

Project Study Report Submitted in Partial Fulfillment of Requirement for Master of Arts Degree in Project Management Program

Prepared by: Mebrahtom G/yesus

Advisor: Mengistu B. (PhD)

July 2020

Addis Ababa, Ethiopia

ASSESSMENT OF RELATIVE APPLICATION OF PROJECT INTEGRATION MANAGEMENT DURING PROJECT EXECUTION AND MONITORING & CONTROLLING CYCLES: THE CASE OF KILINTO PHARMACEUTICAL INDUSTRIAL PARK

Addis Ababa University School of Commerce

Graduate Program

Board of Examiners Approval

This is to certify that the thesis entitled "Assessment of Relative Application of Project Integration Management During Project Execution and Monitoring & Controlling Cycles: the Case of Kilinto Pharmaceutical Industrial Park" is prepared by Mebrahtom G. in partial fulfillment of the requirements for the award of the degree of Master of Arts in Project Management, as per the regulation and procedures of the university and accepted standards with respect to originality and ethicality.

Approved by: Board of Examiners

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Statement of Certification

This is to certify that Mebrahtom G/yesus has carried out his project work on the topic entitled "Assessment of Relative Application of Project Integration Management During Project Execution and Monitoring & Controlling Cycles: the Case of Kilinto Pharmaceutical Industrial Park" under my guidance and supervision. Accordingly, I hereby assure that his work is appropriate and standard enough to be submitted for the award of Master of Arts Degree in Project Management.

_____

Advisor: Mengistu B. (PhD)

July 2020

Addis Ababa, Ethiopia

DECLARATION

I, Mebrahtom G/yesus, hereby assert that the project work entitled " **ASSESSMENT OF RELATIVE APPLICATION OF PROJECT INTEGRATION MANAGEMENT DURING PROJECT EXECUTION AND MONITORING & CONTROLLING CYCLES: the Case of Kilinto Pharmaceutical Industrial Park**" submitted to Addis Ababa University, College of Business and Economics, School of Commerce, Department of Project Management, is an original work done by me under the guidance of Mr. Mengistu B. (PhD).

This project work is submitted in partial fulfillment of the requirements for award of master's degree in "Project Management". To the level of due-diligence I have done, the results embodied in this thesis have not been submitted to any other academic entity for the award of any degree or diploma.

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July 2020

Addis Ababa, Ethiopia

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List of Acronyms

IPDC-Industrial Parks' Development Corporation

PMI-Project Management Institute

PMBoK-Project Management Body of Knowledge

IPs-Industrial Parks

IP-Industrial Park

KAs-Knowledge Areas

KA-Knowledge Area

PIM-Project Integration Management

M and C-Monitoring and Controlling

PM-Project Manger

SPSS-Statistical Package for Social Sciences

APM- Association for Project Management

IPMA- International Project Management Association

KPIP-Kilinto Pharmaceutical Industrial Park

Abstract

Project Integration Management is the only knowledge are, among the ten identified by the project management institute, that focuses on smoothing of the overall project processes and checking the level of agreement between all the other knowledge areas, project processes and deliverables. It is indeed the only area that has processes in all the project lifecycles. Most of its processes are mapped to be in the project execution and project monitoring and controlling cycles. The project study focuses on assessing relative application of project integration management during project execution and project monitoring and controlling life cycles from project team perspectives. The project study is conducted taking a real case application area in one of the public industrial projects, Kilinto Pharmaceutical Industrial Park through employing census sampling due to limited number of project participants. Having collected both primary and secondary data, the study employed a mixed research approach and used the Statistical Package for Social Sciences (SPSS) for data analysis. A very good reliability test is observed on the collected data. Factors with Eigenvalue of 1 and more extracted applying 0.5 factor loading. It is basically observed that project integration management is perceived as the most important area in delivering a successful project overall and applied accordingly. There are few occasions during the project lifecycle where integration management is thought to have less significance than other knowledge areas like project scope management and project risk management. In addition, it is specifically identified in the results that two components, components having 11 extracted items (factors) represent most of the variance explained. As a result, it is concluded, the project implementing team should focus mainly on the two components in times of priority and then on the other two components which explains lower proportion of the variance having seven extracted items. Depending solely on findings of the project study, recommendations are forwarded both to the project organization and the project team. Potential Future Research areas of the project lifecycles, integration management in all project phases and assessing project integration management impact are forwarded.

Key Words: Project Management, Project Integration Management, Knowledge Areas,

Industrial Parks, Project Execution, Project Monitoring and Controlling

Chapter One: Introduction

1.1. Background of the Study

The Project Management Institute (PMI, 2017) defines Project Integration Management as " a task that include processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management". In addition, Rashad and Tshepo (2011) indicate that project management and project integration management are very important roles in project success.

Latest edition of the guide on project management body of knowledge (PMBoK) publication by PMI articulates how project processes are categorized by Knowledge Areas in addition to process groups. A Knowledge Area, in this regard, is defined as an identified area of project management delineated by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. Although the Knowledge Areas identified by PMI are interrelated, they are demarcated separately from the project management perspective. (PMI, 2017). ILIEȘT et al (2010) defined Project Management Body of Knowledge as a collection of processes and knowledge areas generally accepted as best practice within the project management discipline. They also stated it as an internationally recognized standard that provides the fundamentals of project management as they apply to a wide range of projects.

The central focus of this project report is in one the ten project management knowledge areas identified by PMI, which is project integration management. In the project management context, integration includes characteristics of unification, consolidation, communication, and interrelationship (PMI, 2017).

Hadi et al (2017) stated that Project Integration Management area is aimed at fusing all the other knowledge areas into a comprehensive set of working tools and techniques that help Project Managers achieve the goals of their projects successfully. It is also evident from the latest guide on project management of PMI that the knowledge area is the only area having an application in all the project management life cycles followed by project stakeholders management having process group in four of the process groups.

Different Literature may term lifecycle of projects differently. Based on PMI definition, project life cycle is managed by executing a series of project management activities known as project management processes through which one or more outputs are produced from one or more inputs by using appropriate project management tools and techniques. In some case, some of the cycles are merged and termed differently. Jeffry (2016), for instance, stated project life cycle refers to the stages in a project's development and life cycles are important because they demonstrate the logic that governs a project. It is also stated by the author that they help us develop our plans for carrying out the project. The life cycles are divided into four distinct phases namely: conceptualization, planning, execution, and termination. Basic activities and tasks remain similar, however. For purpose of consistency, the PMI classification of project phases and related process groups are considered for purpose of this project report.

1.2. Statement of problem

Hadi et al (2017) claimed that despite there were plenty of research that studied project management knowledge areas separately, there was no evidence of a past study that combined the knowledge areas identified by the PMI. Based on this assumption, they have used literature to define each knowledge area and grouped them be tested in line to their integration. In addition, Henry (2014) noted that project integration management would be a logical location to address organizational change management issues since it drives project scope, schedule, cost, quality, risk, and procurement.

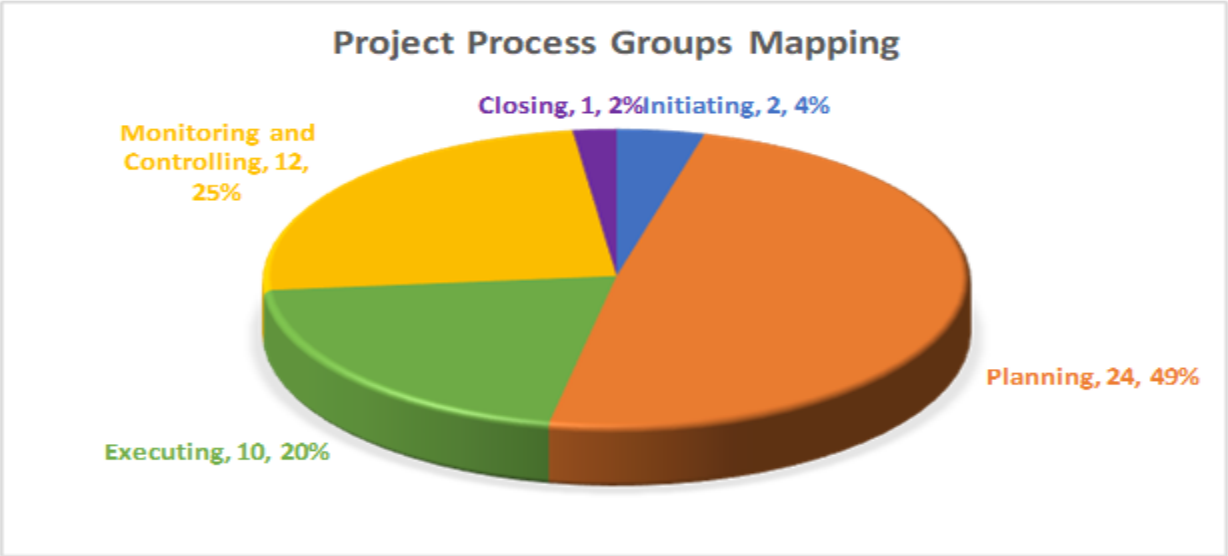
Ineffective integration of project management with enterprise operational processes prevents synergistic effects and causes resource waste and reduced operational efficiency. These failures are deemed to increase enterprise burdens and have prevented companies from enhancing their competitiveness. (Jui-Sheng Chou, 2012). It is identified during early engagement of the project team that the project in the study had a good project plan in the start and implementation started accordingly. Despite the project was planned to host multi sector investors, sector specialization is changed to pharmaceutical manufacturing which is assumed to create a big deal of integration challenge. To this end, the main point raised by the team is absence of solid understanding is s a challenge for the project execution. The project work recognizes the role project integration management in such potential failure and tries to relate its perceived application value during execution and monitoring and controlling phases of the project.

Value of Project integration management is supposed to be much beyond the project planning and execution phases and even beyond the project itself. Rodney (2007) conferred Strategic Decision Management is the program management equivalent of the Integration Management knowledge area in project management and should be a cyclic, benefits-oriented process capable of dealing with emergent inputs and continually evolving circumstances.

It is indicated by PMI (2017) that Project Integration management has process group in all the project management phases. Not only this, it is also with most number of process groups as "project risk management". By providing a practical and theoretical investigation on the area, the project is expected to bring a great value for project management professionals by identifying and investigating the relative application value of project integration management during the project execution and project monitoring and controlling phases.

The project study is conducted in Kilinto Pharmaceutical Industrial Park by focusing on two of the project management lifecycles, Project Execution and project monitoring and controlling. These lifecycles are thought to have most of the application area since they take over four (4) of the seven (7) total processes identified for the knowledge area in general. This represents about 57%. In addition, one of the processes is employed at early stage o\f the project "through developing project charter" on initiation group and one is employed after many of the deliverables are developed through "close project or phase" on closure group. It is assumed most activities of project integration are followed in the middle stages, therefore. Of the total five processes in this middle stage, four are located to be in execution and monitoring and controlling process groups. In addition, the project inconsideration has passed its planning phase and the major underway activities are execution and monitoring and controlling. As a result, The project study mainly focuses on these two process groups. The main aim of this report is investigating the perceived application of project integration management relative to other knowledge areas during the project executing and project monitoring and controlling process groups.

Figure 1.1. Project Life Cycles and Processes Proportion



We can see from figure 1.1 above that, most processes are located in planning process group and the least is in closing process group. Project integration management is the only knowledge area that has application in all process groups, and it is the only area that has process during the closure process group. The chart depicted above shows proportion of project management processes during the five process groups. It can be grasped that about 96% are mapped to be in Project planning, monitoring and controlling and executing. These constitutes 46 of the total 49 processes identified by PMI (2017).

The central focus of this project report is therefore assessing the practical, rather than conceptual, relative application of project integration management on the two major application processes of the knowledge area, Executing and Monitoring and Controlling. The major assumption here is that factors that can make "project integration management" more applicable in these two processes could also make it in other life cycles of the project. The aim of the report is finding a practical evidence on relative application of project integration taking one of highest national priority projects, Kilinto Pharmaceutical Industrial Park (KiIP), as a case.

1.3. Research Project Objectives

As many other research projects, the project study has both general and specific objectives that it aimed to achieve. By reviewing related literatures, collecting relevant necessary primary and

secondary data, analyzing the data, deducting general findings, and forwarding recommendations, the following objective are supposed to be achieved at the end of the research.

1.3.1. General objective:

The general objective of the study is investigating the relative perceived value and application of project integration management during two of the project management process groups, i.e project execution and project monitoring and controlling. Reaching at finding on the perceived value of integration management in comparison to other knowledge areas and recommending better resource investment on the project is the major of objective study, therefore.

1.3.2. Specific objectives:

The general objective can be broken down and result in some specific objectives. Beneath, the grand aim identified for the intervention, the following are presumed specific objectives the research paper envisioned to realize.

