School of Commer

Addis Ababa University

College of Business and Economics

School of Commerce

Department of Project management

Effect of project management practices on Public enterprises' performance: the Case of Ethiopian construction design supervision Works Corporation (ECDSWCo - BUDSWS).

By:-Wubbante Deneke (Architect)

A Research project submitted to Addis Ababa university school of commerce in partial fulfilment of the requirement for the degree of master of art in project management

ADVISOR: Fisseha Afework (A/Professor)

JANUARY, 2024

ADDIS ABABA, ETHIOPIA

DECLARATION

I, the undersigned, declare that this research project is my original work, prepared under the supervision and guidance of **Fisseha Afework (A/Proffessor)**. All sources of materials used for the research project have been duly acknowledged. I further confirm that the research project has not been submitted either in part or in full to any other higher-learning institution for earning any degree.

Declared by**: Wubbante Deneke (Architect)**

Signature: _____

Date: _____

LETTER OF CERTIFICATION

I confirm that this research project entitled with "Effect of project management practices on Public enterprises' performance: the Case of Ethiopian construction design supervision Works Corporation (ECDSWCo)" has been done by **Architect Wubbante Deneke Tsegaye** under my supervision and guidance which shall be submitted to Addis Ababa University, College of Business and Economics, School of Commerce, Department of Project management for the partial fulfilment of the requirements for Master of art in project management distance program . it is also the candidates original work and sufficient for the submission as the partial fulfilment of the requirement for the award of masters of art degree in project management.

Advisor: **Fisseha Afework(A/professor)**

Signature: _____

Date: _____

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By:-Wubbante Deneke (Architect)

Approved by the Board of Examiners:

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ABSTRACT

Project management practices are the key factors on the performance of projects. This study aims to examine Effect of project management practices on public enterprises' performance in the Case of Ethiopian construction design supervision Works Corporation (ECDSWCo). Findings have contributed to the existing literature on project management practices on public enterprises and provide practical recommendations for ECDSWCO to enhance their internal project management practices. The research outcome is being valuable for management and corporate governance. The research involves a description research design, quantitative research approach and census method to analyse the data. The study used a primary source of data which is questionnaire for targeted staff member then the Data is analysed by description of major variables, and comparison of relationships among variables using computers. The study expects to uncover the key variables on the performance of projects. Data has been analysed by description of major variables, and comparison of relationships among variables using computer (SPSS software program). Chi-square and p-value is used to determine association between variables and p-value<0.05 was considered as significant. The study used ten independent variables those which are the ten project management knowledge areas and three dependent variables which are selected based on the constraint of project performances (time, cost and quality). From those independent variables three of them which are integration, cost and quality management practices have a significant impact on project performance. Majority of respondents suggested that a better integration, cost and quality management practices are essential for better performance of the enterprises on projects. My recommendation based on the finding of the research is that the Organization should establish a better project management practice on projects for a better performance especially on three of them mentioned above. The Organization should also prepare project management manual as a company.

Key words: *project management practice & knowledge areas, project performance.*

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ACRONYMS

PMP	Project Management Practice
PM	Project Management
ECDSWCO	Ethiopian construction design supervision works corporation
BUDSWS	Building and urban design supervision works sector
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
WES	Water and Energy Sector
TS	Transport Sector
BUS	Building and Urban Sector
GTI	Geotechnical Investigation
GTE	Geo Technical Engineering
CS	Construction Sector

CHAPTER ONE

INTRODUCTION

This chapter is composed of the following sub titles named as background study, the problem statements, research questions, objectives of the research, hypothesis, significance of the study, scope and limitation of the study and the organization of the paper

1.1 Background to the study

Project management is a discipline that involves planning, organizing, and controlling resources to achieve specific goals within a defined timeframe. It is widely used in various industries to effectively manage projects, ensuring they are completed successfully and meet stakeholders' expectations. The main objective of project management is to deliver projects on time, within budget, and with the desired level of quality. It involves a systematic approach to initiate, plan, execute, monitor, and close projects. Public enterprises play a crucial role in the economy and society for Service delivery, Economic development, social welfare, Strategic sectors, public accountability, Stabilizing market forces, Innovation and research. Project management practices are highly significant for successful project delivery and overall organizational effectiveness in efficient resource utilization, Clear project goals and objectives, Effective risk management, improved stakeholder communication, Enhanced project coordination and collaboration. As we know that the federal government of Ethiopia is currently undertaking different scaled projects by its own public bodies. It is implementing the projects by preparing policies and strategies. The projects currently implementing has a wide Range of diversifications and are from different sectors like construction, agriculture, health, education, industrial, service based and etc… All the projects which are initiated by the government are expected to be completed on time, with in the budget and cost. However, the projects that are planned to be completed on most of our government projects are not in that status. Especially the mega projects which are undertaking by the government are exposed to these issues.

Therefore the government of Ethiopia owned the projects to be managed by itself (by its own public bodies). Even though the government is managing its own projects by itself, the projects are still affected and exposed to cost overrun, time overrun and scope changes. So, if we ask that what is the main reason behind for the untimely, costly implementation of projects? It is needed to check out the project management practices.

Project Management is the process of planning and executing a piece of work from inception to completion to achieve safe achievement of objectives on time, within cost limits and to the specified standards of quality *(PM context module, AAU, 2015).* So as lack of proper project management is one of the basic reasons for in accomplishment of projects of the given constraints.

This study focused on assessment of project management practices in public (government) bodies: the case of Ethiopian construction design and Supervision Corporation to identify the gaps and suggest the recommendations by relating with current best practices *(project management institute's guide lines).*

1.2 Back ground of the organization

ECDSWCO has a combination of different sectors which are WES, TS, BUS, GTE and CS. This organization was engaged in Planning, Study, Design and Supervision Works since 1978. The Corporation has established two fully equipped and specialized centers to further enhance its capabilities. The first center boasts cutting edge Laboratory & Research facilities, facilitating innovative solutions and advancements in engineering practices.

The second center focuses on Surveying, Geospatial and Civil Informatics that are providing invaluable data and insights to support the company's pursuit of excellence and unwavering commitment to delivering services of the highest quality.

The corporation firmly believes that excellence and quality should transcend mere words. They are embedded in the very core of our values and represent our unwavering dedication to establishing a robust knowledge base and delivering exceptional and sustainable engineering solutions. We are committed to addressing

the unique challenges faced by our people and extending our expertise to contribute positively to the progress and development of Africa as a whole. Our tireless pursuit of excellence serves as the driving force behind our endeavors, enabling us to make a meaningful and lasting impact on the communities we serve.
The structure of the corporation is accurately designed to offer our clients a wide range of engineering services through various specialized business units. These units involve the WES, TS, BUS, GTE and CS, as well as the Research, Laboratory, and Training Center. Additionally, we have a committed Surveying, Geospatial, and Civil Informatics Center, equipped with advanced technology and expertise. This comprehensive organizational framework ensures that we can cater to diverse client needs and provide holistic engineering solutions across multiple domains, reinforcing our commitment to excellence and client satisfaction. *(https://www.ecdswc.com/index.php/about-us)*

1.3 Statement of the Problem

Ethiopian construction design and supervision Works Corporation is one of the government owned construction consulting companies which is currently undertaking so many government projects. This company is organized with five sectors and two centers named as building sector, water and energy sector, transport and road sector, construction sector, geospatial and surveying center, geotechnical sector and laboratory center. It is one of well known, organized and experienced institution with more than 38yrs of experience in the sector *(https://www.ecdswc.com/index.php/about-us)*. The company is currently undertaking more than 350 projects. All those projects on the way are done by integrating all the sectors and center each other. In another expression one sector's project expect an input from other sector or center. So the execution and accomplishment of the project depends on the performance of all related sectors and centers. *(Annual plan of ECDSWCo, 2015)*
The corporation has so many challenges in managing all the projects as per the given requirements. Due to the vast organizational structure and interdependency

of all sectors and centers, the project management was very difficult. Especially the integration management across the sector is one of the challenges currently the corporation is facing. The communication management is also one of the challenges.

As we discussed above, the corporation has a wide organizational structure which holds above one thousand staffs. So besides the managing the projects it is also difficult to manage the human resource too.

The main problem in the corporation is almost all projects are submitted lately or delayed from the submission dates. What can be the reasons for the delays; what makes the cost overrun and time overrun; how is the project management is going on? All the questions should be answered correctly. In general as the definition of project management indicates that it is the process of planning and executing a piece of work from inception to completion to achieve safe achievement of objectives on time, within cost limits and to the specified standards of quality *(PM context module, AAU, 2015)* the reason for untimely or late accomplishment of project is lack of proper project management practices. For instance, as indicated on table below. The mile stones under the building and urban sector of the corporation are mostly delayed. *(First quarter report of BUDSWS, 2016)*

no	Milestone	Building design	Lalibela	Urban design	Regional planning	Correspondence team	Total
1	**Submitted**	**16**	**2**	**6**	**0**	**4**	**28**
1.1	Submitted Early	5	2	6	0	0	13
1.2	Submitted Timely	2	0	0	0	0	2
1.3	Submitted Lately	9	0	0	0	4	13
2	**Not submitted**	**31**	**7**	**8**	**3**	**3**	**52**
2.1	Active	11	7	4	0	2	24
2.2	Delayed	20	0	4	3	1	28
	Total No of milestones	47	9	**14**	**3**	**7**	**80**

Table 1.2 first quarters (2016) Mile stone performance under building and urban design supervision works sector for the design departments only as of October, 2016

Source: (First quarter report of BUDSWS, 2016)

That is why I want to explore the effect of the project management practice of the corporation to address the problematic area.

Therefore the main purpose of this study is to identify the effect of the project management practice on the corporations' performance and identify the gap in respect to the best practice in the world *(PMBOK Guide lines)* and finally recommend the best solution.

1.4 Research Questions

This study answered the following research questions

i. In what ways do project management practices impact the performance of the sector?
ii. How significantly do project management practices affect the project performance within the sector?
iii. Which of the project management knowledge area has a significant effect on the project performance of a sector?

1.5 Objectives of the study

1.5.1 General Objectives

The general objectives of this study is to study the effect of the project management practice on public enterprises' performance specifically on Ethiopian construction design and supervision Works Corporation – building and urban design and supervision works sector

1.5.2 Specific Objectives

The specific objectives of this study are

- To study the effect of the project management practices on the corporations' project performance (ECDSWCo - BUDSWS)
- To examine the effect of project integration management on project-on-project performance

- To examine the effect of project scope Management on project-on-project performance
- To examine the effect of project schedule Management on project-on-project performance
- To examine the effect of project cost Management on project-on-project performance
- To examine the effect of project quality Management on project-on-project performance
- To examine the effect of project resource Management on project-on-project performance
- To examine the effect of project communication Management on project-on-project performance
- To examine the effect of project risk Management on project-on-project performance
- To examine the effect of project procurement Management on project-on-project performance
- To examine the effect of project stake holder Management on project-on-project performance

1.6 Significance of the study

As it is known that the Ethiopian construction design and supervision Works Corporation is one of eye centered the government company that has a big responsibility in implementing huge governmental projects. It is expected to deliver and accomplish the projects timely to eradicate all peoples' grievance regarding the service requested. All the projects done by the corporation are public centered projects like educational, health centers, farmer centered irrigations etc…, so if the projects are delayed, public grievance raised immediately.

Therefore, having the best project management practices, help the corporation to deliver projects timely, within budget and scope. If the projects accomplished as

per the required time, quality and scope, the public grievance has to be minimized as well.

The result from this study helped the corporation to identify the effect of its project management practices and improve its project management style and come up with better internationally accepted practices.

1.7 Scope of the study

The conceptual scope for studying the effect of project management practices on public enterprises' performance in BUDSWS involves examining how the implementation of project management principles and techniques impacts the overall performance of public enterprises. This includes investigating the relationship between project management practices and various performance indicators such as project success rates, cost efficiency, timeliness, and quality of deliverables, stakeholder satisfaction, and overall organizational effectiveness. The study would explore the specific project management practices employed by public enterprises, such as project planning, resource allocation, risk management, communication, and coordination, and assess their influence on the performance outcomes of these organizations. The research would aim to provide insights and recommendations for improving project management practices in public enterprises to enhance their performance and achieve their objectives more effectively. The empirical scope for studying the effect of project management practices on public enterprises' performance involves conducting empirical research to collect and analyze data on the actual implementation of project management practices in public enterprises and their impact on performance outcomes. This would involve selecting a sample of public enterprises and gathering data on their project management practices, such as project planning, resource allocation, risk management, communication, and coordination. The study would also collect data on performance indicators, such as project success rates, cost efficiency, timeliness, and quality of deliverables, stakeholder satisfaction, and overall organizational effectiveness.

The methodological scope for studying the effect of project management practices on public enterprises' performance involves determining the appropriate research methodology and data collection methods to investigate this relationship. The research methodology used in this study was quantitative approaches. Quantitative methods, such as questionnaires, could be used to collect data from a larger sample of public enterprises. This would allow for the measurement of specific project management practices and their correlation with performance indicators. Statistical analysis techniques, such as regression analysis or structural equation modelling, could be employed to analyse the data and identify significant relationships.

1.8 Limitations of the study

The limitation regarding this research is unwillingness of participants to return the questionnaires paper by filling it on time. So, I propose the questionnaires' format through the digital plat form (web based online questionnaires) to simplify the process and easily accessible to respondents at any time by sending it through email, telegram and other communication platforms. The other limitation is unwillingness of the corporation staffs and bosses to give documents related to my study. So, I go to find it in informal ways.

1.9 Organization of paper

This study composed of five chapters the first chapter consists of an Introduction part that includes back ground to study, back ground to organization, problem statement, research question, objectives, significance of the study, scope, limitations and organization of paper. In this chapter the main focus area of research is discussed here. The second chapter discussed on the literature review which focuses on theoretical review, empirical review and concept frame works.

The third chapter is about to discuss Research Methodology that shows how the data are collected. After showing the data collected the next process was data analysis, presentation and discussion which are briefly discussed on chapter four of the research paper. Finally In the last paragraph, the Findings, Conclusions, recommendations and area of further research discussed

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter expressed the literature reviews theoretically or empirically on project management practices internationally. This covers on the project management frame works, best practices, knowledge areas, and process groups

2.2 DEFINITION OF PROJECT

Many scholars define project in different ways. Some of them define it as follows

Jason Westland, 2006 in his book named "the project management life cycle" defines project as follows

A project is a unique Endeavour to produce a set of deliverables within clearly specified time, cost and quality constraints. Projects are different from standard business operational activities as they:

• Are unique in nature. They do not involve repetitive processes. Every project undertaken is different from the last, whereas operational activities often involve undertaking repetitive (identical) processes.

• Have a defined timescale. Projects have a clearly specified start and end date within which the deliverables must be produced to meet a specified customer requirement.

• Have an approved budget. Projects are allocated a level of financial expenditure within which the deliverables are produced, to meet a specified customer requirement.

• Have limited resources. At the start of a project an agreed amount of labor, equipment and materials is allocated to the project.

• Involve an element of risk. Projects entail a level of uncertainty and therefore carry business risk.

• Achieve beneficial change. The purpose of a project is typically to improve an organization through the implementation of business change.

(Robert K. Wysocki, 2019, pg. 04) on his book "Effective Project Management: Traditional, Agile, Extreme, Hybrid, Eighth Edition" defines projects that it is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification.

Project in general refers to a new endeavor with specific objective and varies so widely that it is very difficult to precisely define it. Some of the commonly quoted definitions are as follows.

Project is a temporary endeavor undertaken to create a unique product or service or result. *(AMERICAN National Standard ANSI/PMI99-001-2004)*

Project has three major dimensions that define the project performance are scope, time, and resource (cost)

At the last the internationally accepted Guide Book define the project as follows

A project is a temporary endeavor undertaken to create a unique product, service, or result. *(PMBOK, Project management institute, 2017)*

- Unique product, service, or result. Projects are undertaken to fulfill objectives by producing deliverables. An objective is defined as an outcome toward which work is to be directed, a strategic position to be attained, a purpose to be achieved, a result to be obtained, a product to be produced, or a service to be performed. A deliverable is defined as any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project. Deliverables may be tangible or intangible.

Fulfillment of project objectives may produce one or more of the following deliverables:

- A unique product that can be either a component of another item, an enhancement or correction to an item, or a new end item in itself (e.g., the correction of a defect in an end item);
- A unique service or a capability to perform a service (e.g., a business function that supports production or distribution);

- A unique result, such as an outcome or document (e.g., a research project that develops knowledge that can be used to determine whether a trend exists or a new process was benefit society); and
- A unique combination of one or more products, services, or results (e.g., a software application, its associated documentation, and help desk services).

