UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN FOR THE DEVELOPMENT OF A PROJECT MANAGEMENT INFORMATION SYSTEM TO MONITOR AND TRACK THE PROGRESS OF PROJECTS IMPLEMENTED BY THE DEPARTMENT OF PUBLIC SECTOR INVESTMENT PLANNING IN ST. KITTS AND NEVIS

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FINAL GRADUATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
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This Final Graduation Project was approved by the University as
partial fulfillment of the requirements to opt for the
Master in Project Management (MPM) Degree

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DEDICATION

This work is dedicated to my family, friends, well-wishers and all those who supported, encouraged, and assisted me during this MPM program and even more so during the completion of this Final Graduation Project. Without the combined efforts of all those persons at every step of my journey, it would not have been possible for me to be here today.

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I am a firm believer that "with God all things are possible". I therefore give thanks to Lord God Almighty, who has made this FGP possible. I would also like to express my gratitude to the staff at the Department of Public Sector Investment Planning for accommodating me and providing me with the much-needed data and information to complete this FGP. And lastly, to my tutor, Sophia Maria Crawford, I express my appreciation for the guidance given and the patience exhibited during the completion of this FGP.

ABSTRACT

The objective of this Final Graduation Project is to develop a project management plan in compliance with the standards outlined by the Project Management Institute, to establish a Project Management Information System (PMIS) for effective project monitoring at the Department of Public Sector Investment Planning in St. Kitts and Nevis. Currently, there are no specialized project management tools to support the day-to-day operations of the Department of Public Sector Investment Planning. The development of a specialized project management tool allows for the effective monitoring and tracking of Capital Project´s progress so that the Department of Public Sector Investment Planning can fulfil its mandate of monitoring and reporting on capital projects.

The final product of this Final Graduation Project, the project management plan, incorporates all the key aspects of the standards for project management and is made up of the plans for scope, schedule, cost, quality, resource, communications, risk, procurement, and stakeholder management. The Final Graduation Project uses qualitative and mixed research methods which combine qualitative and quantitative research methods to achieve the deliverables, and applies the GPM P5 Standard for Sustainability in Project Management.

Key words: Project Management Plan, Project Management Information System, Capital Projects, Sustainability.

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ABBREVIATIONS AND ACRONYMS

AC	Actual cost
BAC	Budget at completion
CDB	Caribbean Development Bank
CPI	Cost performance index
CV	Cost Variance
EOI	Expression of interest
DIT	Department of Information Technology
EV	Earned Value
FGP	Final Graduation Project
GCF	Green Climate Fund
GPM	Green project management
ICT	Information Communication Technology
IT	Information Technology
M&E	Monitoring and Evaluation
MOA	Memorandum of Agreement
PCDA	Plan-do-check-act
PMIS	Project Management Information System
PSC	Project Steering Committee
PSIP	Public Sector Investment Planning
PV	Planned Value
RACI	Responsible, accountable, consulted, informed
RAM	Responsibility Assignment Matrix
RBS	Risk Breakdown Structure
SDG	Sustainable Development Goals
SPI	Schedule Performance Index
SV	Schedule Variance

UNDP	United Nations Development Programme
WB	World Bank
WBS	Work Breakdown Structure

EXECUTIVE SUMMARY

Public sector capital projects are major investments that play a critical role in driving economic development, improving society´s infrastructure, and enhancing the overall well-being of the people who rely on them (Cleopatra Enterprise, 2024). In 2024, 150 projects were executed by the Federal Government of St. Kitts and Nevis under the Public Sector Investment Programme. The Department of Public Sector Investment Planning is responsible for appraising capital projects, analyzing capital expenditure, and the overall preparation and monitoring of the Public Sector Investment Programme.

The Department of Public Sector Investment Planning has no specialized project management tools incorporated into its day-to-day operations, and as such, the current system does not allow for efficient and effective monitoring and reporting of capital projects´ performance. Having recognized the need for a modernized system, the Department of PSIP secured funding to develop a tool/platform to monitor capital project performance and improve reporting, however they lacked a management plan to guide the development of the tool/platform and ensure the project is completed within budget and on time. This Final Graduation Project was therefore developed to support the Department of Public Sector Investment Planning in developing a tool or platform to improve the monitoring of and reporting on capital projects within budget and on time.

The general objective of the Final Graduation Project was to develop a project management plan in compliance with the standards outlined by the Project Management Institute, to establish a Project Management Information System (PMIS) for effective project monitoring at the Department of Public Sector Investment Planning in St. Kitts and Nevis. The specific objectives were to: to create a Project Charter that outlines the project´s goals and objectives, scope, and resources; to develop a scope management plan that defines the work required to successfully complete the Project Management Information System; to formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed, monitored and managed, and ensures that the project activities will be delivered on time; to develop a cost management plan that outlines how costs for the Project Management Information System will be estimated, managed and monitored to avoid cost overruns; to create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed; to develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed and monitored throughout the project; to create a communication plan that outlines how information regarding the Project Management Information System will be effectively communicated to all the stakeholders who will use the PMIS; to formulate a risk management plan that identifies all potential project risks and the actions required to manage them; to create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for

the Project Management Information System and to design a stakeholder management plan that identifies project stakeholders and effective strategies for their engagement and buy-in.