- Assessing the general perceived application of project integration management relative to other knowledge areas for a project success in KPIP.
- Assessing the relative importance of project integration management during project execution in KPIP.
- Reviewing relative importance of project integration management during project controlling in KPIP

1.4. Research Questions

In line to the project objectives envisioned, research questions to be answered through the data collection, response analysis and related findings are developed. All the research questions capture the general and specific research objectives forwarded above. The research questions, with this manner, are:

1) How does the project team perceive the relative importance of project integration management during project execution in KPIP?

2) How does the project team perceive the relative importance of project integration management during monitoring and control in KPIP?

3) What make project integration management more valuable during the five project management processes in KPIP?

1.5. Significance of the study

Like many other interventions, this project report is assumed to have its own significance in different perspectives. Having answered the research question, the project study is expected to have the following significances.

- **Supplementing to Body of knowledge:** Hadi et al (2017) stated there were plenty researches conducted on the separate knowledge areas of project management, but not much on the integration part of all these knowledge areas. This project study will have an important contribution on supplementing the existing body of knowledge, therefore.
- **Assisting Project Team**: The report will support management decision, especially with regard to resource allocation. With assessment on the relative value of project integration management and its application, the study could improve the awareness of project team toward the body of knowledge.
- **Identifying perceived value of project integration management**: Project integration management lies at the center of the knowledge areas. It is indeed one of the areas where project managers are highly engaged related managing deliverables of the project, on which the ultimate objectives of the project depend. By taking a practical investigation on perception of project team toward integration management while leading the project, the report tries to map integration in its importance. This in turn could help the daily activities and interaction of the project team which in turn could help to plan how much effort should be invested in what activities.
- **Reference:** in addition to the above significances, the study will serve as literature and reference for practitioners and students in the project management. Since the profession is relatively new in general and very new to our country, it is believed the project report will have an important value too be used in future related interventions.

1.6. *Project Study Scope*

As indicated by the title and the research objectives, major focus of the project is on assessing the perceived value of one of the ten project management knowledge areas identified by PMI, Project Integration Management. Project Integration is compared based on its perceived value for project success while implementing the project relative to the other nine knowledge areas to this end.

Since most of the project integration management application areas are on two of the project lifecycles, which are executing and monitoring and controlling, these cycles are considered for data collection purpose of this project. Not much emphasis is given on the other cycles [initiating, planning and closure]. The reason is first there is not much execution process during the earlier life cycles of the project. And most of the process groups falls in the two process, as highlighted in earlier sections. The following figure shows the application of integration in a project based on PMI publication.

Table 1.1. Project Scope

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase

Source: PMI Processes mapping

The above table depicts scope of the project. The earlier two and the last process groups are not considered for data collection survey on this project. The highlighted area is assumed to be boundary of the intervention and related findings. Due to the evident higher interrelation of the process groups, literature review and Review of literature comprise interview questions considered all the processes groups, however.

1.7. *Limitations of the project* **Study**

The project study is coupled with some limitation during the intervention time. The most common attributed limitations are the following:

- **Sample frame and samples related limitations:** The employed approach is a case study of Kilinto Industrial Park. Only one case [project] is considered and this limited sample frame from which samples are selected. As it is a project report, a purposive sample is employed with most sample being respondents which are presumed to be familiar with the selected project. This could have its own effect on generalizability of findings and external validity as a result.

- **Data analysis related:** The other major potential limitation is regarding the data analysis employed. Statistical Package for Social Science (SPSS) is employed in the data analysis of questionnaire [survey] responses. The package is ideal for large sets of data. Due to the sampling nature of the project and limited sample frame size, the sample size selected is not vast. Detail hypothesis testing and regression analysis are not employed as they are not assumed ideal with regard to the type of data needed for the study. Interview is conducted as way of data triangulation.

1.8. Organization of the Project Report

The research project contains many issues and concepts throughout the study. Beginning with the introduction in chapter one, the project report has five major chapters. The introduction includes the core points of the background of the study, statement of the problem, research questions, research objectives, significance of the study, limitations of the study, scope of the study, and organizations of the study.

Chapter two incorporates the literature review. This chapter reviewed and discussed concepts, theoretical backgrounds, practical implication, empirical studies and related published and unpublished materials of the project area. Previously conducted studies, books and articles are reviewed in this chapter. This details relevant academic, theoretical, and empirical sources. Chapter three outlined the research methodologies followed in conducting the project. The research design, the philosophical worldview, the strategies of inquiries, the population and size, the data needed for the study and for each research question, methods and the data analysis

methods applied are all incorporated in this chapter. Chapter four of the study comprised presentation and analysis of the data collected and the discussions there up on. This included all the qualitative and quantitative results of the findings. In the final chapter (chapter five), conclusions based on the findings are inferred and recommendations are forwarded. All reference materials utilized in the project study are summarized at last.

Chapter Two: Literature Review

This chapter captures review of the related literature on the project. Reviewing the literature is employed starting from the earlier proposal development of the project and continues to develop this theoretical/conceptual review and empirical studies. The theoretical review is assessed on the first part of the chapter and it emphasizes on the major conceptual framework of project, project management, project knowledge areas, project integration management and related aspects. The first part that concentrate on the empirical assessment is mainly related some actual researches done on the conceptual frameworks in general and project integration management in particular.

Kothari (2004) stipulated that researcher must examine all available literature to get acquainted with the selected problem. In doing so two types of literature are forwarded—the conceptual literature concerning the concepts and theories, and the empirical literature consisting of studies made earlier which are similar to the one proposed. The basic outcome of this review is believed to be knowledge as to what data and other materials are available for operational purposes which could enable the researcher to specify research problem in a meaningful context In line to this, major subject matters of the project are reviewed as the follows.

2.1. Theoretical Reviews

2.1.1. Project life cycles Vs Project management process groups

2.1.1.1. Project life cycles

According to PMI (2017), a project life cycle is the series of phases that a project passes through from its start to its completion and provides basic framework for managing the project which can applied regardless of the specific project work involved. Within a project life cycle, it is proclaimed by the institute that there are generally one or more phases called development life cycle, that are associated with the development of the product, service, or result. Development life cycles, with this regard, can be:

- Predictive Life cycle: In a predictive life cycle, the project scope, time, and cost are determined in the early phases of the life cycle. Any changes to the scope are carefully managed. Predictive life cycles may also be referred to as waterfall life cycles.

- Iterative life cycle: here, the project scope is generally determined early in the project life cycle, but time and cost estimates are routinely modified as the project team's understanding of the product increases. Iterations develop the product through a series of repeated cycles, while increments successively add to the functionality of the product.
- Incremental life cycle: In an incremental life cycle, the deliverable is produced through a series of iterations that successively add functionality within a predetermined time frame. The deliverable contains the necessary and sufficient capability to be considered complete only after the final iteration.
- Adaptive life cycles: These are agile, iterative, or incremental. The detailed scope is defined and approved before the start of an iteration. Adaptive life cycles are also referred to as agile or change-driven life cycles.
- Hybrid life cycle: A hybrid life cycle is a combination of a predictive and an adaptive life cycle. Those elements of the project that are well known or have fixed requirements follow a predictive development life cycle, and those elements that are still evolving follow an adaptive development life cycle.

Determine the best life cycle for each project is left to be decided by the project management team while the project life cycle is suggested to be flexible enough to deal with the variety of factors included in the project. (PMI,2017)

Various variation could exist on the form and type life cycles on the literature. For instance, The Results-Based Management or RBM of UNDB considers the lifecycle as an interacting feature of planning, monitoring and evaluation. These in turn has interconnected tasks of: Setting the vision, Defining the results map and RBM framework, planning for monitoring and evaluation, Implementing, and using monitoring and Managing and using evaluation; Stakeholder Participation being at the center of all.

Jeffrey (2016), defined project life cycle as referring to stages in a project's development that are important because they demonstrate the logic that governs a project. He more claimed they help in developing plans for carrying out the project. The project life cycle in this regard, is believed to be useful mean of visualizing the activities required and challenges to be faced during the life

of a project. Considering a simplified model considered by Jeffery, the project life cycle is divided in four distinct phases as follows.

- **Conceptualization:** refers to the development of the initial goal and technical specifications for a project. In this cycle, the scope of the work is determined, necessary resources (people, money, physical plant) identified, and important organizational contributors or stakeholders signed on.
- **Planning:** is the stage in which all detailed specifications, schematics, schedules, and other plans are developed. The individual pieces of the project, often called work packages, are broken down, individual assignments made, and the process for completion clearly delineated.
- **Execution:** During execution, the actual "work" of the project is performed, the system developed, or the product created and fabricated. It is during the execution phase that the bulk of project team labor is performed.
- **Termination:** occurs when the completed project is transferred to the customer, its resources reassigned, and the project formally closed out. As specific sub activities are completed, the project shrinks in scope and costs decline rapidly.

The author also pointed out that the stages are the waypoints at which the project team can evaluate both its performance and the project's overall status.

Moreover, Paul (2016) claimed all projects have an identifiable life cycle, the characteristics of which could vary according to the size and complexity of the project and other peculiarities. Accordingly, all projects are thought to be mapped to the following simple life cycle structure:

i. Starting the project
ii. Organizing and preparing
iii. Carrying out the work
iv. Closing the project

Paul (2016) extended this to the following four-phase life cycle the phases being referred as: Initiation, Planning, Execution and Closure. He emphasized that looking at a project in this way can help understand what it is that makes a project different from a business process, but it can

also lead to confusion because it represents a gross over-simplification of what happens in most projects. Care is needed while interpreting and applying the life cycles, therefore. After all, the type and complexity of the project would play an important role in considering which model to utilize.

Paul (2016) identified phases that can be seen as process groups based on PMI guide. These phases are summarized as follows:

- **Project Initiation Processes:** The initiation processes are supposed to start the project but appear to be part of the very thing they are attempting to start. The most important thing to remember about the initiation process is assumed to be that it does NOT involve starting work on creating any of the 'products' of the project but exclusively related with clarifying the project's objectives and the needs to achieve them.

- **Project Planning Processes:** planning is an activity that continues almost to the very end if the project. Change is eminent as the project progresses. A misconception is done assuming that the planning phase must be completed before the actual work of the project can begin while in fact can be a serious mistake to spend too much time on planning in the early stages of the project as this not only wastes time but can give everyone involved a false impression of how much is really at the stage. The main purpose planning phase is believed to be to plan time, cost, and resources adequately to estimate the work needed and to effectively manage risk.

- **Project Executing Processes**: The whole point of a project is to produce deliverables of some sort and the execution phase is where this happens. Work is done according to the project plan and that work is monitored and the results fed back to the people responsible for the plan so that it can be updated to reflect the progress achieved so far.

- **Project Monitoring & Controlling Processes:** is a task where results of the executing processes are compared against the plan and where differences exist, corrective action is taken either to change the plan itself or the way in which the plan is being executed.

- **Project Change Control Processes**: This is the process of reviewing all change requests, approving changes and managing changes to the deliverables, project documents and the project plan. It is conducted from project initiation through completion
- **Project Closure Processes:** represents the formal completion of the project deliverables and their transfer to the final beneficiaries – usually internal or external customers. This phase also deemed to include 'administrative closure,' which is the termination of the activities of the project team, the completion of all project documentation, and a formal sign-off of any contracts. (Paul, 2016, pp: 12-49)

Moreover, on their study of Project complexity and systems integration, Andrew and Ian (2012) indicated there are different phases of integration that can be managed during the life of the program including design, construction and operational handover. Digital technologies and software tools were established to coordinate each phase of integration. We can see from the above discussion on various sources that there is much similarity in the function performed during the project life cycles despite there is mini difference in the terms and in modeling. This is good indicator that there is no hard and fast rule that can determine type of a project life cycle to be sued but rather type of the project, resources available, complexity of the project and its environment along with many other factors could affect choice of the model, if indeed choosing is needed.