A project is a temporary endeavor undertaken to create a unique product, service, or result. *(PMI, 2017).* by supporting this *(Pinto, 2019*) has supported the definition of project by PMI and has elaborated the main elements as follows Projects are complex, one time process, limited by the budget, schedule, and resource and are developed to resolve a clear goal or set of goal and customer focused. Finally *(schwalbe, 2016)* define A project as it is "a temporary endeavor undertaken to create a unique product, service, or result." Operations, on the other hand, is work done in organizations to sustain the business.

2.3 PROJECT MANAGEMENT

As we know that project is one important thing in our daily activity. All the things we have done daily have a project nature. For these projects we have to know that how we manage them. So we need project managing skills. *Jason Westland, 2006* continues by defining project management as follows

It is the skills, tools and management processes required to undertake a project successfully.

Robert K. Wysocki, 2019 also defines Project Management" it is an organized common-sense approach that utilizes the appropriate client involvement in order to meet sponsor needs and deliver the expected incremental business value."

Many scholars shows that how important the project management is in the project timely accomplishment

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management is accomplished through the appropriate application and integration of the project management processes identified for the project. Project management enables

organizations to execute projects effectively and efficiently. *(PMBOK, Project management institute, 2017)*

Effective project management helps individuals, groups, and public and private organizations to:

- Meet business objectives;
- Satisfy stakeholder expectations;
- Be more predictable;
- Increase chances of success;
- Deliver the right products at the right time;
- Resolve problems and issues;
- Respond to risks in a timely manner;
- Optimize the use of organizational resources;
- Identify, recover, or terminate failing projects;
- Manage constraints (e.g., scope, quality, schedule, costs, resources);
- Balance the influence of constraints on the project (e.g., increased scope may increase cost or schedule); and
- Manage change in a better manner.

Poorly managed projects or the absence of project management may result in:

- Missed deadlines,
- Cost overruns,
- Poor quality,
- Rework,
- Uncontrolled expansion of the project,
- Loss of reputation for the organization,
- Unsatisfied stakeholders, and
- Failure in achieving the objectives for which the project was undertaken.

Excellence in effective project management can guarantee measurable and tangible results based on scope, time and cost, which are the cornerstones to project success *(kerzner, 2018)*

2.4 PROJECT LIFE CYCLES

Project life cycle is a serious of phases that the projects pass through from its starts to completion. *(PMBOK Guide 6th edition, 2017, pg 547).* The project life cycle can be influenced by the unique aspects of the organization, industry, development method, or technology employed. While every project has a start and end, the specific deliverables and work that take place vary widely depending on the project. The life cycle provides the basic framework for managing the project, regardless of the specific work involved.

All project life cycles are constructed from five process groups and 49 project management processes.

According to *PMI, 2020 and Jason Westland, 2006*, Project life cycles consists of four phases which are elaborated as follows

Project initiation

The first phase of a project is the initiation phase. During this phase a business problem or opportunity is identified and a business case providing various solution options is defined.

Project planning

Once the scope of the project has been defined in the terms of reference, the project enters the detailed planning phase. This involves creating a:

- project plan outlining the activities, tasks, dependencies and timeframes;
- resource plan listing the labor, equipment and materials required;
- financial plan identifying the labor, equipment and materials costs;
- quality plan providing quality targets, assurance and control measures;
- risk plan highlighting potential risks and actions to be taken to mitigate those risks;
- acceptance plan listing the criteria to be met to gain customer acceptance;
- communications plan describing the information needed to inform stakeholders;
- Procurement plan identifying products to be sourced from external suppliers.

Project execution

This phase involves implementing the plans created during the project planning phase. While each plan is being executed, a series of management processes are undertaken to monitor and control the deliverables being output by the project.

Project closure

Project closure involves releasing the final deliverables to the customer, handing over project documentation to the business, terminating supplier contracts, releasing project resources and communicating the closure of the project to all stakeholders. The last remaining step is to undertake a post-implementation review to quantify the level of project success and identify any lessons learnt for future projects.

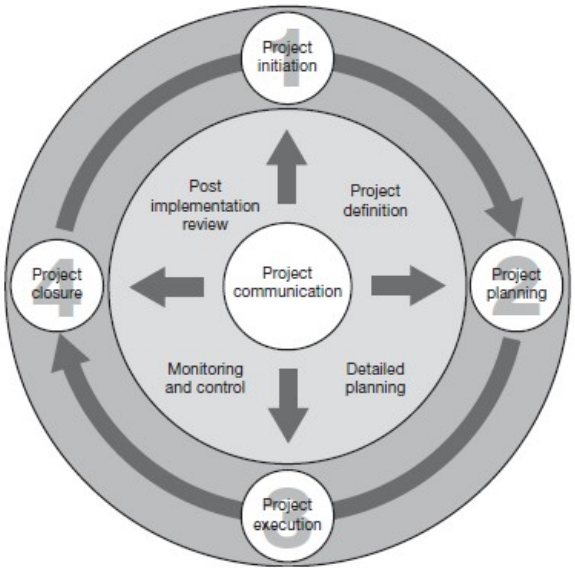

Fig 2.1: the four phases of project life cycles

Source: Jason Westland, 2006

2.5 PROJECT MANAGEMENT PROCESS GROUPS

As we discussed above project life cycles are constructed from five project management process groups. Project management processes are grouped in five Project Management Process Groups: *(PMBOK Guide 6th edition, 2017)*

- **Initiating Process Group**. The process performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.
- **Planning Process Group**. The process required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.
- **Executing Process Group**. The process performed to complete the work defined in the project management plan to satisfy the project requirements.
- **Monitoring and Controlling Process Group**. The process required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.
- **Closing Process Group**. The process performed to formally complete or close a project, phase, or contract.

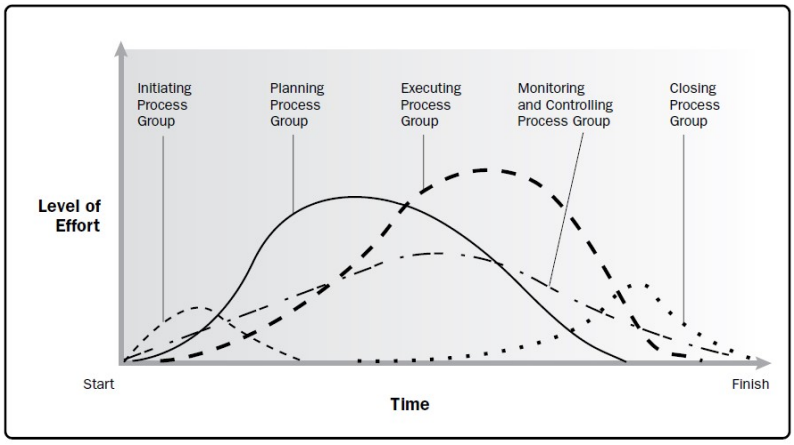

Fig 2.2: examples of process group interactions with a project or phase

Source: (PMBOK Guide 6th edition, 2017)

2.6 PROJECT MANAGEMENT KNOWLEDGE AREAS

The Project Management Knowledge Areas are fields or areas of specialization that are commonly employed when managing projects. A Knowledge Area is a set of processes associated with a particular topic in project management. These 10 Knowledge Areas are used on most projects most of the time. The needs of a specific project may require additional Knowledge Areas. The 10 Knowledge Areas are: *(PMBOK Guide 6th edition, 2017, pg 553)*

- **Project Integration Management.** Project Integration Management 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. *(PMBOK Guide 6th edition, 2017)*

  Project integration management involves coordinating all of the other project management knowledge areas throughout a project's life cycle. This integration ensures that all the elements of a project come together at the right times to complete a project successfully *(Schwalbe, 2016)*
- **Project Scope Management.** Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. *(PMBOK Guide 6th edition, 2017)*

  Project scope management includes the processes involved in defining and controlling what work is or is not included in a project *(Schwalbe, 2016)*
- **Project Schedule Management.** Project Schedule Management includes the processes required to manage the timely completion of the project.
- **Project Cost Management.** Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so the project can be completed within the approved budget.
- **Project Quality Management.** Project Quality Management 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' expectations.

- **Project Resource Management.** Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project.
- **Project Communications Management.** Project Communications Management includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project information.
- **Project Risk Management.** Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.
- **Project Procurement Management.** Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.
- **Project Stakeholder Management.** Project Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in and execution.

2.7 Empirical Literature Review

2.7.1 Project Management Practices (PMP)

The term' project management practice' is defined in several ways. Some authors associate it with project management competence and use it synonymously with demonstrable performance, while others refer to it as simply the use of project management tools and techniques on project activities. The term 'approaches' has also been used in the place of 'practice' but with the same interpretation. (*LAWANI*, A. and *MOORE, D., 2016)*. In addition, the term has been associated with the project management maturity model, suggesting that the level of continuity and capability of an organization in dealing with its projects strongly depends on project management practice. It is defined as a range of customs and rules or bodies of knowledge that state, clearly or implicitly, how the practitioner should operate or work in a certain situation. These practices can be written in documents stating best or preferred practice in the organization or are narratives demonstrating how things are done in the organization. it can also be stated that the use of tools and techniques is an indication of clearly informed bodies of knowledge, the use of processes indicates a range of customs and rules, and the use of personnel is the action of the practitioner. Therefore, for the current study, project management practice in a public organization is defined as a 'project management system demonstrating specific project management tools and techniques that enhanced management processes through the actions of a project manager or professional in order to support government organizations in managing public projects'.

2.7.2 PMP in Developing countries government organizations

In developing countries, the application of project management is still at an immature stage although the general awareness of the concept seems to permeate within various industries. One of the earliest citations of a study on project management in developing countries is that of *Stuckenbruck and Zomorrodian* in *1987*.Although no empirical investigation was conducted, the study suggested that plans for implementing project management in a developing country should take

into consideration cultural factors as well as its economic, political and administrative system. More than two decades later, the need for better understanding of project management practices in government institutions of developing countries remains. Project management is an effective approach for developing countries to use in improving their management capabilities and facilitate the successful completion of projects, thereby achieving developmental goals. However, research has identified that there is a lack of knowledge of project management techniques and tools, and insufficient time spent on reporting and controlling in certain context. Other findings, such as inadequate personnel qualifications, low level of project management competence, and identification of a lack of appropriate organization structure were reported following the assessment of the nature of project management practices in an infrastructure department in South Africa. The conclusion being that **most public organizations** in non-industrialized countries experienced **challenges** in project management practices *(Rwelamila 2007).* Similar research has been conducted in public organizations in West African countries and project management practices in this context seem to fall short in providing the expected benefits. In Ghana, *Ofori (2013)* argues that more emphasis should be placed on senior management commitment, competency and coordination in order to improve the quality of project management, while in Nigeria; *Olateju (2011)* identified a lack of in-depth knowledge of project management in public organizations amongst other factors affecting project management practice. (*LAWANI*, A. and *MOORE, D., 2016)*

2.8 Conceptual Frame Work

Following the above literature review, a conceptual model diagram for this research study is developed as shown on a fig below the ten project management knowledge areas are considered to understand the effect of project management practices in the corporation (revisit by:-researcher)

Fig 2.3: Conceptual model Diagram Source: Researcher

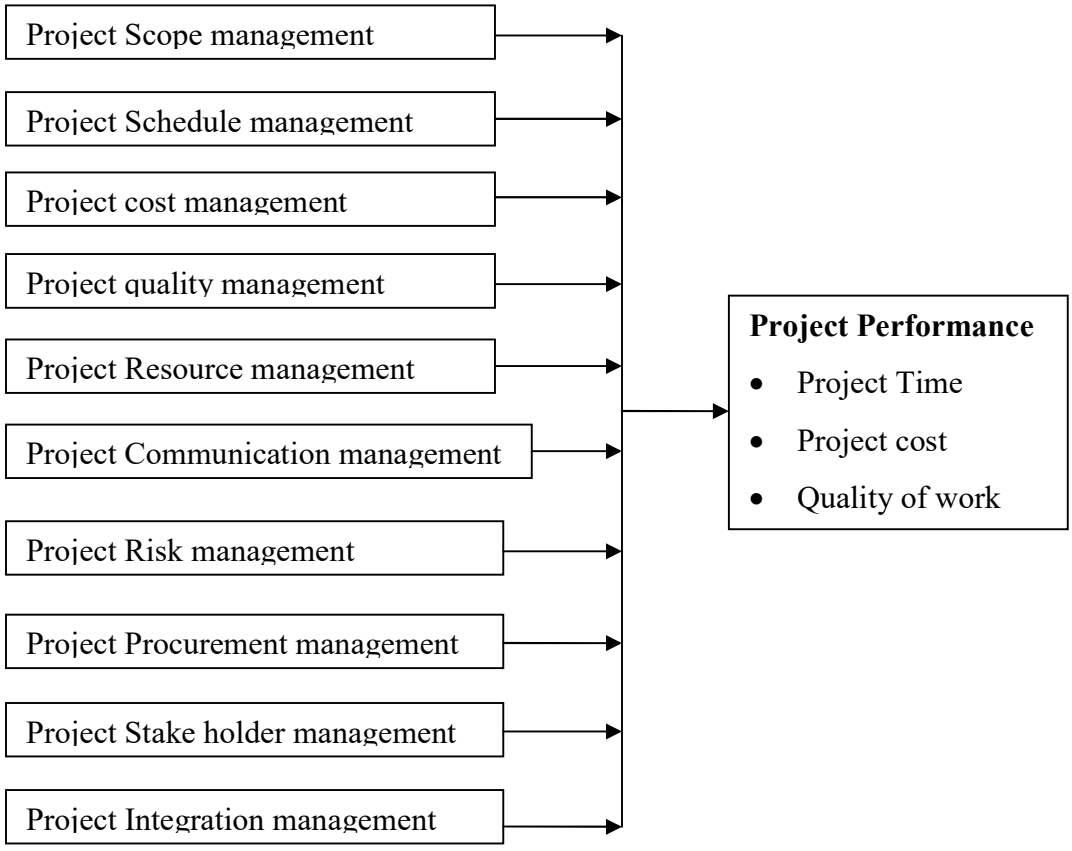

Table 2.1 Project management process group and knowledge area mapping

Source: (PMBOK Guide 6th edition, 2017)

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. 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
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

2.9 OVER VIEW OF RELATED STUDIES

I tried to overview the studies related to my titles on some level. The one study I found is that "Project management practices in government organizations of developing countries (DCGOs): a systematic review" by *LAWANI*, A. and *MOORE, D., 2016*. The main objective of the study was to puts forward an analysis of previous studies on Project management practices in Government Organizations of developing countries in order to provide useful insight into fundamental elements that influence project management practices. The research question the author raises are

1. What are the characteristics of previous studies on Project Management Practices in DCGOs?
2. What factors impact on Project Management Practices in DCGOs?

The study identified five categories of factors that impact on project management practices. Although, a majority of the studies highlighted a lack of project management skills, knowledge and competence as key factors, factors relating to contractor's inadequacy in project management knowledge, the internal process of public organizations, the climate of the organization and the project manager are identified also as important factors. The categories are; Climate of the Organization, Project management knowledge and Project manager expertise, internal control processes of the Organization and issues relating to the contractor.

The author conclude and recommend that Exploring the interaction between project practitioners, contextual dynamics and how tools and techniques are applied offered greater insight and explanation on the management of projects in diverse context.

2.10 Research Hypothesis

The hypothesis for this study is given below as;

1) **H0**=Project Integration Management does not significantly affect project performance
2) **H0**=Project scope Management does not significantly affect project performance

3) **H0**=Project schedule Management does not significantly affect project performance
4) **H0**=Project cost Management does not significantly affect project performance
5) **H0**=Project quality Management does not significantly affect project performance
6) **H0**=Project resource Management does not significantly affect project performance
7) **H0**=Project communication Management does not significantly affect project performance
8) **H0**=Project risk Management does not significantly affect project performance
9) **H0**=Project procurement Management does not significantly affect project performance
10) **H0**=Project stake holder Management does not significantly affect project performance

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Study Area & Period

The study is conducted in the organization ECDSWCO. This study focused on Effect of project management practices on Public enterprises' performance and the study has a plan to be prepared during January 15, 2024 and June, 2024.

3.2 Research Approach

The research approach for this study is quantitative research approach. Quantitative research is the process of collecting and analysing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

3.3 Research Design

The types of research designs employed for this study descriptive research designs. The descriptive research design is a research method that explores why something occurs when limited information is available. It can help us to increase your understanding of a given topic, ascertain how or why a particular phenomenon is occurring, and predict future occurrences. An Assessment was made on the effects of internal control towards mitigating fraud risk based on the implementation of focus points provided in relation with the study to collect the necessary data for the research.

3.4 Target population

In this study the targeted groups are the employees and managers working in the corporation under the Building and urban design and supervision works sector. Persons from Project managers, functional managers and all project related staffs are targeted in the study. A total population of 75 are targeted to involve through web based questionnaires. From the total of targeted population above, 37 are from building design sub process (all design teams under it), 19 are from supervision and contract administration sub process (all teams under it), 07 from urban design

sub process and 12 are from the project program management sub process (especially study design team and construction project management teams). All the departments above are the departments those who have a direct relation with projects under the sector. And the populations in those departments are targeted from employee to managerial positions.