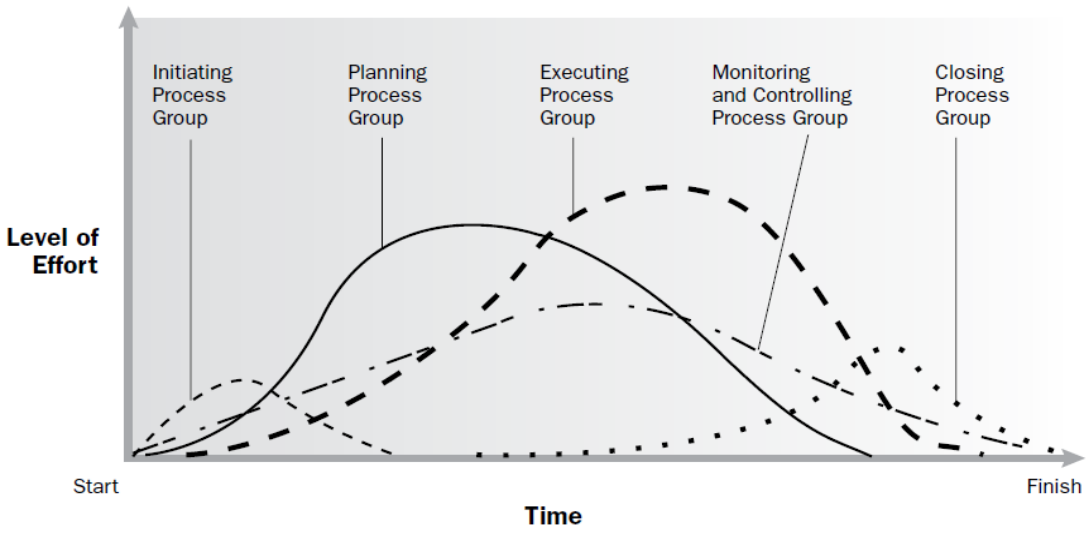
2.1.1.2. Project Management Process Groups

PMI (2017) declares PM process groups as being logical grouping of project management inputs, tools and techniques, and outputs. It is highlighted as well that the Process Groups are not project phases. Project Phases are understood to be collection of logically related project activities that culminates in the completion of one or more deliverables.

Claude et al (2006) stated that the process groups of initiating, planning, executing, and closing have names and definitions that are very close to those used to identify project phases. However, PMI clearly states process groups are not project phases. If the project is divided into phases, the processes in the process groups interact within each phase. It is found possible by PMI that all Process Groups could be represented within a phase. As projects are separated into distinct phases, such as concept development, feasibility study, design, prototype, build, or test, etc.,

processes in each of the Process Groups are repeated as necessary in each phase until the completion criteria for that phase have been satisfied. PMI further provides the following figure to strengthen this idea strengthen this idea.

Figure 2.1: PM Process Group Interactions Within a Project or Phase



Source: PMI, 2017

PMI standard also stipulates project management processes are employed to meet project objectives as highlighted above in figure 2.1.

2.1.2. Project Management Knowledge Areas

2.1.2.1. Project Scope Management

Jeffrey (2016) stated Project scope management is the detailed development of the project plan to specify the work content and outcomes of the project, the activities that must be performed, the resources consumed, and the quality standards to be maintained. The goal of scope management, with this regard, is maximum efficiency through the formation and execution of plans or systems that leave as little as possible to chance.

Moreover, Asadullah (2006) stated it Managing the scope of a project is considered to be the most important function of a project manager despite a project could be in any sphere of industrial or nonindustrial activity, manufacturing or service environment, private or public

enterprise, government or non-government undertaking. In this manner, effective scope management of a project also ensures the successful management of other key project management areas, including time, cost, and quality. Asadullah clarified this includes the activities of project initiation, scope planning, scope definition, scope verification, and scope change control.

Detail planning activities are done here. Some of the significant planning tasks dealt in this. In doing, various models and diagrams can be utilized, for instance the Requirements Trackability Matrix. The six steps in creating a project scope management procedure according to Jeffrey (2016) are conceptual development, the scope statement, work authorization, scope reporting, control systems, and project closeout.

2.1.2.2. Project Schedule Management

Project Schedule Management includes the processes required to manage the timely completion of the project. The processes identified for this KA by PMI (2017) are:

- Plan Schedule Management—The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.
- Define Activities—The process of identifying and documenting the specific actions to be performed to produce the project deliverables.
- Sequence Activities—The process of identifying and documenting relationships among the project activities.
- Estimate Activity Durations—The process of estimating the number of work periods needed to complete individual activities with the estimated resources.
- Develop Schedule—The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model for project execution and monitoring and controlling.
- Control Schedule—The process of monitoring the status of the project to update the project schedule and manage changes to the schedule baseline.

In some literatures, this knowledge area is referred as “Project Time Management”. Jeffrey (2016) for instance defined, Project Time Management is a knowledge area he processes required to manage the timely completion of a project. Project scheduling provides a detailed plan that represents how and when the project will deliver the products, services, and results defined in the project scope and serves as a tool for communication, managing stakeholders’ expectations, and as a basis for performance reporting. When possible, it is suggested to keep the detailed project schedule flexible throughout the project to adjust for knowledge gained, increased understanding of the risk, and value-added activities. (PMI, 2017)

2.1.2.3. Project Cost Management

This is the KA where the financial plan of the project is managed and administered. PMI (2017) KA guides provide the Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget. One of the important the important modes employed on project cost management is Earned Value System. Walt (2008) stated Earned value management (EVM) is a method of project management, which facilitates project control and provides support in forecasting final cost. In addition, David (2001) indicated that cost performance of building construction projects is a key success criterion for project sponsors and key component of a project budget is cost contingency. The research also indicated that ack of sophistication in the estimation of project cost contingency by practitioners is reinforced by poor management practices in term of reviewing the accuracy of contingency and the limited existence of policy and good management practices.

Jeffrey (2016) indicated Project Cost Management as a Knowledge Area and its process involved in estimating, budgeting, and controlling costs so that the project can be completed within the approved budget.

2.1.2.4. Project Quality Management

Project Quality Management is the knowledge area that includes processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken. (Jeffrey, 2016) In addition, PMI (2017) states this KA includes the processes for incorporating the organization’s quality policy

regarding planning, managing, and controlling project and product quality requirements in order to meet stakeholders' objectives.

Likewise, on a study of an integrated view of project and quality management for project-based organizations Linda (200) conclude, an imaginary line between projects and operations is reinforced by the different techniques used to instill quality in the work undertaken and projects tend to use qualitative approaches such as benchmarking and flowcharting, where operations use quantitative and data intensive approaches such as statistical process control. Fundamentally, both disciplines are deeded to be supported by the same principles of customer focus, teamwork, and continuous improvement. It is included on the study therefore that both for a project-based organizations' formal project management is quality management.

2.1.2.5. Project Resource Management

While studying the Resource Management in Construction projects, Fadi (1986) indicated the allocation of resources of different types to a construction project is a difficult managerial problem, particularly when construction equipment has to be shared among a number of project sites. Timing adequately the use of different pieces of equipment on a given project is an important cost control issue, since an inadequate allocation and scheduling of resources can lead to equipment idleness and consequently higher costs of leased equipment, due to the inefficient use of both leased and owned equipment.

It is pointed out by PMI (2017) as well that Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project. These processes help ensure that the right resources will be available to the project manager and project team at the right time and place.

2.1.2.6. Project Communications Management

Robbins and Judge (2013) defined communication simply as the transfer and understanding of meaning. Communication has multi role in organization and in project. It is indeed among the many important aspects of interpersonal skills. Robbins and Judge stated the effective manager spends more time communication that doing other tasks. And according to PMI, (2017) Project Communications Management includes the processes necessary to ensure that the information

needs of the project and its stakeholders are met through development of artifacts and implementation of activities designed to achieve effective information exchange.

On their action-based qualitative case study research, Aurangzeab (2016) showed This large project required planned communication routines for all the key stakeholders and the communication requirements had to be written down in the contractual agreement due to the complex setup In addition, it is concluded that if the project leader changes, it affects the communication culture and the stakeholder engagement in the change management process and consideration project stakeholders' know-how shall lead to the communication effectiveness during the evolving project cultures.

2.1.2.7. Project Risk Management

Ofer and Mark (2011) stated the global business environment involves high levels of risk and complexity, which is a necessary condition for future growth and development. To this end, risk management is assumed to be particularly important in the project management area, as this discipline involves many organizational functions and their related risks. The authors also provided, projects usually possess high levels of uncertainty derived from their compressed schedules, inadequate or uncertain budgets, designs that are near the feasible limit of achievable performance, and frequently changing requirements.

Chapman and Ward (2003) stated risk involves both threat and opportunity and all projects involve risk—the zero-risk project is not worth pursuing. This indicated risk and uncertainty are an integral part of the project management. Based on PMI (201), Project Risk Management is assumed to include processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. The objectives of project risk management, to this end, are to increase the probability and/or impact of positive risks and to decrease the probability and/or impact of negative risks, in order to optimize the chances of project success.

2.1.2.8. Project Procurement Management

Project Procurement Management is defined by Jeffrey (2016) as a knowledge area comprising processes to purchase or acquire the products, services, or results needed from outside the project team to perform the work. According to PMI, Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team. Project Procurement Management includes the management and control processes required to develop and administer agreements such as contracts, purchase orders, memoranda of agreements (MOAs), or internal service level agreements (SLAs).

2.1.2.9. Project Stakeholder Management

Pernille (2015) remarked it that understanding stakeholder dynamics and their impact on project management is extremely important in order to evaluate the viability of large and complex projects. It is identified on the study that flexible and open siting process ensured that the opposing stakeholders were identified in the early stage of the project, giving project management enough time to engage with these stakeholders and to shape the social and political context of the project into a more beneficial direction. It is noted with regard that it is also important for project managers to carefully evaluate the capability of different stakeholders to shape their salience attributes through stakeholder influence strategies (Aaltonen et al., 2008) as well as the probability of the project becoming a platform for advancing political aspirations.

Moreover, Jeffrey (2016) defined Project stakeholders “as all individuals or groups who have an active stake in the project and can potentially impact, either positively or negatively, its development. Project stakeholder analysis, then, consists of formulating strategies to identify and, if necessary, manage for positive results the impact of stakeholders on the project”. Jeffrey also indicated Stakeholder analysis is helpful since it compels firms to acknowledge the potentially wide-ranging effects, both intended and unintended, that their actions can have on various stakeholder groups Just as stakeholder analysis is instructive for understanding the impact of major strategic decisions, project stakeholder analysis is extremely important when it comes to managing projects. The project development process itself can be directly affected by stakeholders.

2.1.3. *Project Integration Management*

It is highlighted in the above sections that the project integration management is one of the important activities the project team is engaged in. Being one of the ten PM knowledge areas (PMI, 2017), it is distinct because the integration focuses on levelling flow of tasks of all the other knowledge areas, processes, and activities for the project.

According to PMI guide, Project Integration Management is the knowledge area that includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups. In the project management context, integration includes characteristics of unification, consolidation, communication, and interrelationship. As cited by Rashad and Tshepo (2011), Merrill (2007) stated it that project integration management and project management are very important roles in every project success. It is indicated on the study that these two include the role of skilled project managers working together with stakeholders as well as project team to ensure that projects objectives are met. Based on their study, the integration management is believed to ensure all project elements that are necessary to complete a successful project come together.

This section discusses more theoretical and conceptual background of the main theme of the project, project integration management. Despite it has been highlighted in the previous discussion, it is found relevant to give more discussion as being focus area of the project report. More discussions which are not reviewed in previous discussion are explained below.

2.1.3.1. Conceptual Framework of Project Integration Management

Integration is not only about ongoing activities. Termination by integration is among three types of project terminations. Jeffrey (2016) states integration represents a common, but exceedingly complicated, method for dealing with successful projects. The project's resources, including the project team, are reintegrated within the organization's existing structure following the conclusion of the project.

Adrienne (2016) outlined projects have all types of activities going on and there is a need to keep the "whole" thing moving collectively – integrating all the dynamics that take place. Managing

integration is about developing the project charter, scope statement, and plan to direct, manage, monitor, and control project change.

U.S. Department of the Interior Bureau of Reclamation (2012) indicated Project Integration Management includes the processes and activities needed to identify, define, combine, unify, and coordinate the various technical and project management activities within the project management life cycle. In the project management context, integration includes characteristics of unification, consolidation, articulation, and integrative actions that are crucial to project completion, successfully managing stakeholder expectations, and meeting requirements.

Integration is a critical skill for project managers. There are some key distinctive features that make project integration management center of the overall project management. The following are some of among these feature and key concepts of the knowledge areas as described in 6th edition of the PMI guide.

- Project Integration Management is the specific responsibility of the project manager and it cannot be delegated or transferred. The project manager is the one that combines the results from all the other Knowledge Areas to provide an overall view of the project. The project manager is ultimately responsible for the project as a whole.
- Projects and project management are integrative by nature, with most tasks involving more than one Knowledge Area.
- The relationships of processes within the Project Management Process Groups and between the Project Management Process are the main focus area of the integration.
- Project Integration Management is about:
    - ❖ Ensuring that the due dates of project deliverables, the project life cycle, and the benefits realization plan are aligned.
    - ❖ Providing a project management plan to achieve the project objectives.
    - ❖ Ensuring the creation and the use of appropriate knowledge to and from the project.
    - ❖ Managing project performance and changes to the project activities.
    - ❖ Making integrated decisions regarding key changes impacting the project.
    - ❖ Measuring and monitoring progress and taking appropriate action.