The Sampling methods, which allows the researcher to study a relatively small number of units is representing the whole population Kaba, A.J (2009). Hence, this study applied a simplified formula provided by Yamane, taro (1967).

$$n = \frac{N}{1+N(e)2}.$$

Where" **n**" is the number of respondents (sample size),

"**N**" is the total number of employees in the corporation, **(285)**

"**e**" is the precision level. A 95% confidence level has to be taken and **e= 0.05**,

Thus, by dappling the given sample determination formula the researcher selected **75** Sample Respondent.

Corporation/sector/process	Total no of employee	Sample taken
sector	285	75

Table 3.1 sample employees *Source: ECDSWC. (2022)*

3.5 Sampling Design

The sampling is diversified from all age, sex, power status and ethnic groups. The target groups are from different departments working on projects and the composition of the sample is diversified to get the balanced and accurate result.

Therefore, the questionnaires are taken from four different sub processes named as building design sub process, supervision and contract administration sub process, urban design sub process and project program management sub process those which have a direct relation on the projects. From all departments the questionnaires are taken from the employees and managers.

Departments ▸ / ▾ Target groups	Building design sub process	Supervision & contract administration sub process	Project Program management sub process	Urban design sub process
Project members	16	7	4	1
Project coordinators	11	8	5	3
Project managers	10	4	3	3
Total No----75	**37**	**19**	**12**	**07**

Table 3.2 sample taken

Source: Researcher

3.6 Source of data

The main data source used in this study was primary data using questionnaire by gathering information directly from participants involved in the study, rather than relying on pre-existing data or secondary sources.

3.6.1 Primary Sources

The primary data sources included sources such as existing situations in the study area. Selected officials and experts especially from respective offices were the other data sources, which were collected, using primary data collection instruments such as questionnaires.

3.7 Method of Data Collection

The study used a primary source of data collection that is questionnaire for Managers, division heads, Coordinators, team leaders and other staff members to get the quantified results. A total of 75 questionnaires were distributed to Managers, division heads, Coordinators, team leaders and other staff members. A questionnaire prepared for the selected sample population in order to gather the necessary data needed to conduct the research.

3.8 Data Analysis Methods

The quantitative data collected in this study are analyzed using descriptive statistics such as frequencies, percentage and mean values. The qualitative data was also collected using five-point Likert scale; (5) strongly agree, (4) agree, (3)

neither, (2) disagree and (1) strongly disagree. Similarly, it was used that the five point likert scale for the effect on the performance of the project as follows: (5) always, (4) frequently, (3) sometimes, (2) seldom and (1) neither.

The first-hand questionnaires collected from respondents were first checked to detect any missing questionnaires and each questionnaire was sorted with a unique number. After the checking and sorting process is completed, each questionnaire's response is analyzed by using SPSS version 23 and the result is presented by using tabulation, descriptive statistics, frequencies, Percentage mean, and standard deviation. Certain variables were tested using inferential statistics such as correlation coefficient and regression.

3.8.1 Model specification

As shown in the conceptual framework this study assumed that project performance has an association with, project integration, scope, schedule, cost, quality, resource, communication, risk, procurement and stake holder management (Fig 2.3). The model for the study that depicted project management practices that affect project performance of ECDSWCo (BUDSWS) is formulated as follow:

$Yi = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3\ X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \beta 7X7 + \beta 8X8 + \beta 9X9 + \beta 10X10 + Ui$

Where

Y is the dependent project performance,

X1 = project integration Management,

X2 = project scope Management,

X3 = project schedule Management,

X4 = project cost Management,

X5 = project quality Management,

X6 = project resource Management,

X7 = project communication Management,

X8 = project risk Management,

X9 = project procurement Management,

X10= project stake holder Management are the independent variables;

β0 is the intercept, β1, β2, β3, β4, β5, β6, β7, β8, β9 and β10 are also referring to the coefficient of their respective independent variables, Ui = the error term

The multiple linear regression models were specified for hypotheses H0 and H1; as shown below. For -the association assumed in

H0: There is no significant association between the dependent variable (Project performance) and the independent variables (project integration, scope, schedule, cost, quality, resource, communication, risk, procurement and stake holder management).

H1: There is a significant association between the dependent and the independent variables

3.9 Validity and reliability Analysis

3.9.1 Validity

Validity means as the extent to which a concept is accurately measured in a quantitative study.

3.9.2 Reliability

It is another aspect considered in research to ensure that measuring instrument provides consistent result

Reliability is related to internal consistency, which refers to how different questions or statements measure the same characteristic

For the reliability test, the researcher used Cronbach's Alpha. Cronbach's alpha is a measure to be used to assess the reliability, or internal consistency, of a set of scale or test items for the study.

3.10 Variable description

3.10.1 Dependent variables

Project Performance: is the performance of the sector in terms of the following constraints which is a dependent variable

- Project Time
- Project cost
- Quality of work...

3.10.2 Independent variables

The current practices of the ten project management knowledge areas of project management frame work. The ten project management knowledge areas are as follows

- Project integration management practices
- Project scope management practices
- Project schedule management practices
- Project cost management practices
- Project quality management practices
- Project resource management practices
- Project communication management practices
- Project risk management practices
- Project procurement management practices
- Project stake holder management practices

3.11 Research ethics

The data collection asked from the concerned bodies through the questionnaire which is prepared in English. Before requesting the primary sources through the questionnaires, we explained the purpose of the questionnaires and based on written informed consent and permission of the participants, they assured of confidentiality for all information they provided.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

This chapter covers the data analysis, presentation and discussion of the findings of the research studies. It covers the response rate, demographic information and the findings of the research objectives.

4.1 Response rate

The web-based questionnaires were sent to the total of 85 respondents. From these respondents 75 out of 85 have filled the questionnaires and give response. 10 out of 85 didn't respond for the questionnaire that was given to them. It is summarized on the table below. So, the study uses the data collected from 75 respondents those who have 88.2% rate and successfully responded.

Response status	Frequency	Percentage (%)
Responded	75	88.2%
Not Responded	10	11.8%
Total	85	100%

Table 4.1 Response Rate Source: Survey result 2024

4.2 Demographic information of the respondents

This section covers the demographic information of the respondents like gender distribution, age group, level of education, work place, and job category and work experience in the ECDSWCo projects.

The Gender distribution consists 28% of the respondents from females and the rest 72% from males and the age distribution the majority of the respondents are from the age group in b/n 30-39 which take the higher percentage of 65.3%, in the second 40-49 age groups take the major share. Almost 98.7% of the respondents are above 30 age groups those which are on the adultery age group and working groups. Only one person is in the range of young group

The minimum level (requirement) of education for the staffs those which are involving and working on projects at ECDSWCo is bachelor degree. As per our survey of the respondents' level of education all respondents have bachelor and master's degree, which are 46.7% and 53.3% respectively.

As we discussed before the ECDSWCo's building and urban design and supervision works sector has three core processes and two supporting service centers. So the above three core processes have a direct involvement on projects. The survey is taken from the sub processes under the three core processes which have scored the frequencies and percentage as shown on the table

The distribution of respondents by job category is based on their role on projects from project members to project managers in the sector. Based on the result on the survey below on the table 26.6% of respondents are project coordinators, 29.4 are project managers and the rest 44% are project members those who are involved on the projects. So all the respondents are aware of project management and have a clue on the project management practices.

As it is also shown on the table below, we have got a diversified work experience of respondents on the sector. The survey data indicated that 21.3% have 0-5yrs; 26.7% have 6-10yrs; 30.7 have 11-15yrs and 21.3% have above 16yrs of experience on the corporation. Work experience on the corporation helps to know more about the corporations' project management practices.

Demography	**Categories**	**Frequency**	**(%)**
sex	Female	21	28.0%
	male	54	72.0%
	Total	**75**	**100**
age group	18-29	1	1.3%
	30-39	49	65.3%
	40-49	20	26.7%
	above 50	5	6.7%
	total	**75**	**100**
level of education	masters degree	40	53.3%
	undergraduate degree	35	46.7%
	total	**75**	**100**
work place	Building design sub process	37	49.3%

	Project program management sub process	12	16.0%
	Supervision and contract administration	19	25.3%
	Urban design sub process	7	9.3%
	total	**75**	**100**
Your Job category	Project coordinator	19	25.3%
	Project manager	22	29.3%
	project member	33	44.0%
	Support staff	1	1.3%
	total	**75**	**100**
Work experience on ECDSWCo projects?	0-5yrs	16	21.3%
	11-15yrs	23	30.7%
	6-10yrs	20	26.7%
	above 16yrs	16	21.3
	total	**75**	**100**

Table 4.2 Summary of demographic information

Source: Survey result 2024

4.3 Descriptive statistics Analysis of project management practices in terms of PMBOK

This section covered the Descriptive statistics analysis of project management practices of the sector based on the surveyed data in terms of the ten project management knowledge areas of project management. The study sought to determine the extent to which the respondents agree or disagree on practices of project management processes in terms of the ten project management area.

The responses were rated on five point likert scale where: 5=strongly, 4=agree, 3 neutral, 2= disagree and 1= strongly disagree.

Here under are discussed the project management practices of the sector in terms of the 10 PMBOk areas based on the surveyed data collected.

4.3.1 Project management practices

	N	Mean	Std. Dev	Rank
Project Integration management	75	3.5995	.50571	6th
Project scope management	75	3.5523	.56415	7th
Project schedule management	74	3.9049	.66116	1st
Project cost management	75	2.5067	1.00503	10th
Project quality management	75	3.3733	.95540	8th
Project resource management	75	3.7244	.62305	3rd
Project communication management	75	3.6943	.65057	4th
Project risk management	75	3.3724	.65527	9th
Project procurement management	75	3.7492	.68975	2nd
Project stakeholder management	75	3.6870	.72433	5th

Table 4.3 current practice of the sector on project management

Source: Survey result 2024

4.3.2 Project integration management

In this section of project integration management survey, the respondents were asked about the current practice of the sector on project integration management and the effect of the integration management on projects around 15 questions.

According to the findings on the table below, the average mean value of 3.6 out of 5 was scored for an average of all process group asked. The maximum mean value was given 4.65 and a minimum value of 2.99 was scored.

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Project charter was developed for projects	75	8	10.7	18	24.0	23	30.7	17	22.7	9	12.0	2.99
2	Project management plan was developed for projects	75	11	14.7	24	32.0	18	24.0	20	26.7	2	2.7	3.29

3	Project activities were managed and directed as defined in the project management plans	75	7	9.3	19	25.3	28	37.3	17	22.7	4	5.3	3.11
4	Project knowledge areas was managed	74	4	5.3	22	29.3	21	28.0	23	30.7	4	5.3	2.99
5	Work monitoring was practiced	75	8	10.7	29	38.7	25	33.3	10	13.3	3	4.0	3.39
6	Change control was carried out to manage all change requests	75	7	9.3	22	29.3	23	30.7	21	28.0	2	2.7	3.15
7	Project closure is carried out to formally complete a project or phase	73	6	8.0	24	32.0	15	20.0	20	26.7	8	10.7	3.00
8	Experienced project manager assigned to manage the integration management	75	5	6.7	23	30.7	26	34.7	12	16.0	9	12.0	3.04
9	Not preparing the project charter can affect the project performance with time, quality and scope	75	38	50.7	29	38.7	5	6.7	0	0	3	4.0	4.32
10	If project management plan is not prepared, do you think, can it affect the performance of the organization to accomplish projects within the scope, time and budget	75	50	66.7	20	26.7	1	1.3	1	1.3	3	4.0	4.51
11	If project management plan is not prepared, can the organization meet the projects with in quality, time and scope/	75	7	9.3	12	16.0	4	5.3	26	34.7	26	34.7	2.31
12	Managing project knowledge areas helps for the completion of projects with in time, budget and scope	75	41	54.7	27	36.0	5	6.7	0	0	2	2.7	4.43

13	Assigning of experienced project manager have a positive effect on project integration management and the performance of the corporation/sector/ on projects	72	44	58.7	22	29.3	3	4.0	0	0	3	4.0	4.44
14	Change in scope affect the timely completion of the project	74	53	70.7	18	24.0	2	2.7	0	0	1	1.3	4.65
15	Lack of good integration management can negatively affect the performance of the organization or corporation on projects to accomplish with time, budget and scope	75	44	58.7	26	34.7	1	1.3	2	2.7	2	2.7	4.44
	Average Mean												**3.6**

Table 4.4 current practice of the sector on project integration management

Source: Survey result 2024

4.3.3 Project Scope management

In the survey of project scope management questionnaires, the respondents were asked about the current practice of the sector on project scope management and the effect of the scope management on projects around 14 questions.

According to the findings on the table below, the average mean value of 3.56 out of 5 was scored for an average of all process group asked. The maximum mean value was given 4.51 and a minimum value of 2.32 was scored

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Scope management plan was developed	75	9	12.0	23	30.7	23	30.7	19	25.3	1	1.3	3.27
2	Project requirements were developed	75	7	9.3	29	38.7	24	32.0	14	18.7	1	1.3	3.36
3	Work breakdown structure was developed	75	11	14.7	28	37.3	22	29.3	12	16.0	2	2.7	3.45
4	Completed project deliverables were validated"	75	9	12.0	31	41.3	27	36.0	7	9.3	1	1.3	3.53
5	Scope changes were controlled and evaluated to the scope baselines	75	4	5.3	23	30.7	24	32.0	21	28.0	3	4.0	3.05
6	Experienced project manager assigned to manage the project scope management	75	9	12.0	20	26.7	25	33.3	18	24.0	3	4.0	3.19
7	Not preparing the scope management plan can affect the performance of the corporation/sector/ to accomplish the projects with in time, quality and scope.	75	31	41.3	35	46.7	3	4.0	3	4.0	3	4.0	4.17
8	If project requirements is not developed, do you think, can it affect the performance of the organization to accomplish the project with in time, quality and scope	75	28	37.3	41	54.7	3	4.0	0	0	3	4.0	4.21
9	If Project scope is not defined, can the organization meet the quality, time and scope aspect of the project?	74	8	10.7	14	18.7	4	5.3	16	21.3	32	42.7	2.32

10	If WBS is not developed, can the corporation/Sector/ meet the quality, time and scope aspect of the project?	74	7	9.3	10	13.3	14	18.7	27	36.0	16	21.3	2.53
11	Validating Completed project deliverables can affect the performance of projects	73	13	17.3	34	45.3	14	18.7	10	13.3	2	2.7	3.63
12	Assigning of experienced project manager have a positive effect on the project scope management and performance of the corporation on projects	75	39	52.0	27	36.0	4	5.3	2	2.7	3	4.0	4.29
13	Change in scope affect the timely completion of the project	74	44	58.7	27	36.0	1	1.3	1	1.3	1	1.3	4.51
14	Lack of good project scope management can negatively affect the performance of the corporation/sector/ on projects to accomplish with time, budget and scope	75	36	48.0	35	46.7	2	2.7	1	1.3	1	1.3	4.39
Average Mean													**3.56**

Table 4.5 current practice of the sector on project scope management

Source: Survey result 2024

4.3.4 Project Schedule management

In this section of project schedule management survey, the respondents were asked about the current practice of the sector on project schedule management and the effect of the schedule management on projects around 11 questions.

According to the findings on the table below, the average mean value of 3.9 out of 5 was scored for an average of all process group asked. The maximum mean value was given 4.37 and a minimum value of 3.05 was scored

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Schedule management plan was developed	74	14	18.7	36	48.0	11	14.7	0	0	13	17.3	3.69
2	List of activities were defined	74	15	20.0	35	46.7	12	16.0	10	13.3	2	2.7	3.69
3	Sequence of project activities were identified	73	13	17.3	37	49.3	12	16.0	10	13.3	1	1.3	3.70
4	Duration needed to complete activities with resource were estimated	74	12	16.0	34	45.3	17	22.7	8	10.7	3	4.0	3.59
5	Baseline project schedule was developed	74	10	13.3	38	50.7	14	18.7	11	14.7	1	1.3	3.61
6	Changes to the baseline project schedule were monitored and evaluated	74	7	9.3	20	26.7	22	29.3	20	26.7	5	6.7	3.05
7	Not preparing the schedule management plan can affect the performance of the corporation/sector/ to accomplish the projects with in time.	73	38	50.7	28	37.3	3	4.0	2	2.7	2	2.7	4.34
8	If list of activities is not defined, do you think, can it affect the performance of the organization to accomplish the project with in time?	74	33	44.0	32	42.7	6	8.0	1	1.3	2	2.7	4.26

9	Assigning of experienced project manager have a positive effect on the project schedule management and performance of the corporation/sector/ on projects	73	40	53.3	25	33.3	5	6.7	1	1.3	2	2.7	4.37
10	If Changes to the baseline project schedule were not monitored and evaluated, can it affect the timely completion of the project	74	32	42.7	37	49.3	3	4.0	1	1.3	1	1.3	4.32
11	Lack of good project schedule management can negatively affect the performance of the corporation/sector/ on projects to accomplish with time.	74	37	49.3	31	41.3	2	2.7	2	2.7	2	2.7	4.34
Average Mean													3.9

Table 4.6 current practice of the sector on project schedule management

Source: Survey result 2024

4.3.5 Project Cost management

In this section of project cost management survey, the respondents were asked about the current practice of the sector on project cost management and the effect of the cost management on projects around 9 questions.