- Collecting, analyzing and communicating project information to relevant stakeholders.
- Completing all the work of the project and formally closing each phase, contract, and the project as a whole; and
- Managing phase transitions when necessary.

2.1.3.2. Project Integration Management Processes

Like many other management aspects, specific processes are employed in managing integration of project activities. PMI, in its latest edition of the PMBoK guide, describes the Project Integration Management processes are:

- **Develop Project Charter**—The process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.
- **Develop Project Management Plan**—The process of defining, preparing, and coordinating all plan components and consolidating them into an integrated project management plan.
- **Direct and Manage Project Work**—The process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.
- **Manage Project Knowledge**—The process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning.
- **Monitor and Control Project Work**—The process of tracking, reviewing, and reporting overall progress to meet the performance objectives defined in the project management plan.
- **Perform Integrated Change Control**—The process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating the decisions.

- **Close Project or Phase**—The process of finalizing all activities for the project, phase, or contract.

The Project Integration Management processes are presented as discrete processes with defined interfaces while, in practice, they overlap and interact. (PMI, 2017) The more complex the project and the more varied the expectations of the stakeholders, the more a sophisticated approach to integration is needed. Usually the links among the processes in the Project Management Process Groups are often iterative. For example, the Planning Process Group provides the Executing Process Group with a documented project management plan early in the project and then updates the project management plan if changes occur as the project progresses. (PMI, 2017)

2.1.3.3. Trends and emerging practices in project integration management

Like most other knowledge areas, advancement and trends are inevitable in project integration management. The Project Integration Management Knowledge Area requires combining the results from all the other Knowledge Areas. Evolving trends in integration processes include but are not limited to:

- Use of automated tools. The volume of data and information that project managers need to integrate makes it necessary to use a project management information system (PMIS) and automated tools to collect, analyze, and use information to meet project objectives and realize project benefits.

- Use of visual management tools. Some project teams use visual management tools, rather than written plans and other documents, to capture and oversee critical project elements. Making key project elements visible to the entire team provides a real-time overview of the project status, facilitates knowledge transfer, and empowers team members and other stakeholders to help identify and solve issues.

- Project knowledge management. The increasingly mobile and transitory work force requires a more rigorous process of identifying knowledge throughout the project life cycle and transferring it to the target audience so that the knowledge is not lost.

- Expanding the project manager's responsibilities. Project managers are being called on to initiate and finalize the project, such as project business case development and benefits management. Historically, these activities have been the responsibility of management and the project management office, but project managers are more frequently collaborating with them to better meet project objectives and deliver benefits. Project managers are also engaging in more comprehensive identification and engagement of stakeholders. This includes managing the interfaces with various functional and operational departments and senior management personnel.

- Hybrid methodologies. Some project management methodologies are evolving to incorporate successfully applied new practices. Examples include the use of agile and other iterative practices; business analysis techniques for requirements management; tools for identifying complex elements in projects; and organizational change management methods to prepare for transitioning the project outputs into the organization. (PMI, 2017: PP: 73)

David et al (2008) stated Integration management refers to a comprehensive managerial activity which coordinates and integrates all managerial activities on project schedule, cost, quality, scope, procurements, and others from a big picture view to maximize the overall results of a project. Identified integration management activities are: establishing an integration management organization and management system, working out project management plans, and real-time monitoring of the project's overall operation, solving conflicts and problems timely, and integrating change control. Moreover, the follows are identified key issues for the project integration management:

- Lifetime integration management plan for all elements
- Plan covers all activities and relationships of each management element
- The project office is responsible for unified management of the elements
- Integrated analysis and control for changes conducted (David et al, 2008, pp 392)

On their study of a Spaceship project management, David et al (2008) indicated systematic scheme development, dynamic configuration management and control, precise quality and safety management, integrated management by objective (MBO), and engineering parallelism are the main characteristics of successful project management.

We can see that in addition to the one main characteristic identified above which is integrated management by objective (MBO), there is an element, “integration management” with in the “Systematic Scheme Development” major chrematistic.

The integration management was thought to be composed of project tasks, the technological plan summary, project results, overall project objective, technological objective, quality objective, schedule objective, cost control, ideology of the project, milestones, project phases, integrated change control, and so forth with regard to this specific project. David et al (2008). This indicated how central is the project integration in delivering a successful project.

We have seen in the previous section how fundamental is the project integration management. It is indeed the only knowledge area having process in all process groups. The following figure from PMI shows the interactive feature of the knowledge area. The interactive feature of the KA makes it a central focus for project managers. Having properly employing project integration management leads to having proper understanding of all major aspects of the project and its implementation. The following figure from PMI (2017) clearly illustrates how central is the KA on the project management.

The table on the following page shows summary of the elements and practices identified by David et al (2008).

Table 2.1: Elements and Practices of PM

Major Characteristics	Elements and Practices
Systematic Scheme Development	• configuration management • schedule management • quality management • cost management • reliability and security management • The software engineering management • HR management • procurement and material assurance management • information and communication management • risk management • integration management
Dynamic Configuration Management and Control	• Overall Analysis to Each Configuration Variation • Evaluations and the Assessments at Different Levels • Tracking and Follow Up • Five Strict Standards to Follow • Strict Record and Check in Implementation • Compilation and Post-Factory Evaluation • Monitor Configuration Variation During Spaceship Test, Summarize After Test
Precise Quality and Safety Management	• Process Management Fostered by Forms • Test Overcast Analysis and Check • Reading and Comparison of the Fine Test and Demonstration Data • Double Check Activities • Key Technology Confirmation and Double-Checking • Reliability and Security Management for Astronauts • Quality Problems Intersection Analysis • Product Quality Countercheck • Quality Control on Key Items and Immeasurable Items • "Triple Zero Faults" Quality Culture • Zero Faults at Each Phase and Quality Analysis.
Integrated MBO and Engineering Parallelism	• Manned Spaceship Schedule Divided into Parts for Implementation of MBO • System Planning with Parallel Engineering • Project Flow on MBO and Parallel Engineering. • Project Flow on MBO and Parallel Engineering.

Source: David et al (2008).

2.2. Empirical Studies

Rashad (2011) indicated Project management and project integration management are very important roles in project success. Project integration management is an important role in any project's success. It is thought they ensure all of the elements that are necessary to complete a successful project. This give important insight toward the fact that not only indication of how important project integration management is needed, but also its relevant value for project manager is very relevant.

A research on "The effect of integration on project delivery team effectiveness by Bernard et al (2010) concluded that whilst integration is desirable, it is not the only requirement or condition for improved teamwork within a construction sector context. The findings suggest that the role and value of integration in project teams is unclear relative to other performance enhancing approaches. They indicated integration can help improve teamwork. Practices that meet the various requirements of integration either complement or increase the likelihood of fulfilling the key elements of effective teamwork. This study is very relevant in relation to project. However, the focus is on the team integration which can be considered as part of the overall project integration. The project report considers these recognitions of integration management and tries to find out its relative perceived value in delivering successful project.

Ejigayehu (2018) indicated a significant, positive relationship doses exist between post-merger Integration success and project management effectiveness. Despite the study is not thought to identify a cause-and-effect relationship between Post-Merger Integration success and project management effectiveness, the research implied it is possible the later could be improved by successfully implementing project integration management processes. Despite the project in study is not part of any merger or acquisition, it shares on the objective wit this study. Both tries to understand the role of integration management for project success while the approach is different.

Henry (2014) indicated the section "integrated change control" in the Project Integration Management KA of PMI is described as a concerted effort to coordinate changes across all knowledge areas. It is indicated to be a logical location to address organizational change management issues since it drives project scope, schedule, cost, quality, risk, and procurement. This study concentrates on the "integration of project management and organizational change

management" and how necessity it becomes a necessity nowadays. More of literature analysis is employed on this study.

In addition, an investigative study by Ying-Yi et al (2015) on 20 Master's PM degree programs around the world found that project integration KA is among the priorities in terms schedule hours taught. This indicate not only the knowledge are is important but also it get priority among educational institutions. This is another indicator on how valuable integration management for project success and its improving attention from time to time.

On another study focused on relative value project KA, Zwikael, (2009) stated although the Integration KA has a very high influence on project success, project managers do not receive enough support in executing its processes. It is found in this study that planning processes from the integration KA have the highest extent of use, followed by Time and Scope. Four KAs [Integration, Time, Scope, and Human Resources] are found to have the highest extent of use by project managers and the highest impact on project success. In addition, the study also indicated Integration and Cost KAs have the highest importance in meeting schedule and cost targets. The project under study employed the same approach. The difference is in that only comparing the integration management with all the other KAs is conducted instead of ranking.

On an investigate study of the impact of project implementation effectiveness, successful integration and strategic alignment, Aklilu (2017) has identified a significant positive effect of three independent variables (project successful implementation, integration and strategic alignment) on organizational performance by taking a vast samples.

Young et al (2002) stated project integration management is the process that ensures various elements of the project are properly coordinated. It is indicated on this study that project and organizational success relies on integrating effective PM strategies with proper utilization of PM techniques at different maturity levels. Project control processes are also integrated to minimize the risk of scope, cost, schedule, and quality management. The major findings of this study are that there are five project management processes maturities and the more mature project management process become, the more integration is its key feature.

Moreover, Thomas (2018) examined the effect of project integration management process on project success by taking a case of bank project. According to the study, finding is stated to have

indicated a positive and significant association between Project Initiation, Project Planning, Project Execution, Monitoring and Control and Project Closure on project success. Regression analysis are given on this study to see effect relationship. The project under study adds to this and compares integration management with the other KAs.

Hadi et al (2017) stated Project Integration Management area aims at fusing all the other functions into a comprehensive set of working tools and techniques that help Project Managers achieve the goals of their projects successfully. The researchers claim the integration of project management KAs has not been tested before in any industry and their study is solving this. The conclusions indicated validation area of the other eight knowledge area {the study assumed nine KA considering publications issues before project stakeholder management is incorporated}. This study shows hoe limited is the literature on integration management and the project under consideration supplements to this to give more comparative analysis takin a practical case.

Likewise, Johanna et al (2007) indicated integration as a project management concept in industrial system deliveries. The study outlined different forms of integration and outcomes of integration as a project management concept in industrial projects. They stated issue of integration becomes even more relevant (and complicated) due to the recent trends to offer innovative combinations of products and services tailored to each customer. In their paper, the researchers argued that project management, in order to be able to do this, has to consider the concept of integration in several contexts as a means for successful deliveries and transformation since Managing large, multi-task projects is a complex phenomenon, and constitutes a major challenge to the entire project network. In addition to giving detail theoretical and conceptual background on the area and by focusing on integration that occurs at the end of projects., the researchers agues the ‘integration problem’ can be solved if the understanding of integrating is acknowledged.

We can see from the above empirical investigation that the project integration KA is central in delivering a successful project and that attention paid to is improving from time to time. If integration is managed appropriately, there may not be a way of checking every aspect and phases of the project as in line to each other. The integration management in this regard serve as the gear connecting all other deliverable and like the junction of a pipe that smooths effectives

flow of processes. Having these in mind, the study tries to see the relative perceived value the integration management in a project relative to the other KAs.

Chapter Three: Research Methodology

As literature indicates, research methodologies and methods are two different aspects of research despite being used interchangeably in various occasions (Kothari, 2004). These two important terms basically guide the data consideration, collection, analysis, and interpretation aspects of the research. In line to this, this chapter introduces methodologies and methods of the project study under consideration. Accordingly, all the approached followed to answer the research questions are elaborated in the following section.

3.1. Type of research project

The basic types of research are Descriptive or Analytical, Applied or Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical and Some Other Types of Research. (Kothari, 2004). A mixed approach is employed in the project and the research type is assumed to be more of descriptive having a room for an exploratory discussion. Analytical method on responses with verifiable observations and applying empirical tactic on studying identified factors of Project Integration Management is employed to this end.

3.2. Research Design

As proclaimed by Kothari (2004), Research is conducted in two approaches, quantitative (the one that applies numbers) and the qualitative. In addition, Creswell (2009) stated that selection of a research design is also based on the nature of the research problem or issue being addressed, the researchers' personal experiences, and the audiences for the study. More interesting section are indicated by the author on the forms mixed research could take including QUAN+QUAL- Converge results, QUAN+qual- explain quantitative results and QUAL+ quan-explore and generalize.

The project report is designed both in qualitative and quantitative approaches. A mixed research methodology is followed on the project study. Qualitative and quantitative approach are employed having more emphasis on quantitative discussion. The study is applied taking an actual case and based on data quantitative and qualitative data for empirical results.