According to the findings on the table below, the average mean value of 3.9 out of 5 was scored for an average of all process group asked. The maximum mean value was given 4.42 and a minimum value of 3.11 was scored

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Project cost management policies and guidelines were developed	74	8	10.7	21	28.0	22	29.3	17	22.7	6	8.0	3.11
2	Cost needed to complete the project work was estimated	74	15	20.0	33	44.0	12	16.0	10	13.3	4	5.3	3.61
3	Project budget was determined to establish authorized cost base line	74	9	12.0	35	46.7	18	24.0	8	10.7	4	5.3	3.50
4	Project cost changes were monitored and managed	74	9	12.0	29	38.7	16	21.3	18	24.0	2	2.7	3.34
5	Not preparing the Cost management plan can affect the performance of the corporation/sector/ to accomplish the projects within budget.	73	34	45.3	29	38.7	6	8.0	3	4.0	1	1.3	4.26
6	If Cost needed to complete the project work is not estimated, do you think, can it affect the performance of the organization to accomplish the project within Budget?	74	28	37.3	37	49.3	5	6.7	2	2.7	2	2.7	4.18

7	Assigning of experienced project manager have a positive effect on the project cost management and performance of the corporation/sector/ on projects	74	35	46.7	32	42.7	5	6.7	0	0	2	2.7	4.32
8	If Project cost changes were not monitored and evaluated, can it affect the completion of the project within budget?	74	39	52.0	29	38.7	5	6.7	0	0	1	1.3	4.42
9	Lack of good project Cost management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the budget.	74	34	45.3	36	48.0	2	2.7	1	1.3	1	1.3	4.36
Average Mean													3.9

Table 4.7 current practice of the sector on project cost management

Source: Survey result 2024

4.3.6 Project Quality management

In this section of project quality management survey, the respondents were asked about the current practice of the sector on project quality management and the effect of the quality management on projects around 7 questions.

According to the findings on the table below, the average mean value of 3.87 out of 5 was scored for an average of all process group asked. The maximum mean value was given 3.27 and a minimum value of 4.23 was scored

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Quality management plan was developed	74	5	6.7	36	48.0	21	28.0	8	10.7	4	5.3	3.41
2	The quality standards were translated into executable quality activities	74	8	10.7	24	32.0	26	34.7	12	16.0	4	5.3	3.27
3	Quality standards were controlled to asses performance and ensure project deliverables	74	13	17.3	31	41.3	18	24.0	9	12.0	3	4.0	3.57
4	Not preparing the Quality management plan can affect the performance of the corporation/sector/ to accomplish the projects within the standard quality.	73	29	38.7	37	49.3	3	4.0	0	0	3	4.0	4.23
5	If The quality standards are not translated into executable quality activities, do you think, can it affect the performance of the organization to accomplish the project within the quality?	73	25	33.3	39	52.0	7	9.3	1	1.3	1	1.3	4.18
6	Assigning of experienced project manager have a positive effect on the project quality management and performance of the corporation/sector/ on projects	73	33	44.0	30	40.0	6	8.0	2	2.7	2	2.7	4.23

7	Lack of good project quality management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the required quality.	74	30	40.0	37	49.3	3	4.0	2	2.7	2	2.7	4.23
Average Mean													3.87

Table 4.8 current practice of the sector on project quality management

Source: Survey result 2024

4.3.7 Project Resource management

Project resource management is one of the knowledge areas of project management that was considered in this study to collect data. There are eleven questions to identify the practice of the project resource management on the sector and the effect of project resource management practices on project performance.

According to the findings on the table below, the average mean value of 3.72 out of 5 was scored for an average of all process group asked. The maximum mean value was given 3.12 and a minimum value of 4.25 was scored

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Resource management plan was developed	75	5	6.7	29	38.7	21	28.0	16	21.3	4	5.3	3.20
2	Material and human resources were estimated necessary to perform project work	75	8	10.7	33	44.0	15	20.0	16	21.3	3	4.0	3.36
3	Resource required to complete project work were obtained	74	8	10.7	30	40.0	20	26.7	13	17.3	3	4.0	3.36
4	Team were developed to enhance performance	75	9	12.0	40	53.3	16	21.3	8	10.7	2	2.7	3.61

5	Tracking team performance and managing team changes were carried out.	75	5	6.7	28	37.3	27	36.0	13	17.3	2	2.7	3.28
6	Resources were monitored and controlled to ensure they are available	75	4	5.3	26	34.7	26	34.7	13	17.3	6	8.0	3.12
7	Not preparing the resource management plan can affect the performance of the corporation/sector/ to accomplish the projects within the budget.	75	26	34.7	39	52.0	6	8.0	3	4.0	1	1.3	4.15
8	If The resources are not monitored and controlled to ensure they are available, do you think, can it affect the performance of the organization to accomplish the project within the budget?	75	28	37.3	41	54.7	4	5.3	1	1.3	1	1.3	4.25
9	If the team changes are not carried out on time, do you think, can it affect the performance of the organization to accomplish the project within the time and budget?	73	28	37.3	34	45.3	8	10.7	2	2.7	1	1.3	4.18
10	Assigning of experienced project manager have a positive effect on the project resource management and performance of the corporation/sector/ on projects	75	32	42.7	33	44.0	6	8.0	2	2.7	2	2.7	4.21

11	Lack of good project resource management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the required budget.	75	33	44.0	35	46.7	3	4.0	2	2.7	2	2.7	4.27
Average Mean													3.72

Table 4.9 current practice of the sector on project resource management

Source: Survey result 2024

4.3.8 Project Communication management

The other knowledge area of project management which was surveyed on the sector is Project communication management and it was considered in this study to collect data. There are seven questions to identify the practice of the project communication management on the sector and the effect of project communication management practices on project performance.

According to the findings on the table below, the average mean value of 3.69 out of 5 was scored for an average of all process group asked. The maximum mean value was given 4.29 and a minimum value of 2.95 was scored.

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Project communication guide lines were developed	74	5	6.7	16	21.3	30	40.0	16	21.3	7	9.3	2.95
2	Timely and appropriate collection, distribution and disposition of information were managed.	75	5	6.7	20	26.7	24	32.0	22	29.3	4	5.3	3.00
3	Information needs of the project and its stakeholders met.	74	6	8.0	24	32.0	27	36.0	14	18.7	3	4.0	3.22

4	Not preparing the Communication management guide lines can affect the performance of the corporation/sector/ to accomplish the projects within the given time.	75	20	26.7	44	58.7	4	5.3	4	5.3	3	4.0	3.99
5	If Timely and appropriate collection, distribution and disposition of information is not managed, do you think, can it affect the performance of the organization to accomplish the project within the given time?	75	24	32.0	42	56.0	6	8.0	2	2.7	1	1.3	4.15
6	Assigning of experienced project manager have a positive effect on the project communication management and performance of the corporation/sector/ on projects	74	36	48.0	29	38.7	5	6.7	1	1.3	3	4.0	4.27
7	Lack of good project communication management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the given time.	75	32	42.7	36	48.0	5	6.7	1	1.3	1	1.3	4.29
Average Mean													3.69

Table 4.10 current practice of the sector on project communication management

Source: Survey result 2024

4.3.9 Project Risk management

In this section of project risk management there are 12 questions to identify the practice of the risk management & its effect on project performance.

According to the findings on the table below, the average mean value of 3.37 out of 5 was scored for an average of all process group asked. The maximum mean value was given 4.20 and a minimum value of 2.51 was scored

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Risk management plan was developed	75	4	5.3	9	12.0	23	30.7	24	32.0	15	20.0	2.51
2	Project risk was identified	75	4	5.3	14	18.7	21	28.0	24	32.0	12	16.0	2.65
3	Risk analysis were performed to identify the effect on the project	75	4	5.3	16	21.3	20	26.7	23	30.7	12	16.0	2.69
4	Risk response strategy to address project risk were developed	75	3	4.0	14	18.7	18	24.0	28	37.3	12	16.0	2.57
5	Agreed upon risk responses were implemented	75	3	4.0	12	16.0	26	34.7	26	34.7	8	10.7	2.68
6	The implementation of risk responses were monitored	74	4	5.3	11	14.7	22	29.3	29	38.7	8	10.7	2.65
7	Not preparing the Risk management Plan can affect the performance of the corporation/sector/ to accomplish the projects within the given time.	73	24	32.0	36	48.0	8	10.7	4	5.3	1	1.3	4.07

8	If Project risk is not identified, do you think, can it affect the performance of the organization to accomplish the project within the given time?	75	26	34.7	39	52.0	7	9.3	1	1.3	2	2.7	4.15
9	If Project risk analysis is not Performed and identified its effect on projects, do you think, can it affect the performance of the organization to accomplish the project within the given time?	74	26	34.7	36	48.0	7	9.3	4	5.3	1	1.3	4.11
10	If Project Risk response strategy to address project risk is not developed, do you think, can it affect the performance of the organization to accomplish the project within the given time?	74	22	29.3	41	54.7	6	8.0	4	5.3	1	1.3	4.07
11	Assigning of experienced project manager have a positive effect on the project risk management and performance of the corporation/sector/ on projects	74	31	41.3	32	42.7	6	8.0	2	2.7	3	4.0	4.16
12	Lack of good project risk management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the given time.	75	32	42.7	33	44.0	5	6.7	3	4.0	2	2.7	4.20
Average Mean													3.37

Table 4.11 current practice of the sector on risk management

Source: Survey result 2024

Project Procurement management

In this section, there are 8 questions to identify the practice of the procurement management on the sector & its effect on project performance. According to the findings on the table below, the average mean value of 3.74 was scored. The maximum mean value was given 4.24 and a minimum value of 3.01 was scored.

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Project procurement plan were developed	74	6	8.0	22	29.3	20	26.7	21	28.0	5	6.7	3.04
2	Procurement activities conducted as per the plan	74	6	8.0	20	26.7	23	30.7	19	25.3	6	8.0	3.01
3	Procurement relationships were managed	74	4	5.3	19	25.3	31	41.3	16	21.3	4	5.3	3.04
4	Not preparing the Procurement management Plan can affect the performance of the corporation/sector/ to accomplish the projects within the given time.	75	30	40.0	33	44.0	6	8.0	4	5.3	2	2.7	4.13
5	If Procurement activities are not conducted as per the plan, do you think, can it affect the performance of the organization to accomplish the project within the given time?	75	26	34.7	38	50.7	7	9.3	3	4.0	1	1.3	4.13
6	If Procurement relationships are not managed, do you think, can it affect the performance of the organization to accomplish the project within the given time?	75	28	37.3	36	48.0	6	8.0	3	4.0	2	2.7	4.13

7	Assigning of experienced project manager have a positive effect on the project Procurement management and performance of the corporation/sector/ on projects	75	34	45.3	31	41.3	5	6.7	3	4.0	2	2.7	4.23
8	Lack of good project Procurement management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the given time.	75	29	38.7	40	53.3	2	2.7	3	4.0	1	1.3	4.24
Average Mean													3.74

Table 4.12current practice of the sector on project procurement management

Source: Survey result 2024

4.3.10 Project Stake holder management

The last but not the list, project stake holder management is also a mandatory and has an effect on the performance of projects. If it is not properly managed, it has an impact on the performances of the projects. In this section of project procurement management there are eight questions to identify the practice of the project stake holder management on the sector and the effect of project stake holder management practices on project performance.

According to the findings on the table below, the average mean value of 3.68 out of 5 was scored for an average of all process group asked. The maximum mean value was given 4.23 and a minimum value of 2.95 was scored.

Five point likert scale			Strongly agree		agree		neutral		disagree		Strongly disagree		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Project stake holders were identified	75	13	17.3	36	48.0	10	13.3	13	17.3	3	4.0	3.57
2	Stakeholder engagement plan was developed	75	6	8.0	19	25.3	20	26.7	25	33.3	5	6.7	2.95

3	Active communication with stakeholders were done to ensure their engagement	75	8	10.7	24	32.0	23	30.7	18	24.0	2	2.7	3.24
4	Stakeholders' relationships were monitored and managed	74	6	8.0	19	25.3	24	32.0	21	28.0	4	5.3	3.03
5	Not preparing the stake holder engagement Plan can affect the performance of the corporation/sector/ to accomplish the projects within the scope.	74	28	37.3	34	45.3	6	8.0	3	4.0	3	4.0	4.09
6	If Active communications with stakeholders are not done to ensure their engagement, do you think, can it affect the performance of the organization to accomplish the project within the required scope?	74	29	38.7	36	48.0	6	8.0	1	1.3	2	2.7	4.20
7	Assigning of experienced project manager have a positive effect on the project stake holder management and performance of the corporation/sector/ on projects	74	30	40.0	33	44.0	8	10.7	1	1.3	2	2.7	4.19
8	Lack of good project stake holder management can negatively affect the performance of the corporation/sector/ on projects to accomplish within the scope.	75	30	40.0	36	48.0	6	8.0	2	2.7	1	1.3	4.23
Average Mean													3.68

Table 4.13 current practice of the sector on project stake holder management

Source: Survey result 2024

4.3.11 Assessments of sector's project performance indicators

The last section of the descriptive analysis aimed to assess the project performance of the sector in terms of completion of projects with in time, budget, and set of standards. Around 75 respondents reacted on those questionnaires and gave their responses. The rating was based on likert scale of 1-5: where 5=always, 4=frequently,3= sometimes,2=seldom and 1= never. Here under are discussed the project performance of the sector based on the surveyed result.

According to the findings on the table above, the average mean value of 2.76 out of 5 was scored for an average of all performances asked. The maximum mean value was given 3.37 and a minimum value of 2.40 was scored.

Five point likert scale			Always		frequently		sometimes		seldom		Never		Mean
no	Given Value		5		4		3		2		1		
	Factor Element	N	#	%	#	%	#	%	#	%	#	%	
1	Projects Completed within planned schedule	75	3	4.0	6	8.0	20	26.7	35	46.7	11	14.7	2.40
2	Project Completed within the budget	75	2	2.7	12	16.0	18	24.0	33	44.0	10	13.3	2.51
3	Project Completed within the set of standard(quality)	75	7	9.3	31	41.3	21	28.0	15	20.0	1	1.3	3.37
Average Mean													2.76

Table 4.14 project performance indicators of the sector

Source: Survey result 2024

4.4 Analysis for Reliability (internal consistency) and its Test Result

A Cronbach's alpha can be calculated as:

$$\alpha = \frac{k \times \bar{c}}{\bar{v} + (k-1)\bar{c}}$$

Where: **K** refers to the number of scale items

$\bar{C}$ refers to the average of all covariance between items

$\bar{V}$ refers to the average variance of each item

According to Bryman,A and Bell, E (2007), reliability analysis is concerned with the internal consistency of the research instrument. As multiple items in all constructs were used, the internal consistency of all variables that affect project performance was assessed with Cronbach's Alpha and the reliability values for all constructs are confirmed as greater than 0.7(α=0.891), which are considered acceptable. The following table shows the summary of reliabilities of all constructs and items related to each construct

Reliability Statistics	
Cronbach's Alpha	N of Items
.891	10

Table 4.15 Reliability (internal consistency) *Source: Survey result 2024*

Based on the Cronbach's alpha results if each item is deleted, it appears that all of the items contribute positively to the internal consistency reliability of the measurement instrument. The Cronbach's alpha values ranging from 0.867 to 0.917 indicate high internal consistency among the items measuring different aspects of project management practices. This suggests that the items within each construct are consistently measuring the intended aspect of project management.