The research project employed the first case QUAN+QUAL-converge results. In addition to saving time, this helped data triangulation among interview and questionnaire responses in a real time manner. Pursuing sequential method is thought to take time and could result in loss of data as well. In addition, the mixed research approach employed have an exploratory nature as the main purpose of the project is assessing the perceived value and application of project integration management relative to the other KA during two life cycles of the project: project execution and monitoring and controlling.

3.3. Data Sources

The selected project is one of the main industrial parks being developed by the public enterprise "Industrial Parks Development Corporation". Project manager, project coordinator, project team, consultant team, contractor team and client team are identified to be data sources of the project in filling questionnaire surveys and interviews. In addition to the primary sources, document review is performed on secondary data sources. The secondary data sources are project reports, project proposal, fliers, brochures and other institutional materials collected from the project owner and its stakeholder/s.

3.4. Population and samples description

The population of the study is the area from which the samples are selected. From this, sample frame can be identified. As highlighted above, all the project participants are targeted to be for samples. This indicated census study of samples is employed for the project. Those samples include the site experts and admin staffs located in headquarters. This comprises the team starting from the lower level project participants to middle level and higher-level project coordinators and or manager. All these combined are deemed to be study population. The whole project team, 40 in number is identified to be population size. From this, seven does not directly follow the project and are excluded from the questionnaire samples. The remaining, 33 in number are identified to be study samples, therefore.

3.5. Sample Size and Sampling Technique

As highlighted, the project took consideration one actual case which is Kilinto Industrial Park and only project participant in this project. It is assumed this feature would create relatively more homogenous sampling frame and population. Both data on questionnaire and interview are

collected through convenient sampling. The total staff of the project, which are approximately 40 are deemed to be the study population. As a result, except the team which does not follow the project closely, the core team for sample are selected to be 33. For interview, on the other hand, three samples are taken: One project team lead, one project coordinator and one project manage were targeted. The interviewed samples have also participated in filling questionnaires.

It is believed that, the research questions stipulated in chapter one cannot be answered through randomly collected data. It is assumed, even if a response could be gained through randomization, response might not be valid because both the integration management and the other KAs needs expertise in order to be judged as more important from each other. Therefore, subject matter knowledge is needed to answer the questionnaire and the interview. To have the relevant and valid responses, a convenient nonprobability sampling technique is employed while selecting samples. In addition, the population study is few, and all are considered as study samples.

3.6. Data Analysis

Since the approach followed is a mixed method, both primary and secondary having quantitative and qualitative nature are collected and analyzed. Documentation is performed for all the necessary relevant sources. Organization and categorization is done for the data collected through interview and all other secondary data sources as well. Qualitatively collected data are converted to appropriate passages (contexts), written down and discussed accordingly.

The second part of the data s related to quantitatively collected surveys. Data collected through the questionnaire is analyzed using Statistical Package for Social Science (SPSS). Measure of tendency statistical analyses are employed. Since the project focuses on perceived value of integration, an ordinal data type is needed. Perception of samples are collected and encoded in a five Likert scale that represent degree of agreement and analyzed using principal component analysis application of SPSS software.

In order to analyze Likert scaled responses, factor analysis or Principal Components Analysis (PCA) is found relevant. All factor responses are analyzed accordingly, and factor reduction techniques are employed at last. As suggested by Goldberg et all (2006), factors computed values of Eigenvalues are used for factor reduction purpose.

3.7. Data collection instruments

Two major types of data collection instruments are used in this project for the two types of data collected.

3.7.1. Primary: Primary data are collected using questionnaire and interviews. Questionnaire Survey is developed with reference to PMBoK guide 6th edition in a way it can indicate relative value of applying project integration management and distributed to samples. The second part of the primary sources is related with the interviews. 6 major leading questions are developed, and samples are approached with this. A non-structured and open-ended approach is employed here to give flexibility and freedom to respondents.

3.7.2. Secondary data: in addition to the primary data, secondary data are also considered in the project. Different types of documents found in different formats are utilized here.

3.8. Validity and Reliability Analysis

It is found necessary to consider validity and reliability analysis of the project study. To check valid responses of samples, an effort is done to exclude respondents which are not familiar with the focus of the study. The population study is reduced from 40 to 33 as a result. In addition, any missing response is cross checked as sample are re-approached for confirmation.

Katherine (2014) stated reliability can be understood by relating it to a "true score" and conceptually, a "true score" is assumed to be average of scores the person if that person were to complete a test infinite times. Katherine also stated the reliability describes the consistency, or correlation, of a set of scores of the person or the factor. The Cronbach's Alpha" comes to play here. Keith (2017) highlighted how important "Cronbach's Alpha" test of reliability is in social science studies. As indicated by the author, in addition being one of the most important and universal statistics in research involving test construction and use the, Alpha is commonly reported for the development of scales intended to measure attitudes and other affective constructs. Since the collected data is a project team's opinion, it is found relevant to employ this. An alpha value of less than 0.6 is not suggested to be enough for reliability purpose and the

more it approaches to 1 is considered to be good, in general. The cut off 0.6 Cronbach's Alpha test of reliability is used, therefore.

Goldberg et all (2006) explained Factor analysis and component analysis are statistical techniques that were first introduced by Pearson and Spearman. This study indicated that computed values of Eigenvalues in statistical software packages can be used in factor loading. A factor loading is the correlation between the observed variable and the factor for the varimax pattern. Correlations of .50 or above are what we mean by "high" factor loadings. The project study employed SPSS software to compute Eigenvalues of all the components analyzed and it utilized. Despite it is criticized by some authors,) The very common suggested way of retaining principal components with eigenvalues of 1.00 or above, forwarded by Kaiser originally in 1960, is assumed. In addition, a factor loading of 0.5 is employed for factors loading purpose.

The following tables shows observed reliability test results.

Table 3.1: Project Study Test of Reliability

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.930	.930	18

Table 3.1 shows that, for the 18 survey items, the reliability test result shows Cronbach's Alpha value of .93, which is significantly adequate compared to the suggested standard value of .6. It can be concluded therefore that; the test result shows good test of reliability.

In addition, factor reduction is employed for the project study. The following table indicates observed test of reliability for extracted components.

Table 3.2. Extracted Components Reliability Test Result

Components	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
1	.915	.916	6
2	.908	.907	5
3	.925	.926	5
4	.786	.786	2

It can be observed from the above table that reliability test of the extracted components indicated a very good level of observed reliability test result. Only one component has relatively lower

level of result [component 4 with Cronbach's Alpha value of .786]. It still is above the suggested level albeit.

Missing Dara: No missing data is identified on the survey results and for this, no measurement action is taken on this project study.

3.9. Philosophical Assumptions/Worldviews

John et al (2018) suggested researchers to consider the philosophical assumptions that provide a foundation while conducting their study. They believe this worldview is what mixed method researchers bring to their inquiry and composed of assumptions and beliefs about knowledge informs their study. Despite various writers are believed to provide worldview possibilities, John et al found four worldviews are most useful for informing mixed methods research. These are: Postpositivist, Constructivist, Transformative and Pragmatist.

Postpositivist is stated to be associated with quantitative approached and detail relationship aspects while constructivist is typically associated with qualitative approached and works from different set of assumptions. John et al (2018). The project report assumes these world views mainly than the other since it employed mixed method approach (qualitative and quantitative).

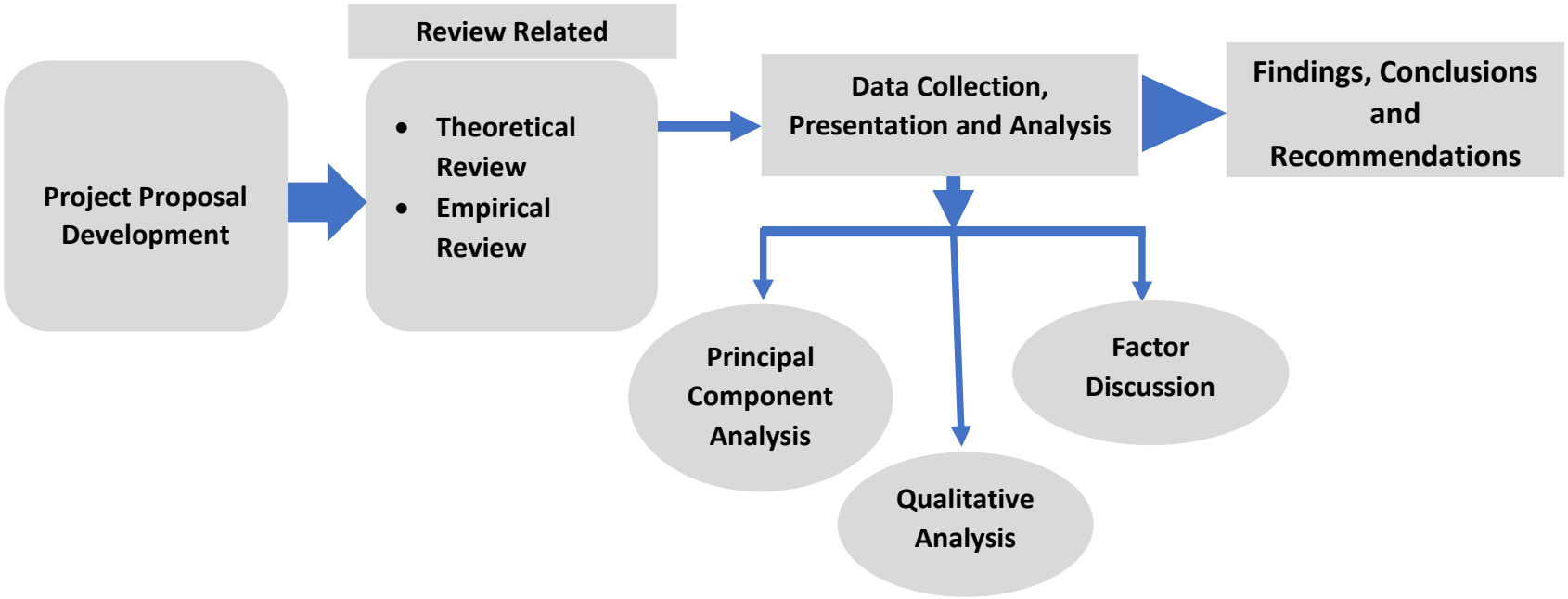
3.10. Ethical Considerations

The project study presumed and observed proper research ethics. Before data is collected from respondents, illumination of the project purpose and approach is conducted. No detail personal info of samples is collected except general and unanimously depicted descriptive figures. The researcher has followed ethically and morally applicable procedures in conducting the project and data is collected with consent of the participants. All third-party material and conducted studies are acknowledged. Secondary sources utilized are cited in the text using appropriate recommended citation methods and list of reference is given at end.

3.11. Project Study Conceptual Framework

The assessment study followed distinct project studying procedure. Despite most of the approach followed and methodologies employed are discussed so far, it is found very relevant introducing to the conceptual framework employed. Accordingly, the following figure depicts project study's conceptual framework.

Figure 3.1. Project Study Conceptual Framework



Chapter Four: Results Analysis and Discussion

This chapter details all responses collected from samples and secondary sources. The chapter has three major parts. on the first part is about sample response rate. The second part focuses on respondents' demographic data presentation. The third part that takes most of the discussion is factor analysis.

4.1. Response Rate

It is indicated in earlier chapter the total targeted sample are 33. A questionnaire survey is distributed to the samples and 27 response is collected. This is computed to represent the about 81% of the targeted sample and about 68% of the total project population. Response rate of questionnaire survey is realized to be 81%.

4.2. Demographic Presentation of respondents

Demographic presentation of respondents is assumed to give an important indicator on the project participants. With this regard, frequency and percentage discussions are given. Five major variables are included here: age, academic level, study area, work experience and project/job position.

Gender

As it can be grasped from table 4.1, most of the respondents are Male in gender being 18 out of 27 samples or representing approximately 68% of the respondents. Female are identified to represent approximately only 33% of samples and they are half of the Male gender in number.

Academic Level

Respondents level of academic qualification is found to be moderately varied. The table in following page indicates this fact. Most respondents are identified to be Master's degree holders in academic qualification while many have BA degree. Only one respondent has diploma qualification.

Years of Experience

Even much more diverse than the academic qualification is samples' years of experience in project or project related activities. The following table shows the fact that most of the

respondents representing about 52% has 6 to 10 years of project activity experiences while 6, which accounts for approximately 22% have less than 6 years of experience. While 5 or approximately 19% are deemed to have 11 to 15 years of experience, only 2, representing approximately 7%, have more than 20. The following table is presented as evidence on this.

Table 4.1: Respondents Demographic Data Presentation

Data	**Frequency**	**Percent**	**Valid Percent**
Gender			
Female	9	33.3	33.3
Male	18	66.7	66.7
Total	27	100	100
Academic Level			
Diploma	1	3.7	3.7
BA/BSc	11	40.7	40.7
MA/MSc	15	55.6	55.6
Total	27	100	100
Experience			
less than five years	6	22.2	22.2
6 to10 years	14	51.9	51.9
11 to 15 years	5	18.5	18.5
More than 20 years	2	7.4	7.4
Total	27	100	100

Project Position

Respondents project/job position is found to be very dispersed than any other demographic data. Some of the important project position by participant are master plan expert, Project Officers, team leaders, directors, and the like. Annex 3 provide full list of respondents' job position.

Study Area

Like position in above, study area is found to be dispersed. Many are identified to have studied Business, however. Civil Engineers and Architects are significant I number comparative the other professions as well. Annex 3 provide full list of respondents' study area.

4.3. Factors Analysis

This section details out the factor analysis of the study. Three stage discussions are employed here. The first part explains about details of factors' descriptive discussion. The second part detail on the factor's correlation and statistics. The third part is related with factor extraction and loadings. To ease discussions factors are given codes of item numbers. Each factor compares relative value of project integration management to each other KAs. Accordingly, for the two phases of the project life cycle, project execution and project Monitoring and Controlling, 18 comparative factors are collected and coded with item number. Factors representing each item number are listed in Annex 2.

4.3.1. Factors Descriptive Analysis

Table 4.2 indicated respondents' level of agreement for a factor on a scale of 1 to 5. Accordingly, standard mean score of a response is deemed to be 3 [(1+2+3+4+5)/5]. Any value above this indicated inclination to respondents' agreement with the factor indicating that project integration management is considered to have better role than other KAs for that specific life cycle from the project team view.

It can be identified that mean score of 3.96, is observed in considering PIM to have relatively better role than project stakeholder management during monitoring execution. Following to this are valuing PIM to have relatively better role than project communication management during project execution and project cost management during project Monitoring and Control, with same level mean score of 3.81. A mean score of 3.78 and 3.7 is observed in considering PIM to have better role than project resource management during project Monitoring and Control and project stakeholders' management during project execution, respectively.

The following Tables shows the mean and related descriptive statistics of the factors.

Tables 4.2. Factors descriptive statistics

	Items	N	Mean	Mode	Std. Deviation	Minimum	Maximum
1	Project Integration Management is more valuable than project scope management for project execution	27	3.44	2	1.188	2	5
2	Project Integration Management is more valuable than project schedule management for project execution	27	3.19	2	1.178	1	5
3	Project Integration Management is more valuable than project cost management for project execution	27	3.30	2	1.235	1	5
4	Project Integration Management is more valuable than project quality management for project execution	27	3.52	2	1.189	2	5
5	Project Integration Management is more valuable than project resource management for project execution	27	3.56	4	1.188	1	5
6	Project Integration Management is more valuable than project communication management for project execution	27	3.81	4	1.111	1	5
7	Project Integration Management is more valuable than project risk management for project execution	27	3.48	4	1.221	1	5
8	Project Integration Management is more valuable than project procurement management for project execution	27	3.52	4	1.189	1	5
9	Project Integration Management is more valuable than project stakeholders' management for project execution	27	3.70	4	1.203	1	5
10	Project Integration Management is more valuable than project scope management for project Monitoring and Control	27	3.52	5	1.189	2	5
11	Project Integration Management is more valuable than project schedule management for project Monitoring and Control	27	3.30	2	1.325	1	5
12	Project Integration Management is more valuable than project cost management for project Monitoring and Control	27	3.81	4	1.075	2	5
13	Project Integration Management is more valuable than project quality management for project Monitoring and Control	27	3.52	4	1.221	1	5
14	Project Integration Management is more valuable than project resource management for project Monitoring and Control	27	3.78	4	1.155	1	5
15	Project Integration Management is more valuable than project communication management for project Monitoring and Control	27	3.52	4	1.122	1	5
16	Project Integration Management is more valuable than project risk management for project Monitoring and Control	27	3.37	4	1.305	1	5
17	Project Integration Management is more valuable than project procurement management for project Monitoring and Control	27	3.44	4	1.340	1	5
18	Project Integration Management is more valuable than project stakeholders' management for project Monitoring and Control	27	3.96	5	1.192	1	5

Most factors are ranked in the middle having near score values. A mean score of 3.56 is identified in viewing PIM to have relatively better role than project resource management for project execution. Following is observed the same level of 3.52 in viewing PIM to have better role than project quality management and project procurement management during project execution, and mor valuable than project stakeholders' management, project quality management and project communication management during project Monitoring and Control. A mean score of 3.48 is identified in viewing PIM to have better role than project risk management during project execution while a means score of 3.44 is observed in viewing PIM having a better role than both project scope management during project execution and project procurement management during project Monitoring and Control.

In viewing PIM to have better role than project risk management during project Monitoring and Control, a mean score of 3.37 is observed . With same observed mean score of 3.3, PIM is viewed to have better role than project cost management during project execution and project schedule management during project Monitoring and Control. The lowest of the mean score of 3.19 is identified in viewing PIM to have better role than project schedule management during project execution stage.

One important aspect identified is, there is no identified formal tracking tool of the project integration management KA that can allow comparison with the other KAs for the project. It is indicated all knowledge areas are applied as integrated manner at the same time than segregating them. It is also identified that some project teams consider project integration management task is done within the framework of project scope management for the fact that it is the coordination of all elements of a project. This is thought to includes coordinating tasks, resources, stakeholders, and any other project elements. in addition to managing conflicts between different aspects of a project, making trade-offs between competing requests, and evaluating resources.

Others indicated that, project integration management is surely paramount but, in some context, other KAs may also be found important. The project phases are presumed to play an important role here. For instance, it is learnt that during the planning stage, project scope management, project risk management, project procurement management and project stakeholder's management can be significantly paramount. However, since some plans even must be integrated, integration will be useful. It may not be as valuable as some other task though.

The other facets of the finding is that, it could be difficult sometimes to give rating for the project management body of knowledge areas. Project integration may not be more valuable than project scope or project schedule or the others because to be successful in project, all the project management body need to work in coordination. It cannot be focused on scope only, budget only, quality only or integration only. All the project management area has to be used in integration. But, Project integration management ensures there is coordination among all aspects of the project. It is also indicated that, despite one project KA may not solely be more important than the other, project integration is very essential for successfully reaching a project goal. It is elucidated that without integration management, it is difficult to control the other functions of project management and it is also difficult to foresee a risky area.

Moreover, it is implied that project Integration KA consolidates all project processes and activities from Initiation to Closing of the project. Therefore, it is believed all project activities from planning to completion are done through Integration KA. In addition, since all processes from initiation to closing of the project are managed under integration, the KA is considered be valuable than any other KA in Monitoring & controlling processes than the other processes.

It is evident from the discussion that, the project integration management KA is perceived as more important for some project leaders it is perceived equally import to the other KAs by other. It is also indicated by some that there are project phases where other KAs are considered more valuable than the project integration management. The fact that there are both strongly agreeing and strongly disagreeing responses on the survey for the statement claiming project integration management is more important than the other KAs supports these discussions.

4.3.2. Total Variance Explained

Principal components analysis is employed for the project study. Each question raised in the survey is discussed based on the component assigned. Accordingly, the total variance explained indicates the variance that can be related to the component being analyzed. The following table shows the total variance explained for the 18 factors. So far it for total variance explained discussion. SPSS considers equal number of components as the number of factors.

Table 4.3. Factors Total Variance Explained

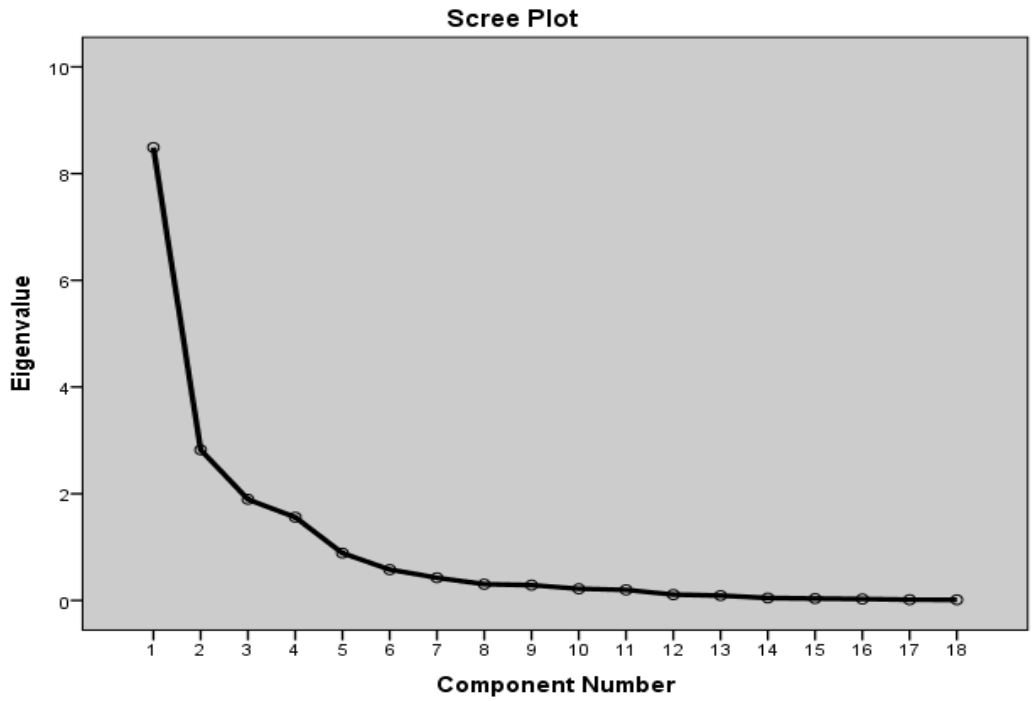
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.489	47.163	47.163	8.489	47.163	47.163
2	2.822	15.677	62.840	2.822	15.677	62.840
3	1.894	10.524	73.365	1.894	10.524	73.365
4	1.561	8.672	82.036	1.561	8.672	82.036
5	.887	4.925	86.961			
6	.578	3.211	90.173			
7	.425	2.359	92.531			
8	.304	1.688	94.219			
9	.287	1.595	95.814			
10	.219	1.218	97.031			
11	.198	1.103	98.134			
12	.109	.607	98.741			
13	.091	.507	99.248			
14	.047	.259	99.508			
15	.035	.194	99.702			
16	.027	.151	99.853			
17	.014	.077	99.929			
18	.013	.071	100.000			

Extraction Method: Principal Component Analysis.

Table 4.3. illustrated the total variance explained for all identified factors. Applying extraction method of factors having more than 1 Eigenvalues, we can have four components that explain more than 82% of the variance. Component one alone explains more than 47% of variance and is with the highest Eigenvalue (8.489). The three remaining components having more than 1 Eigen value explain about 35% of the variance. These components are bordered in green in the table. It is also important to see that, adding two more components to the components having more than 1 Eigenvalue, about 90% of the variance can be explained, as highlighted in yellow on the table. Despite these two additional components increase the variance explained, they are not extracted because they have less than 1 Eigenvalue. The more we move away from the components having more than 1 Eigenvalue and the more we selecte the components with less than 1 Eigenvalue, the less valiance is explained.

In addition to the table, another recommended way of extracting components is the screen plot.

Figure 4.1: Screen Plot presentation of components



We can see from the Screen Plot diagram that there is relatively steady change of Eigenvalues for the components. Starting from the Component number 4, the curve tends to show relatively more visible change of attached Eigenvalue to a component. The remaining parts of the graph shows even more significate variation of the curve which imply more Eigenvalue. This supports the indication of Table 4.3 which stated four components have more than 1 Eigenvalue and these explains most of the variance.

4.3.4. Factor Extraction and Relating to Components

Having identified the components does not indicate which of the 18 factors has to be in which components. Therefore, the following table indicated the classification of the factors to each factor.

Table 4.4. Components and Factors relating matrix

	Component			
	1	2	3	4
Item 5: PIM is more valuable than project resource management for project execution	.902			
Item 7: PIM is more valuable than project risk management for project execution	.848			
Item 2: PIM is more valuable than project schedule management for project execution	.767			
Item 3: PIM is more valuable than project cost management for project execution	.743			
Item 6: PIM is more valuable than project communication management for project execution	.742			
Item 4: PIM is more valuable than project quality management for project execution	.691			
Item 18: PIM is more valuable than project stakeholders' management for project M and C		.845		
Item 9: PIM is more valuable than project stakeholders' management for project execution		.841		
Item 14: PIM is more valuable than project resource management for project M and C		.783		
Item 12: PIM is more valuable than project cost management for project execution		.777		
Item 5: PIM is more valuable than project procurement management for project execution		.767		
Item 11: PIM is more valuable than project schedule management for project M and Cl			.854	
Item 15: PIM is more valuable than project communication management for project M and C			.794	
Item 17: PIM is more valuable than project procurement management for project M and C			.745	
Item 16: PIM is more valuable than project risk management for project M and C			.715	
Item 13: PIM is more valuable than project quality management for project M and C			.589	
Item 1: PIM is more valuable than project scope management for project execution				.869
Item 10: PIM is more valuable than project scope management for project M and Cl				.850
Extraction Method: Principal Component Analysis				

It can be identified from table 4.7 that the Component with the highest Eigen value and explain most of the variance has extracted 6 factors. Item 5, 7, 2, 3, 6 and 4 are extracted to be in component 1. As indicated on Annex 2, these items represent the following factors.