Items	Cronbach's Alpha if Item Deleted
Integration management	.881
scope management	.876
schedule management	.876
cost management	.917
quality management	.911
resource management	.868
communication management	.867
risk management	.871
procurement management	.867
stakeholder management	.870

Table 4.16 summaries of reliabilities of all constructs and items related to each construct *Source: Survey result 2024*

4.5 Test for Normality of Data

The normal probability plot (Chambers et al., 1983) is a graphical technique for assessing whether or not a data set is approximately normally distributed. The data are plotted against a theoretical normal distribution in such a way that the points should form an approximate straight line. Departures from this straight line indicate departures from normality

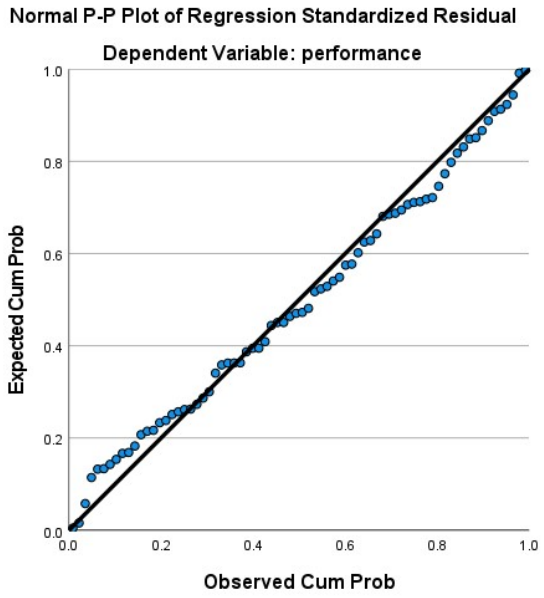

Fig 4.1: test for normality

Source: Survey result 2024

From fig 4.1 above we understood that residuals of the model are approximately normally distributed, because the strait line seems to fit the data reasonably well.

4.5.1 Test for multi-co-linearity

Another assumption that has to be mate to undertake multiple linear regression models is the assumption of multi-co-linearity which seriously affects the parameter estimates. According to Gujarati,D and Poter D (2003), multi-co-linearity refers to a situation where it becomes difficult to identify the separate effect of independent variables on the dependent variable because of existing

strong relationship among them. In other words, multi-co-linearity is a situation where explanatory variables are highly correlated. Two measures are often recommended to test the existence of multi-co-linearity. These are Variance Inflation Factor (VIF) for association among the continuous explanatory variables and Contingency Coefficients (CC) for dummy or discrete variables. The decision rule is a variable whose VIF value is greater than 10 indicates the possible existence of multi-co-linearity problem. Tolerance (TOL) defined as 1/VIF, It also used by many researchers to check on the degree of co linearity. The decision rule for Tolerance is a variable whose TOL value is less than 0.1 shows the possible existence of multi-co-linearity problem (Gujarati D.N, 2004).

Model	Co linearity Statistics	
	Tolerance	VIF
Integration management	.413	2.423
scope management	.310	3.225
schedule management	.225	4.439
cost management	.619	1.616
quality management	.652	1.535
resource management	.129	7.770
communication management	.165	6.059
risk management	.228	4.385
procurement management	.172	5.814
stakeholder management	.232	4.312
Dependent Variable: Project performance		

Table 4.17 test of Multi-co-linearity

Source: Survey result 2024

Table 4.17 above displayed that VIF values for all variables became less than 10. Moreover, Tolerance values of all variables are above 0.1, which indicates that this model is free from the multi-co linearity problem.

4.5.2 Test of Independent of Residuals

Multiple linear regression models assume the residuals are independent of one another. The Durbin-Watson statistic is used to test for the presence of serial correlation among the residuals. The value of the Durbin-Watson statistic ranges from 0 to 4. As a rule, the residuals are not correlated if the Durbin-Watson statistic is approximately two, and an acceptable range is 1.50 - 2.5 from table 4.18 below, we can also understand that the assumption of independence of residuals is satisfied.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.971[a]	.942	.933	.21412	1.775

- Predictors: (Constant), stakeholder management, quality management, cost management, integration management, schedule management, risk management, scope management, communication management, procurement management, resource management.
- Dependent Variable: project performance

Table 4.18 test of independent variables

Source: Survey result 2024

4.5.3 Test for the Existence of Outliers

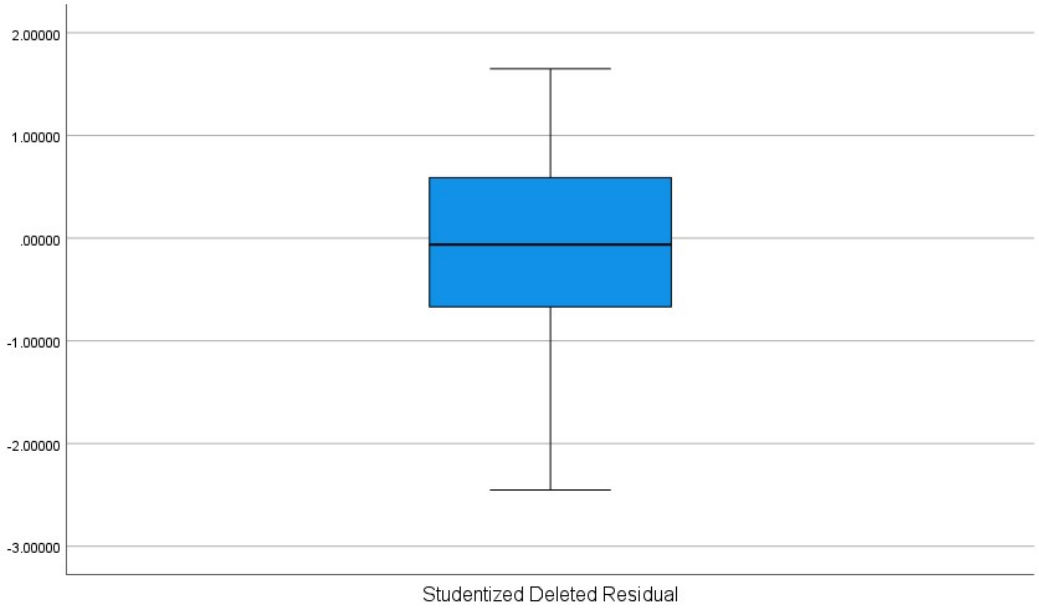

Fig 4.2: test for the existence of outliers

Source: Survey result 2024

If there are no circles or asterisks on either side of the box plot, it is an indication of on outliers are present. Therefore as depicted on Fig.4.2 above, there are no outliers

4.5.4 Results of Regression Model

The model for the study that depicted project management dimensions that affect project performance of ECDSWCo.

$Yi = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3\ X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \beta 7X7 + \beta 8X8 + \beta 9X9 + \beta 10X10 + Ui$

Where

Y is the dependent project performance,

X1 = project integration Management,

X2 = project scope Management,

X3 = project schedule Management,

X4 = project cost Management,

X5 = project quality Management,

X6 = project resource Management,

X7 = project communication Management,

X8 = project risk Management,

X9 = project procurement Management,

X10= project stake holder Management are the independent variables;

β0 is the intercept , β1, β2, β3, β4, β5, β6, β7, β8, β9 and β10 are also referring to the coefficient of their respective independent variables , Ui = the error term

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.274	10	4.727	103.109	.000[b]
	Residual	2.888	63	.046		
	Total	50.162	73			

- Predictors: (Constant), stakeholder management, quality management, cost management, integration management, schedule management, risk management, scope management, communication management, procurement management, resource management.
- Dependent Variable: project performance

Table 4.19 ANOVA Result

Source: Survey result 2024

The result in the ANOVA table confirmed that F is greater than 1 which is 103.109 and P<0.01 which means, the independent variables taken together have statistically significant relationship with the dependent variable under study. The other main result under the model summary table 4.20 below showed the R or coefficient of correlation of the model is 0.971 or 97.1% and adjusted R Square or

coefficient of determination of the model is 0.942 or 94.2%, this means 94.2% of the variation in project performance is explained by the linear relationship with the independent variables which suggests that, there are other 5.8% contributing factors that contribute for variation in project performance. This is left for other researchers to find out these factors.

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.971[a]	.942	.933	.21412	1.775

- Predictors: (Constant), stakeholder management, quality management, cost management, integration management, schedule management, risk management, scope management, communication management, procurement management, resource management.
- Dependent Variable: project performance

Table 4.19 Model Summary

Source: Survey result 2024

The regression analysis was done using Project performance as the dependent variable and stakeholder management, quality management, cost management, integration management, schedule management, risk management, scope management, communication management, procurement management, resource management as independent variables. The following table depicted the analysis's result as follow:

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.377	.199		-1.895	.063
Integration management	.176	.077	.107	2.282	.026
scope management	.055	.079	.038	.700	.487
schedule management	.013	.080	.010	.158	.875
cost management	.535	.032	.651	16.951	.000
quality management	.389	.033	.445	11.875	.000
resource management	-.064	.111	-.048	-.574	.568
communication management	.146	.094	.115	1.541	.128
risk management	-.057	.080	-.045	-.717	.476
procurement management	-.101	.087	-.084	-1.157	.252
stakeholder management	-.032	.072	-.028	-.453	.652

Table 4.20 *Regression coefficients result (Beta analysis)*

Source: Survey result 2024

Table 4.20 above shows that Integration management, cost management, quality management has a statistically significant relationship with the dependent variable since their p-value is below the alpha level, which is 0.05. However, the other seven independent variables were found to be statistically insignificant.

Based on the standardized beta coefficients, the strongest predictor of the dependent variable is cost management with a beta value of 0.651.Therefore, from the above table; we can drive the model as follows:

Yi = -0.77 + 0.176X1 + 0.055X2+ 0.013 X3 + 0.535X4+ 0.389X5 - 0.064X6+ 0.146X7 -0.057X8 - 0.101X9 -0.032X10

4.6 Test of Hypothesis and Discussion of Results

Hypothesis 1 - Rejected

H0=Project Integration Management does not significantly affect project performance. Based on the standardized beta coefficients, Project Integration Management has a beta value of 0.176, which indicates that there is positive relation with dependent variable. since p is less than our preset level of significance 0.05 i.e. P=0.026 is less than 0.05, Indicates the correlation between Project Integration Management and project performance is statistically significant therefore we reject null hypothesis H0 and accept the alternate H1 "Project Integration Management significantly affect project performance."

Hypothesis 2 - Accepted

H0=Project scope Management does not significantly affect project performance. Based on the standardized beta coefficients, Project scope Management has a beta value of 0.055, which indicates that there is +ve relation with dependent variable. Since p is greater than our preset level of significance 0.05 i.e. P=0.487 is greater than 0.05, Indicates the correlation between Project scope Management and project performance is statistically insignificant therefore we accept null hypothesis H0 "Project scope Management does not significantly affect project performance."

Hypothesis 3 - Accepted

H0=Project schedule Management does not significantly affect project performance. Based on the standardized beta coefficients, Project schedule Management has a beta value of 0.013, which indicates that there is positive relation with dependent variable. Since p is greater than our preset level of significance 0.05 i.e. P=0.875 is greater than 0.05, Indicates the correlation between Project schedule Management and project performance is statistically insignificant therefore we accept null hypothesis H0 "Project schedule Management does not significantly affect project performance."

Hypothesis 4 - Rejected

H0=Project cost Management does not significantly affect project performance. Based on the standardized beta coefficients, Project cost Management has a beta

value of 0.535, which indicates that there is positive relation with dependent variable. since p is less than our preset level of significance 0.05 i.e. P=0.000 is less than 0.05, Indicates the correlation between Project cost Management and project performance is statistically significant therefore we reject null hypothesis H0 and accept the alternate H1 “Project cost Management significantly affect project performance.”

Hypothesis 5 - Rejected

H0=Project Quality Management does not significantly affect project performance. Based on the standardized beta coefficients, Project quality Management has a beta value of 0.389, which indicates that there is positive relation with dependent variable. since p is less than our preset level of significance 0.05 i.e. P=0.000 is less than 0.05, Indicates the correlation between Project quality Management and project performance is statistically significant therefore we reject null hypothesis H0 and accept the alternate H1 “Project quality Management significantly affect project performance.”

Hypothesis 6 - Accepted

H0=Project Resource Management does not significantly affect project performance. Based on the standardized beta coefficients, Project resource Management has a beta value of -0.064, which indicates that there is negative relation with dependent variable. Since p is greater than our preset level of significance 0.05 i.e. P=0.568 is greater than 0.05, Indicates the correlation between Project Resource Management and project performance is statistically insignificant therefore we accept null hypothesis H0 “Project Resource Management does not significantly affect project performance.”

Hypothesis 7 - Accepted

H0=Project Communication Management does not significantly affect project performance. Based on the standardized beta coefficients, Project communication Management has a beta value of 0.146, which indicates that there is positive relation with dependent variable. Since p is greater than our preset level of significance 0.05 i.e. P=0.128 is greater than 0.05, Indicates the correlation

between Project communication Management and project performance is statistically insignificant therefore we accept null hypothesis H0 “Project communication Management does not significantly affect project performance.”

Hypothesis 8 - Accepted

H0=Project risk Management does not significantly affect project performance. Based on the standardized beta coefficients, Project risk Management has a beta value of -0.057, which indicates that there is negative relation with dependent variable. Since p is greater than our preset level of significance 0.05 i.e. P=0.476 is greater than 0.05, Indicates the correlation between Project risk Management and project performance is statistically insignificant therefore we accept null hypothesis H0 “Project risk Management does not significantly affect project performance.”

Hypothesis 9 - Accepted

H0=Project Procurement Management does not significantly affect project performance. Based on the standardized beta coefficients, Project procurement Management has a beta value of -0.101, which indicates that there is negative relation with dependent variable. Since p is greater than our preset level of significance 0.05 i.e. P=0.252 is greater than 0.05, Indicates the correlation between Project risk Management and project performance is statistically insignificant therefore we accept null hypothesis H0 “Project procurement Management does not significantly affect project performance.”

Hypothesis 10 - Accepted

H0=Project stake holder Management does not significantly affect project performance. Based on the standardized beta coefficients, Project stake holder Management has a beta value of -0.032, which indicates that there is negative relation with dependent variable. Since p is greater than our preset level of significance 0.05 i.e. P=0.652 is greater than 0.05, Indicates the correlation between Project stake holder Management and project performance is statistically insignificant therefore we accept null hypothesis H0 “Project stake holder Management does not significantly affect project performance.”

CHAPTER FIVE

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.7 Introduction

This chapter consists of the summary of findings, conclusion, recommendations and suggestion for area of further research sections

4.8 Summary of findings

4.8.1 Demographic information of respondents

As shown on summarized table below; the demographic distribution of all respondents was from all types of groups to gain an appropriate response from all perspectives. The distribution was based on their age group, level of education, work place, and job category and work experience. It is clearly elaborated as follows

Gender	**male**	**female**		
	72	28		
Age group	**18-29**	**30-39**	**40-49**	**above 50**
Percentage (%)	1.3	65.3	26.7	6.7
Level Of Education	**PHD**	**masters degree**	**Bachelor degree**	**Diploma/ Certificate**
Percentage (%)	0	53.3	46.7	0
Work Place/department	**Building design sub process**	**Project program management sub process**	**Supervision and contract admin sub process**	**Urban design sub process**
Percentage (%)	49.3	16.0	25.3	9.3
Job category	**Project coordinator**	**Project manager**	**project member**	**Support Staffs**
Percentage (%)	26.6	29.4	44.0	0
Work experience on ECDSWCo projects	**0-5yrs**	**6-10yrs**	**11-15yrs**	**above 16yrs**
Percentage (%)	21.3	26.7	30.7	21.3

Table 5.1 Summary of demographic information

Source: Survey result 2024

4.8.2 Finding on analysis

As per the regression result, Integration management, cost management, quality management has a statistically significant relationship with the dependent variable since their p-value is below the alpha level, which is 0.05. However, the other seven independent variables were found to be statistically insignificant. Based on the standardized beta coefficients, the strongest predictor of the dependent variable is cost management with a beta value of 0.65.

From 10 hypothesis three of them are rejected which are integration, cost and quality management do not significantly affect project performance. The rest seven are accepted.

4.9 Conclusion

Based on the study on the effect of project management practices on public enterprises' performance, it can be concluded that project management practices play a crucial role in influencing the performance outcomes of public enterprises. The research findings indicate that effective project management practices, such as integration management, scope management, schedule management, cost management, quality management, resource management, communication management, risk management, procurement management, and stakeholder management, have a positive impact on the performance of public enterprises. The empirical analysis demonstrates a high level of internal consistency reliability among the measurement items for each project management practice construct. This suggests that the measurement instrument effectively captures the different aspects of project management practices in public enterprises. By implementing robust project management practices, public enterprises can improve project success rates, cost efficiency, timeliness, and quality of deliverables, stakeholder satisfaction, and overall organizational effectiveness. This, in turn, contributes to enhancing the performance and achieving the objectives of public enterprises more effectively. Therefore, it is recommended that public enterprises prioritize the adoption and implementation of effective project management practices to drive

better performance outcomes. This may involve investing in training and development programs for project managers, establishing standardized project management processes, enhancing communication and collaboration among project teams, and regularly monitoring and evaluating project performance to ensure continuous improvement. As the study clearly shows that the project management practices are the major factors to affect the project performance of the sector in terms of project accomplishment with in time, within budget and within set of standards. From the regression analysis project **Integration management, project cost management, project quality management** practices have a major impact on a project performance in the case of ECDSWCo-BUDSWS

4.10 Recommendations

Based on the study we found, the sector should exercise project Integration management, project cost management and project quality management practices to the best level. Because it has a significant impact on the performance of the project in terms of accomplishment of projects with in time, within budget and set of standards.

I recommend that the sector was better implement the best practices of PMBOK guide of PMI. Beside the implementation of the guide lines, the sector has to train its project managers and help them to get certified (PMP or prince 2 certifications) in order to be competitive with in the construction industry.

In addition to the above

- The sector should improve the project Integration management, project cost management and project quality management practices to the best practice of PMBOK guide of PMI
- The sector should work on capacity building of project teams not only project managers

4.11 Area of Further Research

This study only covered the effect of project management practices on public enterprises performance: the case of ECDSWCo (building and urban design and supervision works sector). Further studies should be studied on the sector regarding the project management. This study tried to evaluate the effect project management practices project performance of the sector based on the 10 project knowledge areas which consists of 49 process groups.

As the R- square in the model summary shows that there are other 5.8% contributing factors that contribute for variation in project performance. So I recommend other researchers to find out these factors.

Beside the above area of further research, I recommend that the next researcher was also better to study the project maturity level projects on the sector.

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Appendix A: Research Questionnaires

Addis Ababa University

School of commerce

Department of project management (Graduate program)

Questionnaire

Dear Respondent

My name is wubbante deneke tsegaye who is one of the graduate students in project management distance program at Addis Ababa university school of commerce. Currently I am doing my academic research on the effects of project management practices on public enterprises: the case of Ethiopian construction design and Supervision Corporation. So this questionnaire is prepared to collect data for my thesis paper for the title mentioned above. The information acquired here in this questionnaire was solely be used for academic purpose only and its confidentiality is at the heart of the study. You are kindly requested to provide your genuine, honest and timely response to the questions

Please note that you are not required to mention your name in the questionnaire and expected to indicate your level of agreement or disagreement by using (√) mark on the appropriate box given corresponding to each statement and state your opinion on the space provided for open question.

If you are in a need of any further clarification or information regarding the questionnaires please reach me through my Mobile Number: 0912117396 and E-mail: wubedene@gmail.com

Thank you in advance for devoting your time and energy to complete the questionnaires

Name: Wubbante deneke

Email: wubedene@gmail.com

Cell phone no: +251912117396

Part I: Background Information

Please tick ✔ on your response in the box provides

1. Sex

A) Male ☐ B) Female ☐

2. Age group

A) 18-29 ☐ B) 30-39 ☐ C) 40-49 ☐ C) Above 50 ☐

3. Level Of education

A) PHD ☐ B) Masters degree ☐ C) Undergraduate degree ☐

D) Diploma/Certification ☐ E) if others please specify _____

4. Work place

   A) Building design sub process ☐

   B) Supervision and contract administration sub process ☐

   C) Project program management sub process ☐

   D) Urban design sub process ☐ E) Others ☐

5. Job Category

A) Project coordinator ☐ B) Project manager ☐ C) project member ☐

D) Support staff ☐ E) if others please specify _____

6. Work experience on ECDSWCo projects?

A) 0-5yrs ☐ B) 6-10yrs ☐ C) 11-15yrs ☐ D) above16yrs ☐

Part II: project management practices

Please indicate your view to what extent you agree or disagree in practicing the following project knowledge area and processes. Please tick ✔ on your selected responses.

(5=strongly agree, 4=Agree, 3=neutral, 2=disagree, 1= strongly disagree)

Factor Element		5 strongly agree	4 Agree	3 neutral	2 disagree	1 strongly disagree
I. Project integration management						
1	Project charter was developed	5	4	3	2	1
2	Project management plan was developed	5	4	3	2	1
3	Project activities were managed and directed as defined in the project management plans	5	4	3	2	1
4	Project knowledge areas was managed	5	4	3	2	1
5	Work monitoring was practiced	5	4	3	2	1
6	Change control was carried out to manage all change requests	5	4	3	2	1
7	Project closure is carried out to formally complete a project or phase	5	4	3	2	1
8	Experienced project manager assigned to manage the integration management	5	4	3	2	1
9	Not preparing the project charter can affect the project performance with	5	4	3	2	1

	time, quality and scope					
10	If project management plan is not prepared, do you think, can it affect the performance of the organization to accomplish projects within the scope, time and budget	5	4	3	2	1
11	If project management plan is not prepared, can the organization meet the projects with in quality, time and scope/	5	4	3	2	1
12	Managing project knowledge areas helps for the completion of projects with in time, budget and scope	5	4	3	2	1
13	Assigning of experienced project manager have a positive effect on project integration management and the performance of the corporation/sector/ on projects	5	4	3	2	1
14	Change in scope affect the timely completion of the project	5	4	3	2	1

15	Lack of good integration management can negatively affect the performance of the organization or corporation on projects to accomplish with time, budget and scope	5	4	3	2	1
II. Project Scope management						
1	Scope management plan was developed	5	4	3	2	1
2	Project requirements were developed	5	4	3	2	1
3	Project scope was defined	5	4	3	2	1
4	Work breakdown structure was developed	5	4	3	2	1
5	Completed project deliverables were validated	5	4	3	2	1
6	Scope changes were controlled and evaluated to the scope baselines	5	4	3	2	1
7	Experienced project manager assigned to manage the project scope management	5	4	3	2	1
8	Not preparing the scope management plan can affect the performance of	5	4	3	2	1

	the corporation/sector/ to accomplish the projects with in time, quality and scope.					
9	If project requirements is not developed, do you think, can it affect the performance of the organization to accomplish the project with in time, quality and scope	5	4	3	2	1
10	If Project scope is not defined, can the organization meet the quality, time and scope aspect of the project?	5	4	3	2	1
11	If WBS is not developed, can the corporation/Sector/ meet the quality, time and scope aspect of the project?	5	4	3	2	1
12	Validating Completed project deliverables can affect the performance of projects	5	4	3	2	1
13	Assigning of experienced project manager have a	5	4	3	2	1

	positive effect on the project scope management and performance of the corporation on projects					
14	Change in scope affect the timely completion of the project	5	4	3	2	1
15	Lack of good project scope management can negatively affect the performance of the corporation/sector/ on projects to accomplish with time, budget and scope	5	4	3	2	1
III. Project Schedule management						
1	Schedule management plan was developed	5	4	3	2	1
2	List of activities were defined	5	4	3	2	1
3	Sequence of project activities were identified	5	4	3	2	1
4	Duration needed to complete activities with resource were estimated	5	4	3	2	1
5	Baseline project schedule was developed	5	4	3	2	1
6	Changes to the baseline	5	4	3	2	1

	project schedule were monitored and evaluated					
7	Not preparing the schedule management plan can affect the performance of the corporation/sector/ to accomplish the projects with in time.	5	4	3	2	1
8	If list of activities is not defined, do you think, can it affect the performance of the organization to accomplish the project with in time?	5	4	3	2	1
9	Assigning of experienced project manager have a positive effect on the project schedule management and performance of the corporation/sector/ on projects	5	4	3	2	1
10	If Changes to the baseline project schedule were not monitored and evaluated, can it affect the timely completion of the project	5	4	3	2	1
11	Lack of good project	5	4	3	2	1

	schedule management can negatively affect the performance of the corporation/sector/ on projects to accomplish with time.					
IV. Project Cost management						
1	Project cost management policies and guidelines were developed	5	4	3	2	1
2	Cost needed to complete the project work was estimated	5	4	3	2	1
3	Project budget was determined to establish authorized cost base line	5	4	3	2	1
4	Project cost changes were monitored and managed	5	4	3	2	1
5	Not preparing the Cost management plan can affect the performance of the corporation/sector/ to accomplish the projects within budget.	5	4	3	2	1
6	If Cost needed to complete the project work is not estimated, do you think, can it affect the performance of the	5	4	3	2	1

	organization to accomplish the project within Budget?					
7	Assigning of experienced project manager have a positive effect on the project cost management and performance of the corporation/sector/ on projects	5	4	3	2	1
8	If Project cost changes were not monitored and evaluated, can it affect the completion of the project within budget?	5	4	3	2	1
9	Lack of good project Cost management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the budget.	5	4	3	2	1
V. Project Quality management						
1	Quality management plan was developed	5	4	3	2	1
2	The quality standards were translated into executable quality activities	5	4	3	2	1

3	Quality standards were controlled to asses performance and ensure project deliverables	5	4	3	2	1
4	Not preparing the Quality management plan can affect the performance of the corporation/sector/ to accomplish the projects within the standard quality.	5	4	3	2	1
5	If The quality standards are not translated into executable quality activities, do you think, can it affect the performance of the organization to accomplish the project within the quality?	5	4	3	2	1
6	Assigning of experienced project manager have a positive effect on the project quality management and performance of the corporation/sector/ on projects	5	4	3	2	1
7	Lack of good project	5	4	3	2	1

	quality management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the required quality.					
VI. Project Resource management						
1	Resource management plan was developed	5	4	3	2	1
2	Material and human resources were estimated necessary to perform project work	5	4	3	2	1
3	Resource required to complete project work were obtained	5	4	3	2	1
4	Team were developed to enhance performance					
5	Tracking team performance and managing team changes were carried out.	5	4	3	2	1
6	Resources were monitored and controlled to ensure they are available	5	4	3	2	1
7	Not preparing the resource management	5	4	3	2	1

	plan can affect the performance of the corporation/sector/ to accomplish the projects within the budget.					
8	If The resources are not monitored and controlled to ensure they are available, do you think, can it affect the performance of the organization to accomplish the project within the budget?	5	4	3	2	1
9	If the team changes are not carried out on time, do you think, can it affect the performance of the organization to accomplish the project within the time and budget?	5	4	3	2	1
10	Assigning of experienced project manager have a positive effect on the project resource management and performance of the corporation/sector/ on	5	4	3	2	1

	projects					
11	Lack of good project resource management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the required budget.	5	4	3	2	1
VII. Project Communication management						
1	Project communication guide lines were developed	5	4	3	2	1
2	Timely and appropriate collection, distribution and disposition of information were managed.	5	4	3	2	1
3	Information needs of the project and its stakeholders met.	5	4	3	2	1
4	Not preparing the Communication management guide lines can affect the performance of the corporation/sector/ to accomplish the projects within the given time.	5	4	3	2	1

5	If Timely and appropriate collection, distribution and disposition of information is not managed, do you think, can it affect the performance of the organization to accomplish the project within the given time?	5	4	3	2	1
6	Assigning of experienced project manager have a positive effect on the project communication management and performance of the corporation/sector/ on projects	5	4	3	2	1
7	Lack of good project communication management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the given time.	5	4	3	2	1
VIII. Project Risk management						
1	Risk management plan was developed	5	4	3	2	1

2	Project risk was identified	5	4	3	2	1
3	Risk analysis were performed to identify the effect on the project	5	4	3	2	1
4	Risk response strategy to address project risk were developed	5	4	3	2	1
5	Agreed upon risk responses were implemented	5	4	3	2	1
6	The implementation of risk responses were monitored	5	4	3	2	1
7	Not preparing the Risk management Plan can affect the performance of the corporation/sector/ to accomplish the projects within the given time.	5	4	3	2	1
8	If Project risk is not identified, do you think, can it affect the performance of the organization to accomplish the project within the given time?	5	4	3	2	1
9	If Project risk analysis is not Performed and identified its effect on	5	4	3	2	1

	projects, do you think, can it affect the performance of the organization to accomplish the project within the given time?					
10	If Project Risk response strategy to address project risk is not developed, do you think, can it affect the performance of the organization to accomplish the project within the given time?	5	4	3	2	1
11	Assigning of experienced project manager have a positive effect on the project risk management and performance of the corporation/sector/ on projects	5	4	3	2	1
12	Lack of good project risk management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the given time.	5	4	3	2	1
IX. Project Procurement management						
1	Project procurement plan	5	4	3	2	1

	were developed					
2	Procurement activities conducted as per the plan	5	4	3	2	1
3	Procurement relationships were managed	5	4	3	2	1
4	Not preparing the Procurement management Plan can affect the performance of the corporation/sector/ to accomplish the projects within the given time.	5	4	3	2	1
5	If Procurement activities are not conducted as per the plan, do you think, can it affect the performance of the organization to accomplish the project within the given time?	5	4	3	2	1
6	If Procurement relationships are not managed, do you think, can it affect the performance of the organization to accomplish the project within the given time?	5	4	3	2	1
7	Assigning of experienced	5	4	3	2	1

	project manager have a positive effect on the project Procurement management and performance of the corporation/sector/ on projects					
8	Lack of good project Procurement management can negatively affect the performance of the corporation/sector/ on projects to accomplish with in the given time.	5	4	3	2	1
X. Project Stakeholder management						
1	Project stake holders were identified	5	4	3	2	1
2	Stakeholder engagement plan were developed	5	4	3	2	1
3	Active communication with stakeholders were done to ensure their engagement	5	4	3	2	1
4	Stakeholders relationships were monitored and managed	5	4	3	2	1
5	Not preparing the stake holder engagement Plan can affect the	5	4	3	2	1

	performance of the corporation/sector/ to accomplish the projects within the scope.					
6	If Active communications with stakeholders are not done to ensure their engagement, do you think, can it affect the performance of the organization to accomplish the project within the required scope?	5	4	3	2	1
7	Assigning of experienced project manager have a positive effect on the project stake holder management and performance of the corporation/sector/ on projects	5	4	3	2	1
8	Lack of good project stake holder management can negatively affect the performance of the corporation/sector/ on projects to accomplish within the scope.	5	4	3	2	1

Part III: project Performance

Based on the experience of managing the projects in ECDSWCo, please indicate how often the following goals are achieved. Please tick ✔ on your selected responses.

(5=Always, 4=frequently, 3=sometimes, 2=seldom, 1= Never)

Project goals		5 Always	4 frequently	3 sometimes	2 seldom	1 Never
1	Project Completed within planned schedule	5	4	3	2	1
2	Project Completed within the budget	5	4	3	2	1
3	Project Completed within the set of standard(quality)	5	4	3	2	1

Part IV: personal opinion

How do you describe your company's project management practices in terms of the above ten project management knowledge areas? Please write down on the below space provided.

_____

_____

_____

_____

_____

_____

_____

_____

Thank you for your kind cooperation and valuable response for the study!