- Item 5: Project Integration Management is more valuable than project resource management for project execution
- Item 7: Project Integration Management is more valuable than project risk management for project execution
- Item 2: Project Integration Management is more valuable than project schedule management for project execution

- Item 3: Project Integration Management is more valuable than project cost management for project execution
- Item 6: Project Integration Management is more valuable than project communication management for project execution
- Item 4: Project Integration Management is more valuable than project quality management for project execution

Components two and three has five extracted items each as indicted on table 4.7: These represents the following factors accordingly. Components two represents the following factors.

- Item 18: Project Integration Management is more valuable than project stakeholder's management for project Monitoring and Control
- Item 9: Project Integration Management is more valuable than project stakeholder's management for project execution
- Item 14: Project Integration Management is more valuable than project resource management for project Monitoring and Control
- Item 12: Project Integration Management is more valuable than project cost management for project execution
- Item 8: Project Integration Management is more valuable than project procurement management for project execution

It is extracted, the following factors to be in component three.

- Item 11: Project Integration Management is more valuable than project schedule management for project Monitoring and Control
- Item 15: Project Integration Management is more valuable than project communication management for project Monitoring and Control
- Item 17: Project Integration Management is more valuable than project procurement management for project Monitoring and Control

- Item 16: Project Integration Management is more valuable than project risk management for project Monitoring and Control
- Item 13: Project Integration Management is more valuable than project quality management for project Monitoring and Control

Component 4 is the component with the minimum number of extracted factors. Looking. These factors are indicated to be:

- Item 1: Project Integration Management is more valuable than project scope management for project execution
- Item 10: Project Integration Management is more valuable than project scope management for project Monitoring and Control

As discussed above, the factor classification is needed to extract factors which has the highest variance explained.

4.3.6. Extracted Factors Discussion

This section discusses the cross check of the extraction performed in earlier sections. Each components reliability measure is tested based on standard of Cronbach reliability alpha test which is recommended to be 0.6 as highlighted on Chapter three.

Component 1:

The data extraction indicated six factors are loaded to be in component one. As indicated on chapter three, Reliability test is measured to be .916 which is considered to be good and sufficient. In addition, we can see mean score of items in tables 4.5 for extracted items of the components. The minimum means is identified to be 3.19 and the maximum is 3.81, for items 2 and 6, respectively.

The below table indicates factors extraction of items.

Tables 4.5 Component 1 Item Statistics			
	Mean	Std. Deviation	N
Item 2: PIM is more valuable than project schedule management for project execution	3.19	1.178	27
Item 3: PIM is more valuable than project cost management for project execution	3.30	1.235	27
Item 4: PIM is more valuable than project quality management for project execution	3.52	1.189	27
Item 5: PIM is more valuable than project resource management for project execution	3.56	1.188	27
Item 6: PIM is more valuable than project communication management for project execution	3.81	1.111	27
Item 7: PIM is more valuable than project risk management for project execution	3.48	1.221	27

In addition, we can see from Table 4.6 below summary of item statistics and inter item correlation. For component 1, the overall mean score is 3.475, while minimum and maximum item mean are observed to be 3.185 and 3.815, respectively.

Table 4.6: Component 1 Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.475	3.185	3.815	.630	1.198	.048	6
Inter-Item Correlations	.644	.396	.870	.474	2.196	.017	6

Component 2:

Five items are extracted to component 2. The following table indicates Item Statistics of the extracted items in the component. inter item correlation is identified to be positive and significant.

Tables 4.7 Component 2 Item Statistics

	Mean	Std. Deviation	N
Item 8: PMI more valuable than project procurement management for project execution	3.52	1.189	27
Item 9: PMI is more valuable than project stakeholders' management for project execution	3.70	1.203	27
Item 12: PMI is more valuable than project cost management for project execution	3.81	1.075	27
Item 14: PMI is more valuable than project resource management for project M and C	3.78	1.155	27
Item 18: PMI is more valuable than project stakeholders' management for project M and C	3.96	1.192	27

The reliability test shows a value of .907 which is deemed to be good according to the standard set in Chapter 3. The item statistics table shows item with the lowest mean value is item 8 while item 18 has the highest mean value. In addition, all the items are observed to have significantly higher mean score than the simple scale mean of 3 for a response.

Moreover, the below table indicates the summary of item statistics and inter item correlation for the component overall.

Table 4.8: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.756	3.519	3.963	.444	1.126	.026	5
Inter-Item Correlations	.661	.461	.838	.376	1.816	.014	5

The summary shows mean of item means 3.756, minimum mean of 3.519 item means and maximum mean of 3.963 on item means. inter item correlation is identified to be positive and significant.

Component 3:

The same as for Component 2 and 3, a good value of reliability test computed to be .925 is identified for component 3. The items statistics table shows the minimum mean of the items is 3.3 while the maximum is 3.52. The following tables depict this fact.

Table 4.9: Item Statistics

	Mean	Std. Deviation	N
Item 11: PIM is more valuable than project schedule management for project M and C	3.30	1.325	27
Item 13: PIM is more valuable than project quality management for project M and C	3.52	1.221	27
Item 15: PIM is more valuable than project communication management for project M and C	3.52	1.122	27
Item 16: PIM is more valuable than project risk management for project M and C	3.37	1.305	27
Item 17: PIM is more valuable than project procurement management for project M and C	3.44	1.340	27

In addition, the summary of statistics table below shows that mean of the item means is 3.43, maximum mean of item means is 3.519 and minimum mean of item means is 3.296.

Table 4.10: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.430	3.296	3.519	.222	1.067	.009	5
Inter-Item Correlations	.715	.639	.826	.187	1.293	.003	5

The mean interitem correlation for component 3 indicated positive and significant. It is identified to be higher than correlation of component 1 and component 2.

Component 4:

The fourth component is with lowest number of extracted items. The reliability test of the component shows a good score. It is much lower than the reliability tests observed for the first

three components albeit. The following table illustrates the reliability and item statistics for this component.

Table 4.11: Item Statistics

	Mean	Std. Deviation	N
Item 1: PIM is more valuable than project scope management for project execution	3.44	1.188	27
Item 10: PIM is more valuable than project scope management for project M and C	3.52	1.189	27

The item statistics of the component indicates mean of item 1 is lower than item 10. These means are generally moderate score since both the lowest mean and the highest mean of all items is not on this component.

As can be grasped from the component's summary of item statistics table 4.12 below, mean of item means is observed to be 3.481. The maximum and minimum mean of item means are observed to be 3.444 and 3.519, respectively. Moreover, the statistic also shows mean inter-item correlation is positive and significant. The inter-item correlation of the items in this component is identified to the lowest of the three components above though. Detail in all inter-item correlation is given on Annex 4 for more comparisons.

Table 4.12 Component 4: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.481	3.444	3.519	.074	1.022	.003	2
Inter-Item Correlations	.648	.648	.648	.000	1.000	.000	2

Chapter Five: Summary of Findings, Conclusions and Recommendations

The project study focuses on the relative perceived value of project integration management application during project execution and project monitoring and controlling life cycles. It is conducted taking a real case application area in one of the public industrial projects, Kilinto Pharmaceutical Industrial Park. The case considered 27 samples and three interviews to answer the research questions. Having collected both primary and secondary data, the study employed a mixed research approach and an used the Statistical Package for Social Sciences (SPSS) for data analysis.

This chapter explains the major findings, conclusions and recommendations and future suggested research areas. The conclusions are given following the presentation and discussion captured in Chapter four. These include both the quantitative discussions give on the survey responses and the qualitative discussions given for the interview responses and open-ended questions on the survey questionnaire. Recommendations are forwarded basing only on findings of the data collected on the project study.

5.1: Major Findings

Respondents mean level of agreement is identified to be in the range of 3.19 for item 1 and 3.96 for item 18. Since the applied response is identified to be in the range of 1 to 5 (From strongly Disagree to strongly Agree), the standard mean level of agreement is assumed to be 3. All identified level of agreements is deemed to be more than this. However, there is no mean score that surpassed 4, which is termed as “Agree”. The interview results indicated that there are some conditions where other KAs are thought to be mor valuable than project integration management for specific project phases. This explains the fact that there is no complete level of agreement that considers project integration management more important than the other KAs. It however lies in the range of neutrality and agreement. One valuable point found with the interview is that, even though there may not be level of agreement treating integration management more important on the project execution and project monitoring and controlling, the KA is considered to be the most important of all the KAs by many respondents in delivering successful project over all.

Based on principal components analysis and employing Eigenvalue of 1 extraction method for factors, only four components explain about 82% of the total variance and six components explain merely more than 90% of the variance.

All 18 survey items are grouped based on response and factor loading method of principal components analysis. Accordingly Items 5, 7, 2, 3, 6 and 4 are extracted to be in component 1 which explains about 47% of the total variance and Items 18, 9, 14, 12 and 8 are extracted to be in component 2 which explains about 15.7% of the total variance. Component 4, having extracted two items explains the lowest proportion of the variance, approximately 8.7 %. Likewise, Component 3 which is the factor with five items explained the next lowest proportion explained variance approximating to 10.1%.

5.2. Conclusion

The project study followed a mixed approach on assessment of relative perception of project teams with regard to role of project integration management during project execution and monitoring and controlling. By taking samples through non-random convenient sampling method, it is concluded that project integration management is considered the most important KA in most cases while there are occasions in project whereby other KAs play a better role for success of the project.

It is observed in the results that, two components having 11 extracted items (factors) represent most of the variance explained. It can be concluded therefore that, the project implementing team should focus on the two components mainly and then on the other two components which explains lower proportion of the variance and having seven extracted items or factors. The data in general is observed to have a very good reliability based on Cronbach's Alpha test of reliability. Employing a factor loading of 0.5 as recommended by scholars (Goldberg et all, 2006), and applying factor reduction-based Eigenvalue of value 1, four major components are extracted, and items are assigned accordingly.

Qualitatively collected and discussed data also indicate that project integration management has a priceless value in delivering successful project. It is indeed indicated that, it helps to check all activity flows of the project phase went as planned and expected output are realized. However, it is indicated by some samples that, unconditional ranking relative to other KAs can be difficult

since there are few project occasions whereby other KAs have better important than project integration management. While project integration management is the most important in delivering over successful project, this may not be the case always.

5.3. Recommendations

Based on the findings and results of the analysis, the following key recommendations are forwarded to the project organization in general and the project team in particular.

5.3.1. To the project organization (the industrial parks development corporation)

It is identified there is no system of tracking how many efforts are invested in the project KAs. A general systematic follow up tool of project management and the project integration management KA is needed, therefore. Since this is the only KA having in touch in all areas and in all project phases, the more systematic management is employed the more successful will the project management efforts be.

5.3.2: To the project team

The result of this study indicated that there are areas whereby project integration management KA is better than the other KAs and there are project occasions it is not. Careful attention is needed to identify which KA is most indispensable for which activity and resources have to be invested appropriately on that KA.

It is deemed all KA are important in most cases. To deliver success in project however, project integration management is believed to be to have better role. In focus of overall project success, project integration management has to be given focus more than any other KA. This is especially very relevant for the project managers or project coordinators or program manager due to the fact it is this team who oversee overall project performance.

Based on the data and employed data analysis, it is found two components explain most of the variance proportion than all other components combined. These two components on the other hand extracted 11 (eleven) of the total 18 items in the survey. These item are Item 5, 7, 2, 3, 6 and 4 are for component 1 which explains about 47% of the total variance and Items 18, 9, 14, 12 and 8 for component 2 which explains about 15.7% of the total variance. In times of priority requirements, these items have to be given focus, based on the result.

A mixed approach of management is suggested to employ for different phases of the project. The study emphasized on project execution and project monitoring and controlling. However, it is indicated on the discussion that different KAs may have varied level of significance in different stages of the project. And accordingly, careful assessment is needed with regard to in which project life cycle is the project integration management more important than the other KAs and then attention should be paid based on assessment result.