Appendix B: Major SPSS out puts

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.971[a]	.942	.933	.21412	1.775

a. Predictors: (Constant), stakeholder, quality, cost, integration, schedule, risk, scope, communication, procurement, resource

b. Dependent Variable: performance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.274	10	4.727	103.109	.000[b]
	Residual	2.888	63	.046		
	Total	50.162	73			

a. Dependent Variable: performance

b. Predictors: (Constant), stakeholder, quality, cost, integration, schedule, risk, scope, communication, procurement, resource

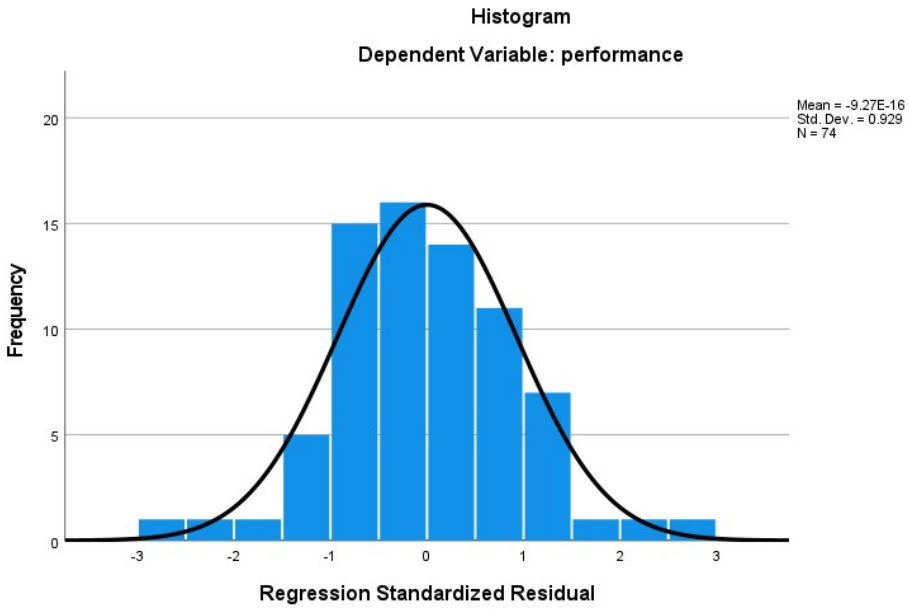
Coefficients[a]

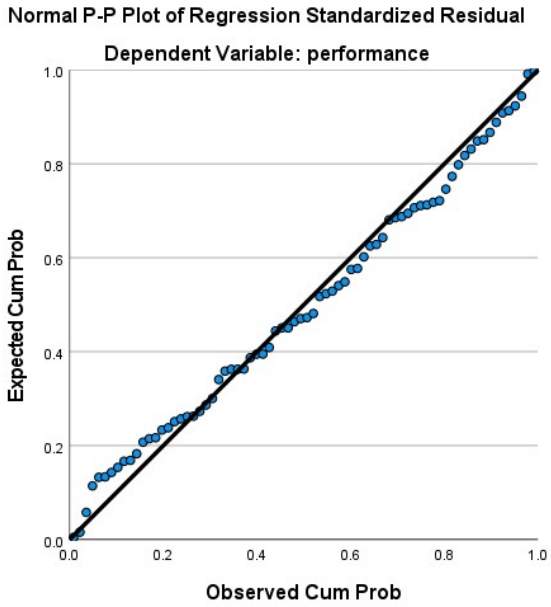
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.377	.199		-1.895	.063
	integration	.176	.077	.107	2.282	.026
	scope	.055	.079	.038	.700	.487
	schedule	.013	.080	.010	.158	.875
	cost	.535	.032	.651	16.951	.000
	quality	.389	.033	.445	11.875	.000
	resource	-.064	.111	-.048	-.574	.568
	communication	.146	.094	.115	1.541	.128
	risk	-.057	.080	-.045	-.717	.476
	procurement	-.101	.087	-.084	-1.157	.252
	stakeholder	-.032	.072	-.028	-.453	.652

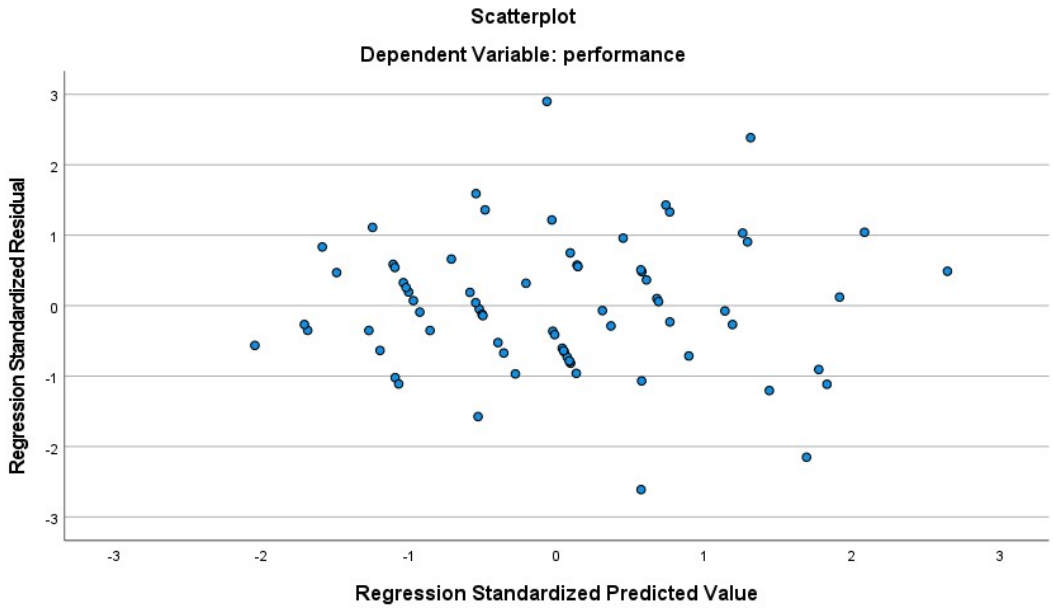
Model		95.0% Confidence Interval for B		Collinearity Statistics	
		Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.774	.021		
	integration	.022	.330	.413	2.423
	scope	-.103	.214	.310	3.225
	schedule	-.147	.172	.225	4.439
	cost	.471	.598	.619	1.616
	quality	.323	.454	.652	1.535
	resource	-.286	.159	.129	7.770
	communication	-.043	.334	.165	6.059
	risk	-.216	.102	.228	4.385
	procurement	-.275	.073	.172	5.814
	stakeholder	-.176	.111	.232	4.312

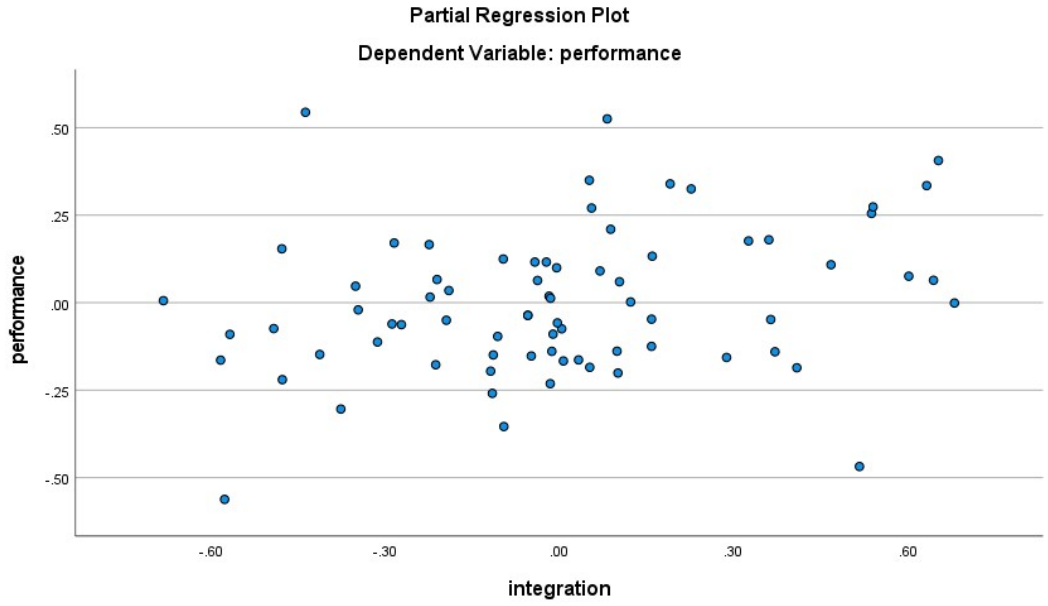
a. Dependent Variable: performance

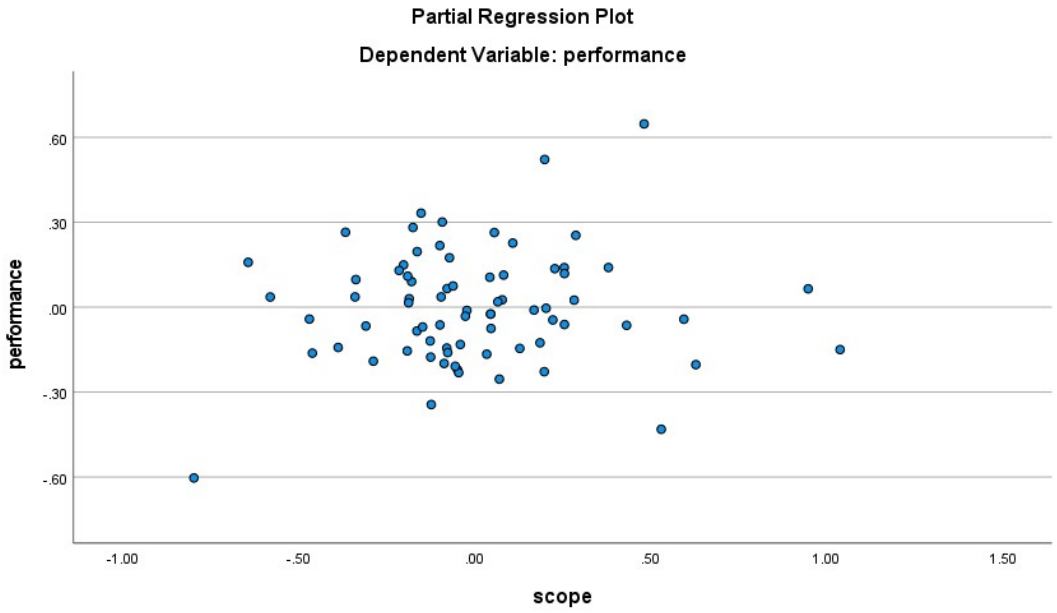
Charts

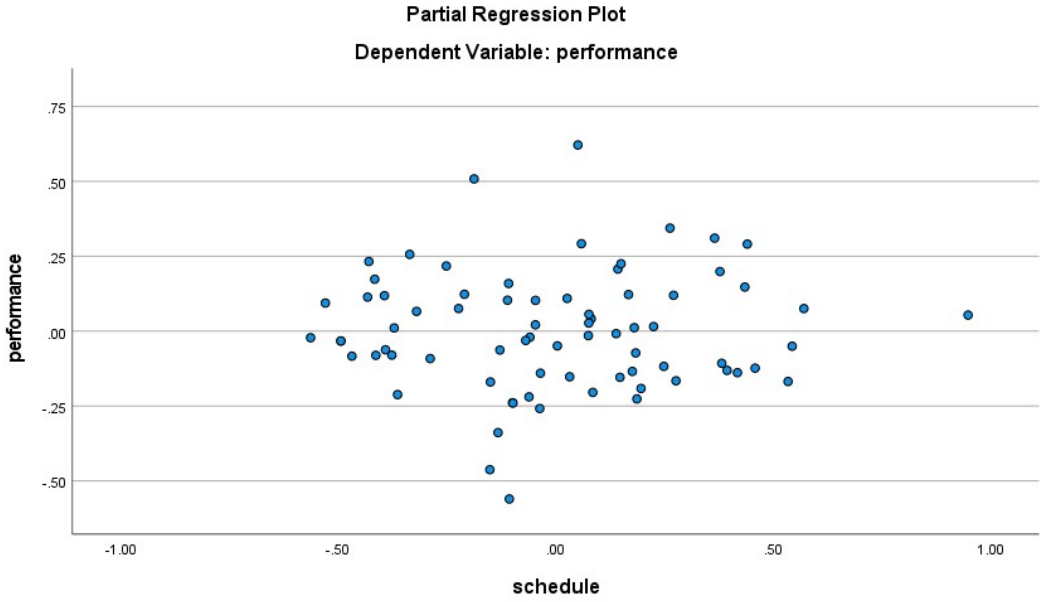

Histogram
Dependent Variable: performance
Mean = -9.27E-16
Std. Dev. = 0.929
N = 74
Frequency
Regression Standardized Residual

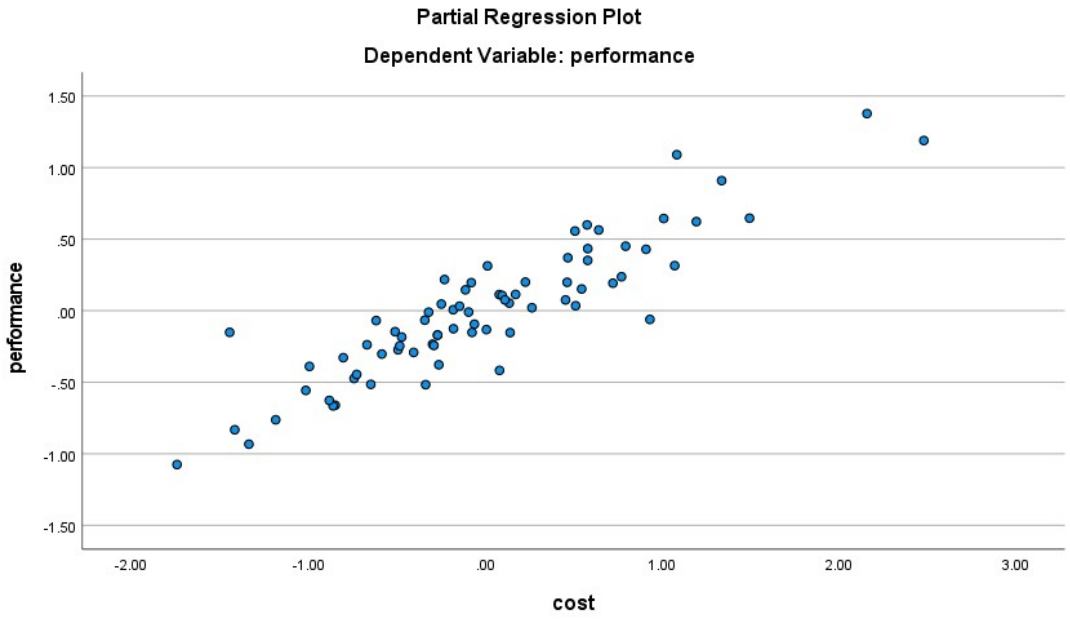

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: performance
Expected Cum Prob
Observed Cum Prob


Scatterplot
Dependent Variable: performance
Regression Standardized Residual
Regression Standardized Predicted Value
3
2
1
0
-1
-2
-3


Partial Regression Plot
Dependent Variable: performance
performance
integration
.50
.25
.00
-.25
-.50
-.60
-.30
.00
.30
.60


Partial Regression Plot
Dependent Variable: performance
performance
.60
.30
.00
-.30
-.60
-1.00
-.50
.00
.50
1.00
1.50
scope


Partial Regression Plot
Dependent Variable: performance
performance
.75
.50
.25
.00
-.25
-.50
-1.00
-.50
.00
.50
1.00
schedule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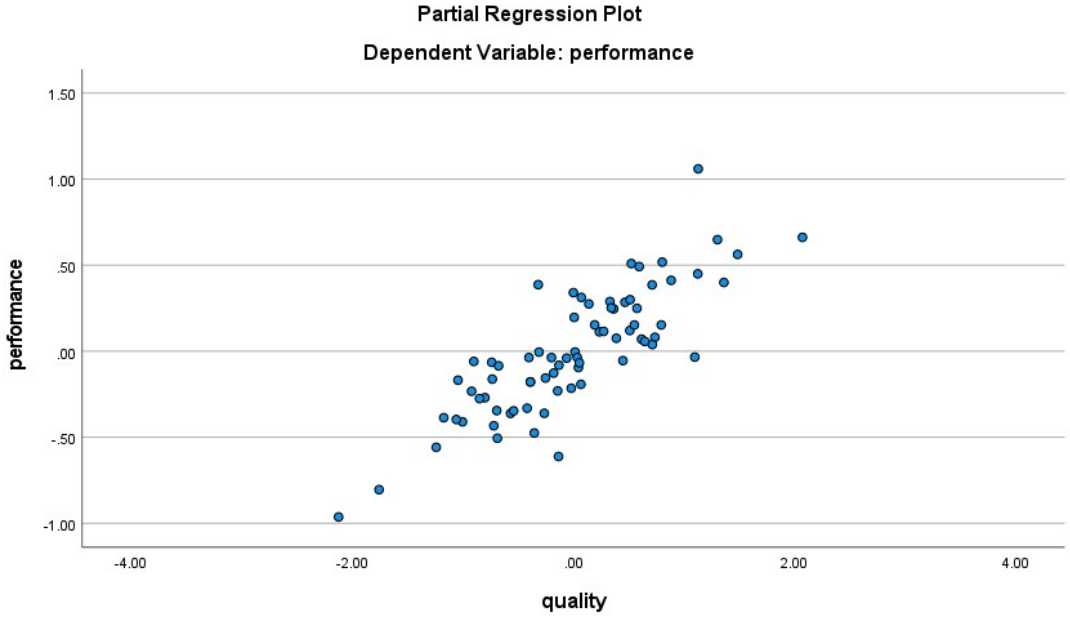
Dependent Variable: performance
performance
1.50
1.00
.50
.00
-.50
-1.00
-1.50
-2.00
-1.00
.00
1.00
2.00
3.00
cost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Dependent Variable: performance
performance
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1.00
.50
.00
-.50
-1.00
-4.00
-2.00
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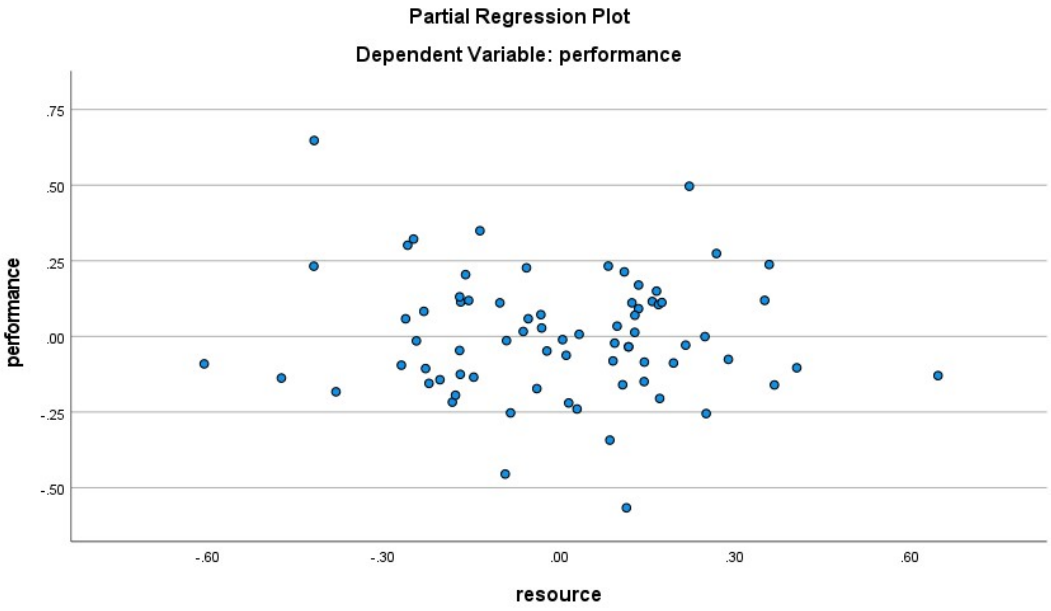
2.00
4.00
quality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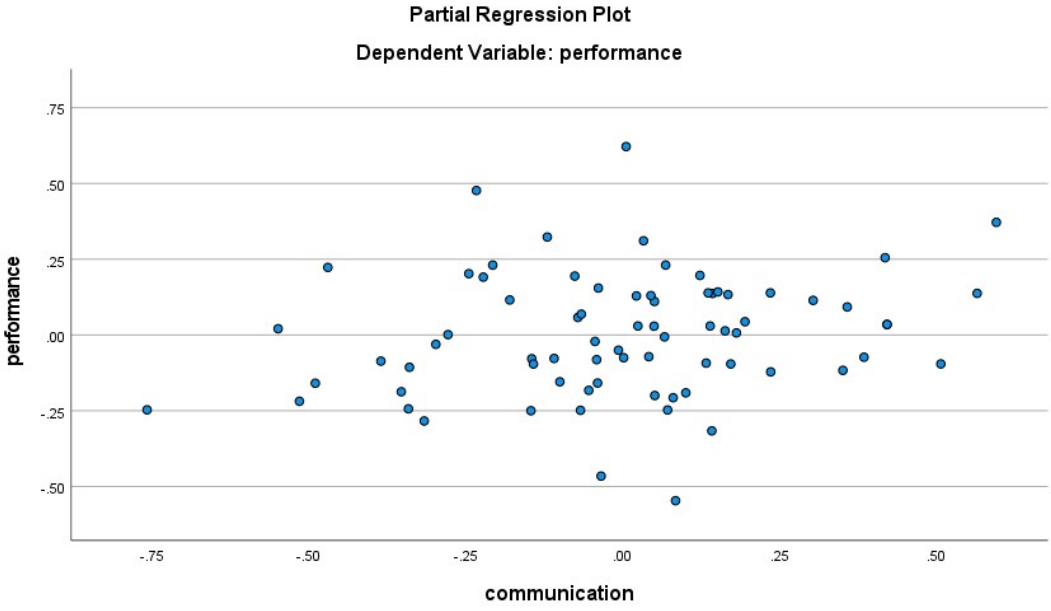
Dependent Variable: performance
performance
.75
.50
.25
.00
-.25
-.50
-.60
-.30
.00
.30
.60
resource


Partial Regression Plot
Dependent Variable: performance
performance
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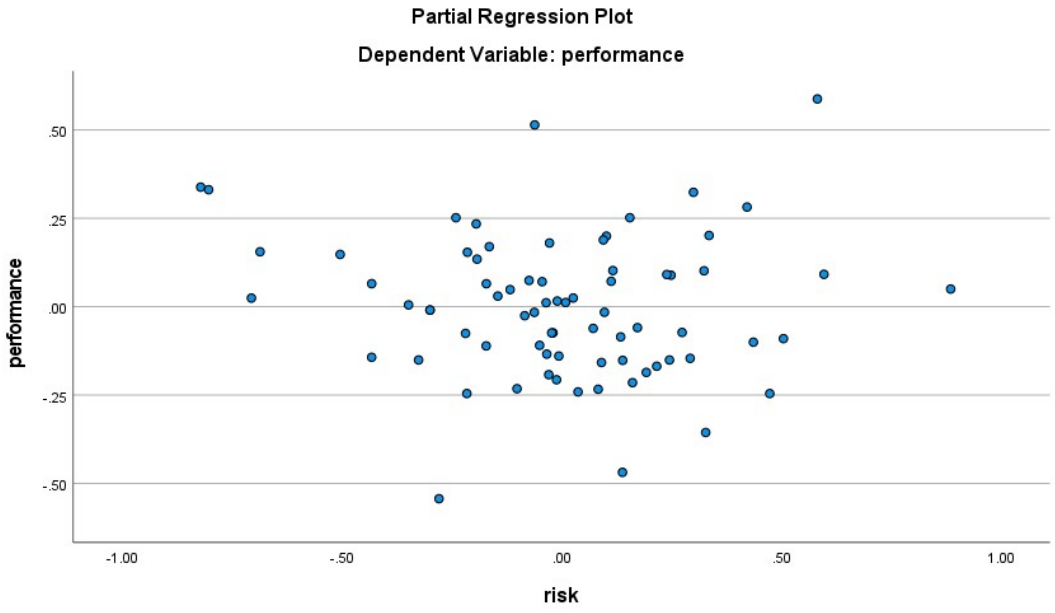
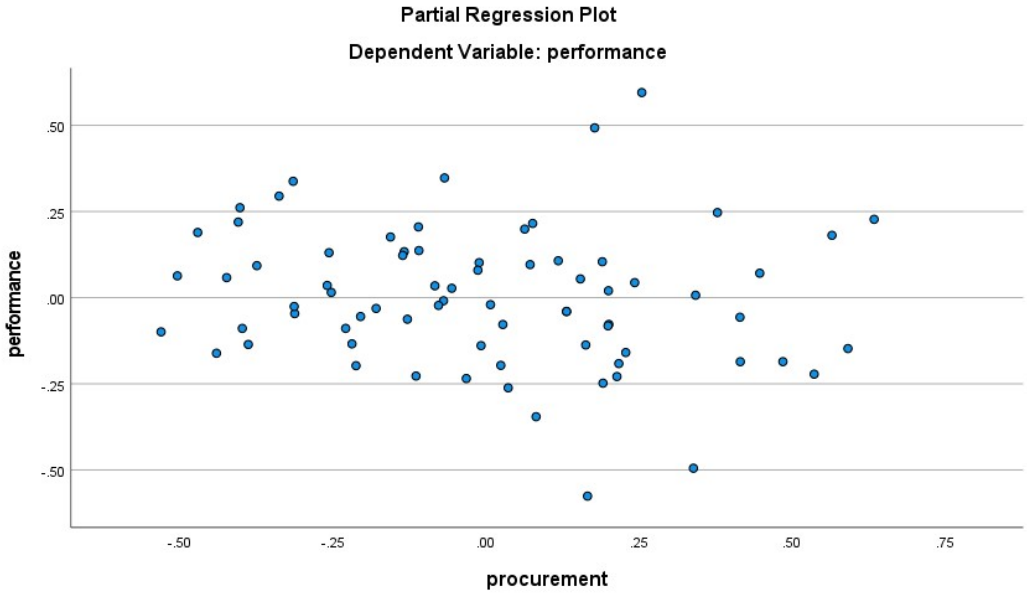
.50
.25
.00
-.25
-.50
-.75
-.50
-.25
.00
.25
.50
communication


Partial Regression Plot
Dependent Variable: performance
performance
.50
.25
.00
-.25
-.50
-1.00
-.50
.00
.50
1.00
risk


Partial Regression Plot
Dependent Variable: performance
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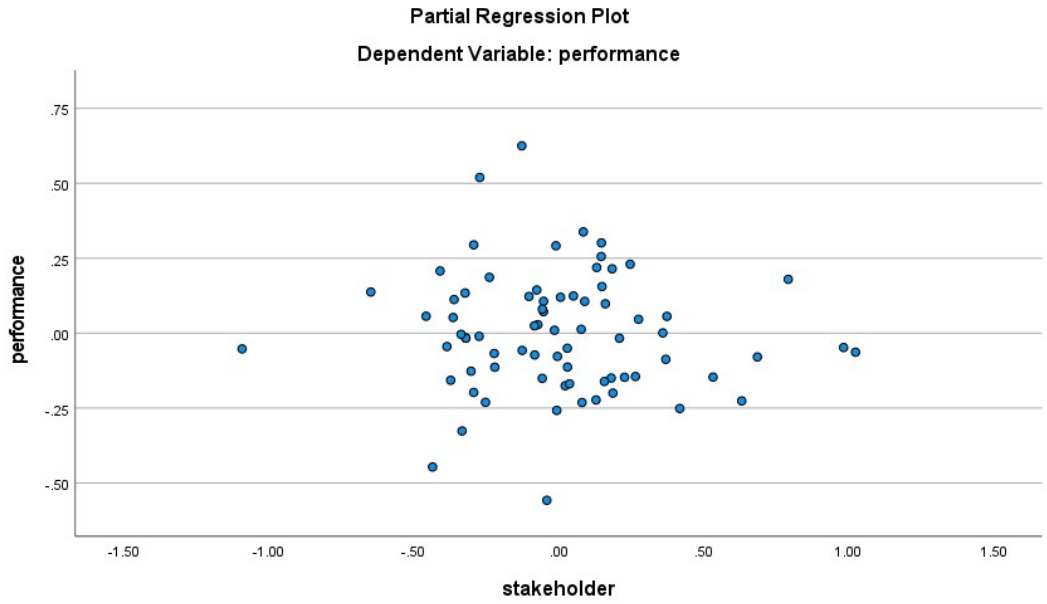
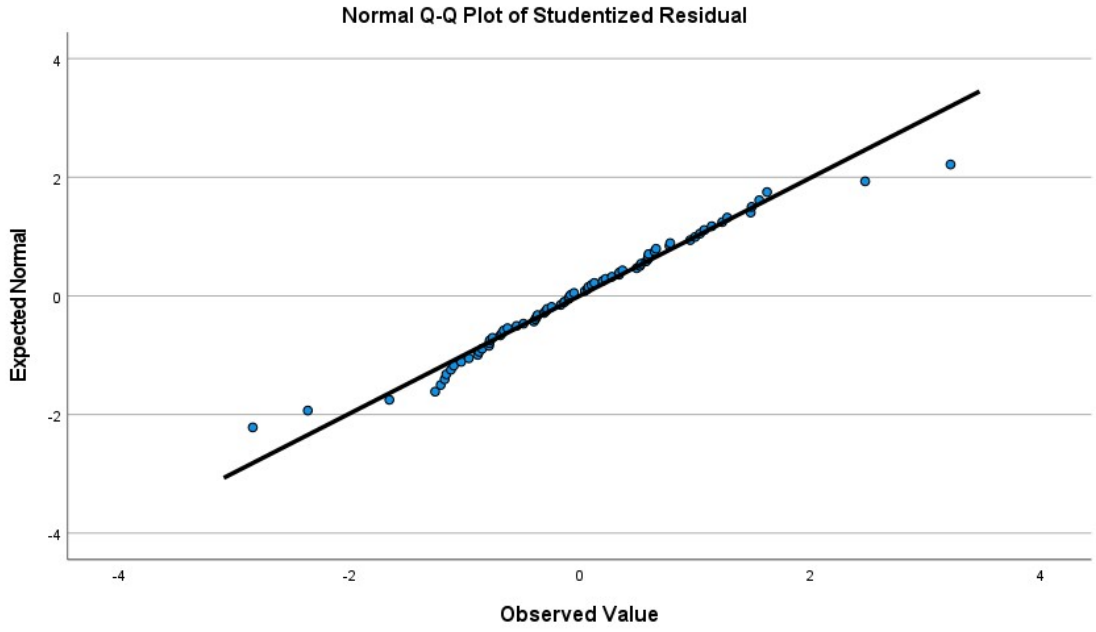
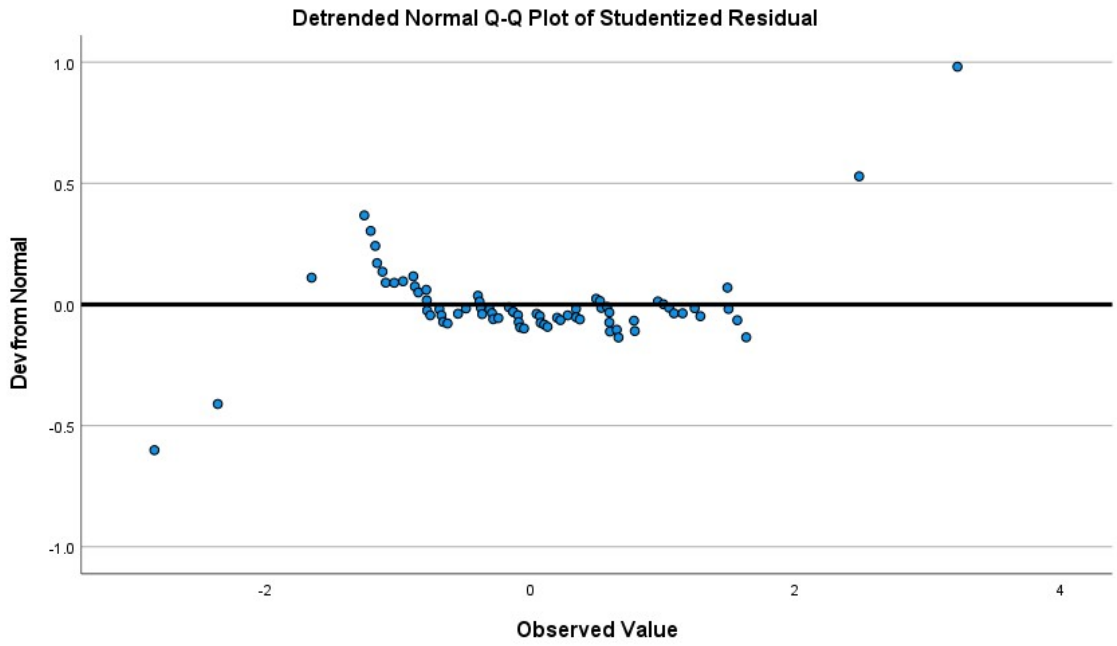
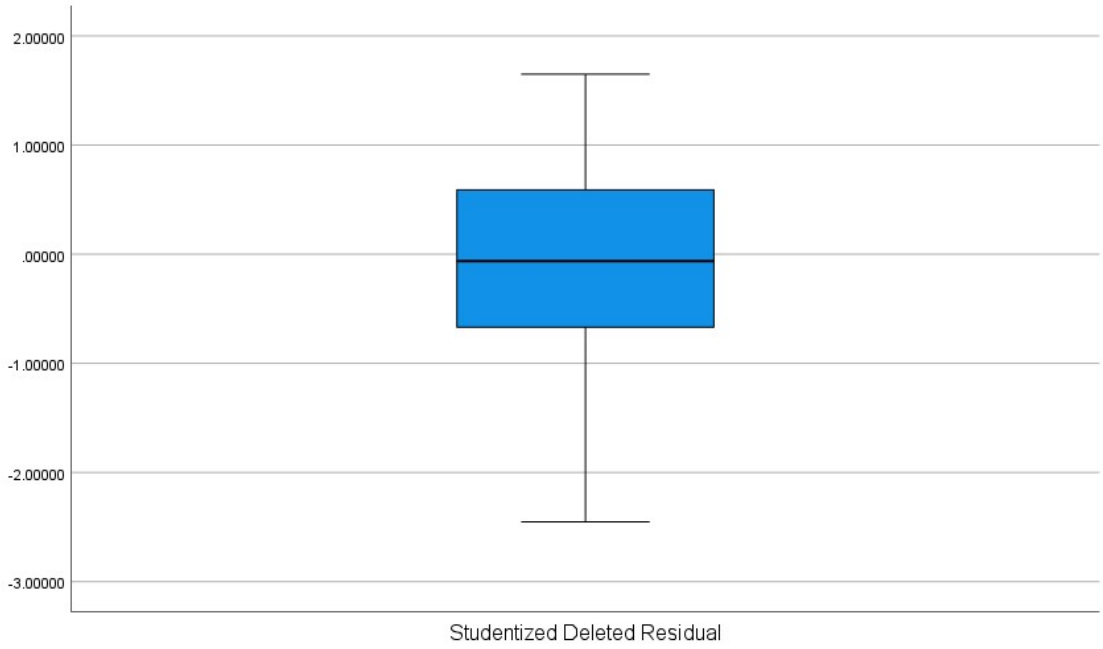
.25
.00
-.25
-.50
-.50
-.25
.00
.25
.50
.75
procurement



Studentized Residual





Studentized Deleted Residual