Generally, project integration management is identified to have better important than other KAs during the project monitoring and controlling life cycle of the project. Therefore, in time of prioritization, relatively higher attention must be given to integration than other KA on this cycle.

5.4. Potential Future Research Area

It is indicated in Chapter one that; some limitations of the study are related to sample size and single case emphasis. The potential research areas are identified in line to this research gap and some of the discussion results. The following are thought to be key potent research area to follow this project study.

All phases analysis of the project management KAs. Th study focused on comparative analysis perception of project team on project integration management in relation to the other KAs. Future studies can extend this to study all project management KAs in all phases. By studying how may time does a project manager spent on following each KA, detail explanation and regression analysis elaboration can be given.

An overall project focused study of the project integration management. The study emphasized on two lifecycles of a project in which it is assumed integration management is applied more, taking KAs processes mapping on PMI's PMBoK Guide, 6th edition. This can be extended more to study the other lifecycles. Any possible engagement of the project organization before "Project Initiation" and after "Project Closure" can be considered.

Impact Assessment of Project Integration Management KA on a project: the last area for potential future research is related to understanding and assessing impact of project integration management for projects. Having an estimate on distinct impact of the KA, a multi-faceted decision-making priority can be identified.

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Annexures

Annex 1: Data Collection Instruments

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

Dear sir/Madam

I am Mebrahtom G/yes, a graduate student in Addis Ababa University enrolled in project management MA program. Currently I am undertaking a project study entitled "Relative perceived value Project Integration Management during Project Execution and Project Monitoring and Controlling. This questionnaire is designed to collect data that focuses on project management knowledge areas. The information you provide will be utilized for making conclusions in the specified area and to answer the research questions solely for academic purpose. Your involvement is regarded priceless to the study results. Your honest, careful, and complete response is invaluable.

General instructions

- There is no need to provide specific detailed personal information except the needed.
- Please mark your response in the appropriate box with a thick (✓) supply the relevant information as required.
- If you wish to contact the candidate, you may approach through +251 9 38 21 09 19 or email via mebre7989@gmail.com or geb.mebrahtom@gmail.com

  Thank you very much for your time,

PART –1: Demographic) data

Please mark (✓) selected box:

1. Your Gender

   ☐ Male ☐ Female

2. Your academic level.

   ☐ Diploma ☐ Bachelor's degree ☐ MSC/MA Degree

   ☐ PhD Others, please state _____

3. Your Study area.

   ☐ Business ☐ Electrical Engineering

   ☐ Civil Engineering ☐ Architectural engineering

   ☐ Health sector Others, please state_____

4. Your Work experiences.

   ☐ 5 years and below ☐ 6 to 10 years

   ☐ 11 to 15 years ☐ 16 to 20 years

   ☐ 20 years and above

5. Current position in the project/your company_____.

PART-2: Relative Perceived value of Project Integration Management During Project Execution

Please indicate your level of agreement with each of the following statement by marking (✓) on the space provided for the ranges: Strongly Disagree **(SD)**, **Disagree (D),** Neutral **(N)**, Agree **(A)**, and Strongly Agree **(SA).**

	SD	D	N	A	SA
1. Project Integration Management is more valuable than project scope management for project execution					
2. Project Integration Management is more valuable than project schedule management for project execution					
3. Project Integration Management is more valuable than project cost management for project execution					
4. Project Integration Management is more valuable than project quality management for project execution					
5. Project Integration Management is more valuable than project resource management for project execution					
6. Project Integration Management is more valuable than project communication management for project execution					
7. Project Integration Management is more valuable than project risk management for project execution					
8. Project Integration Management is more valuable than project procurement management for project execution					
9. Project Integration Management is more valuable than project stakeholders management for project execution					

Is there any point you would like to indicate more on the above part, please state

_____

_____

_____.

PART-3: Relative Perceived value of Project Integration Management During Project Monitoring and Control

Please indicate your level of agreement with each of the following statement by marking (✓)) on the space provided for the ranges Strongly Disagree **(SD)**, **Disagree (D),** Neutral **(N)**, Agree **(A)**, and Strongly Agree **(SA).**

	SD	D	N	A	SA
1. Project Integration Management is more valuable than project scope management for project Monitoring and Control					
2. Project Integration Management is more valuable than project schedule management for project Monitoring and Control					
3. Project Integration Management is more valuable than project cost management for project execution					
4. Project Integration Management is more valuable than project quality management for project Monitoring and Control					
5. Project Integration Management is more valuable than project resource management for project Monitoring and Control					
6. Project Integration Management is more valuable than project communication management for project Monitoring and Control					
7. Project Integration Management is more valuable than project risk management for project Monitoring and Control					
8. Project Integration Management is more valuable than project procurement management for project Monitoring and Control					
9. Project Integration Management is more valuable than project stakeholders management for project Monitoring and Control					

Is there any point you would like to indicate more on the above part, please state _____ _____ _____.

Would like to give any suggestion on the questionnaire overall, please state?_____ _____ _____ _____

Thank you very much for you time and insights,

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

Dear sir/Madam

I am Mebrahtom G/yes, a graduate student in Addis Ababa University enrolled in project management MA program. Currently I am undertaking a project study entitled "Relative perceived value Project Integration Management during Project Execution and Project Monitoring and Controlling. This questionnaire is designed to collect data that focus project management knowledge areas. The information you provide will be utilized for making conclusions in the specified area and to answer the research questions solely for academic purpose. Your involvement is regarded priceless to the quality of the study results. Your honest response is invaluable.

1. Would you mind giving me your professional background and current project position?
2. How do you formally employ the project management knowledge areas of PMBOK?
3. Which project management knowledge area is mostly in your engagement?
4. Which project management knowledge area do you see most valuable in your engagement?
5. How do you see the value of project integration management in your engagements?
6. What makes project integration management more valuable than other knowledge areas during the project execution life cycle?
7. What makes project integration management more valuable than other knowledge areas during the project monitoring and controlling life cycle?

Annex 2: Study factors/Items Coding

- **Item 1:** Project Integration Management is more valuable than project scope management for project : execution
- **Item 2:** Project Integration Management is more valuable than project schedule management for project execution
- **Item 3:** Project Integration Management is more valuable than project cost management for project execution
- **Item 4:** Project Integration Management is more valuable than project quality management for project execution
- **Item 5:** Project Integration Management is more valuable than project resource management for project execution
- **Item 6:** Project Integration Management is more valuable than project communication management for project execution
- **Item 7:** Project Integration Management is more valuable than project risk management for project execution
- **Item 8:** Project Integration Management is more valuable than project procurement management for project execution
- **Item 9:** Project Integration Management is more valuable than project stakeholders' management for project execution
- **Item 10:** Project Integration Management is more valuable than project scope management for project Monitoring and Control
- **Item 11:** Project Integration Management is more valuable than project schedule management for project Monitoring and Control
- **Item 12:** Project Integration Management is more valuable than project cost management for project execution
- **Item 13:** Project Integration Management is more valuable than project quality management for project Monitoring and Control
- **Item 14:** Project Integration Management is more valuable than project resource management for project Monitoring and Control
- **Item 15:** Project Integration Management is more valuable than project communication management for project Monitoring and Control
- **Item 16:** Project Integration Management is more valuable than project risk management for project Monitoring and Control
- **Item 17:** Project Integration Management is more valuable than project procurement management for project Monitoring and Control
- **Item 18:** Project Integration Management is more valuable than project stakeholders' management for project Monitoring and Control

Annex 3: Academic Background and Position

	Frequency	Percent	Valid Percent	Cumulative Percent
Architectural engineering	3	11.1	11.1	11.1
Business	11	40.7	40.7	51.9
Civil Emgineering, Construction Management	1	3.7	3.7	55.6
Civil Engineering	5	18.5	18.5	74.1
Deveopment Evaluation and Mangement	1	3.7	3.7	77.8
Electrical Engineer	1	3.7	3.7	81.5
Electro Mechanical	1	3.7	3.7	85.2
Health sector	1	3.7	3.7	88.9
Health sector, Chemistry and environmental science	1	3.7	3.7	92.6
Mechanical Engineering	1	3.7	3.7	96.3
Project Management	1	3.7	3.7	100.0
Total	27	100.0	100.0	

	Frequency	Percent	Valid Percent	Cumulative Percent
Ass. Project Engineer	1	3.7	3.7	3.7
ceo,manging director , general manager	1	3.7	3.7	7.4
Consultant	1	3.7	3.7	11.1
D-GENERAL MANAGER	1	3.7	3.7	14.8
Deputy CEO Assistant	1	3.7	3.7	18.5
Director	2	7.4	7.4	25.9
Expert	2	7.4	7.4	33.3
Finance	1	3.7	3.7	37.0
Finance Officer	1	3.7	3.7	40.7
Investment Expert	1	3.7	3.7	44.4
Manager	1	3.7	3.7	48.1
Master plan expert	1	3.7	3.7	51.9
Procurement Team	1	3.7	3.7	55.6
Project Officer	5	18.5	18.5	74.1
Senior Civil Engineer	2	7.4	7.4	81.5
Senior Expert	1	3.7	3.7	85.2
Team Leader	1	3.7	3.7	88.9
Team member	2	7.4	7.4	96.3
Team Member	1	3.7	3.7	100.0
Total	27	100.0	100.0	

Annex 4: Factor Correlation Data Analysis

Correlation Matrix

		Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18
Correlation	Item 1	1.000	.489	.326	.484	.364	.327	.085	-.006	.150	.648	.280	.037	-.085	.215	.138	-.061	.016	.066
	Item 2	.489	1.000	.807	.533	.639	.645	.497	.258	.122	.341	.358	.028	.359	.088	.419	.229	.287	-.050
	Item 3	.326	.807	1.000	.520	.749	.659	.616	.468	.346	.311	.532	.275	.634	.372	.607	.526	.452	.243
	Item 4	.484	.533	.520	1.000	.578	.396	.590	.292	.273	.347	.021	.439	.311	.283	.223	.144	.140	.177
	Item 5	.364	.639	.749	.578	1.000	.810	.870	.469	.254	.170	.429	.355	.643	.150	.497	.507	.467	.124
	Item 6	.327	.645	.659	.396	.810	1.000	.749	.396	.216	.309	.535	.196	.556	.147	.666	.500	.574	.256
	Item 7	.085	.497	.616	.590	.870	.749	1.000	.590	.337	.086	.337	.481	.678	.188	.513	.536	.523	.224
	Item 8	-.006	.258	.468	.292	.469	.396	.590	1.000	.838	.047	.387	.559	.576	.535	.310	.566	.671	.638
	Item 9	.150	.122	.346	.273	.254	.216	.337	.838	1.000	.192	.323	.461	.344	.671	.318	.440	.491	.743
	Item 10	.648	.341	.311	.347	.170	.309	.086	.047	.192	1.000	.631	.289	.179	.451	.425	.194	.260	.340

	Item 11	.280	.358	.532	.021	.429	.535	.337	.387	.323	.631	1.000	.364	.639	.548	.746	.668	.768	.494
	Item 12	.037	.028	.275	.439	.355	.196	.481	.559	.461	.289	.364	1.000	.691	.647	.338	.544	.486	.684
	Item 13	-.085	.359	.634	.311	.643	.556	.678	.576	.344	.179	.639	.691	1.000	.521	.695	.696	.700	.489
	Item 14	.215	.088	.372	.283	.150	.147	.188	.535	.671	.451	.548	.647	.521	1.000	.538	.516	.539	.832
	Item 15	.138	.419	.607	.223	.497	.666	.513	.310	.318	.425	.746	.338	.695	.538	1.000	.704	.711	.504
	Item 16	-.061	.229	.526	.144	.507	.500	.536	.566	.440	.194	.668	.544	.696	.516	.704	1.000	.826	.627
	Item 17	.016	.287	.452	.140	.467	.574	.523	.671	.491	.260	.768	.486	.700	.539	.711	.826	1.000	.637
	Item 18	.066	-.050	.243	.177	.124	.256	.224	.638	.743	.340	.494	.684	.489	.832	.504	.627	.637	1.000

Addis Ababa University School of Commerce

Graduate Program

Board of Examiners Approval

This is to certify that the thesis entitled "Assessment of Relative Application of Project Integration Management During Project Execution and Monitoring & Controlling Cycles: the Case of Kilinto Pharmaceutical Industrial Park" is prepared by Mebrahtom G. in partial fulfillment of the requirements for the award of the degree of Master of Arts in Project Management, as per the regulation and procedures of the university and accepted standards with respect to originality and ethicality.

Approved by: Board of Examiners

Dr. Mengistu B.	_____	_____
Advisor	Signature	Date
Dr. Solomon M.	_____	_____
Internal Examiner	Signature	Date
Dr. Maru Shete	_____	20 July 2020
External Examiner	Signature	Date