The methodological approach used to conduct the necessary research to develop the project management plan included qualitative, quantitative, and mixed methods approaches. The information sources used included primary sources such as interviews, meetings, and personal communication, while secondary sources included documents on project management standards, internet articles, journal articles, books, and reports from reputable institutions.

This Final Graduation project is built upon ten comprehensive plans that contribute to the overall project management plan. Based on the results of the research, it can be concluded that when the objectives of the project are aligned to the needs of all stakeholders involved, and the Project Management Institute's (PMI) guidance and best practices for effective project planning, execution, monitoring, and control for all ten project management knowledge areas are incorporated into a project management plan, the project is better positioned to achieve its overall goal. In the case of the FGP, this strategy will result in the successful development of a PMIS to enhance the work of the Department of PSIP.

It is however important to note that project risks may significantly impact the success of the project. As such, it is recommended that the project manager ensures that significant focus is placed on engaging, involving, and communicating effectively with the key stakeholders of the project to ensure their support to the project and the implementation of project activities. The project manager must also emphasize the critical role of the IT Department, as their expertise will be required to ensure the PMIS being developed meets the government's standards as well as user requirements and is accepted by all stakeholders.

1 INTRODUCTION

1.1. Background

The Department of Public Sector Investment Planning, previously the Department of Economic Affairs and Public Sector Investment Planning was restructured in 2022 with the newly formed Department focusing solely on oversight of the Public Sector Investment Programme which includes all the capital projects executed by the Government of St. Kitts and Nevis, and reporting on the progress of National Development Agenda. The Public Sector Investment Programme currently comprises of 150 projects being executed across 25 Government Ministries with a total estimated value of 1.5 billion Eastern Caribbean Dollars (Government of St. Kitts and Nevis, 2023).

Capital projects, according to Tristancho (2023), are large, long-term investments such as the construction of buildings or facilities, and the improvement of infrastructure such as roads or railways. With St. Kitts and Nevis being a Small Island Development State (SIDS) with very little diversity in the economy, capital projects must undergo a vigorous process of prioritization, which is often based on the country´s national priorities at the time. Since not all proposed projects can be funded in a given year, it is necessary for the projects that are funded to be managed effectively and efficiently.

Key to the effectiveness and efficiency of managing a project and its overall success is good project monitoring and tracking of results. This is supported by Kastanoulia et. al. (2011) who state that since public sector projects can be easily impacted by political and economic changes, performance tracking and monitoring is crucial for success, and Mkele

and Dida (2020) who state that by strengthening monitoring and evaluation systems, organizations can see improvements in their performance, effectiveness, and overall achievement of project results. This is further supported by the study conducted by Gachiri et al. (2024), which demonstrated the crucial role of the systematic collection and analysis of project information during the monitoring process to track the progress of the project, identify areas of improvement, and ultimately ensure the project is successfully implemented (Gachiri et al., 2024).

Given that the Department of Public Sector Investment Planning is responsible for monitoring and reporting on the progress of these projects, it is necessary for the Department to be equipped with the necessary project management tools that enable it to do so effectively.

1.2. Statement of the problem

At the Department of Public Sector Investment Planning, no specialized project management tools are incorporated into the day-to-day operations of the Department. Officers tasked with oversight of the monitoring of and reporting on capital projects of specific line ministries often encounter challenges during the process due to the lack of a streamlined and modernized system. Firstly, basic data for capital projects is compiled into a simple spreadsheet once the project is approved for implementation. Data on expenditure and implementation progress is not reported in a proper system by the executing ministries but is rather collected via personal communication such as email, and then entered into the capital expenditure database. The analysis of a project's performance is done manually, and

there is no tool that is used for monitoring the project´s progress against the original timeline and budget. Reports are prepared manually as well, since there is no tool that generates reports on performance and expenditure. Once a report is prepared, it is then disseminated to the relevant Ministries and the Cabinet of Ministers via email.

As it currently stands, the current system for monitoring and reporting does not allow for efficient and effective monitoring of project performance. Tools such as Project Management Information Systems (PMIS) are known to improve project monitoring as they can be developed with features that allow for data to firstly be entered easily and seamlessly. This will allow for the Ministries implementing capital projects to upload the required data as opposed to having officers send the information via email, and then having officers from PSIP enter the data into their database. PMISs may also have features that allow for the monitoring of performance against the original timelines and monitoring of expenditure. It can allow for the automatic dissemination of alerts in cases where projects are delayed, underspent, or over budget, and it reduces the time it takes for an individual to analyze the data. PMISs like Projectmanager use a dashboard that presents a high-level overview of the capital project, displaying metrics such as cost and time in easy-to-read and interpret visuals such as graphs and charts (Tristancho, 2023). PMISs also reduce the time required and the burden associated with writing long reports as they easily generate reports and can allow for the customization of reports, for example, sorting or collating capital project expenditure by a ministry or ministries based on the year started or the type of capital project. Lastly, a PMIS can make the sharing and dissemination of reports simple.

Having recognized the need for a modernized system, the Department of PSIP secured funding to develop a tool/platform to monitor capital project performance and improve reporting, however they lack a management plan to guide the development of the tool/platform. In the absence of a project management plan, the Department of PSIP runs the risk of not being able to ensure the project is completed within budget and on time.

1.3. Purpose

The purpose of this Final Graduation Project is to support the Department of Public Sector Investment Planning in developing a tool or platform to improve the monitoring of and reporting on capital projects within budget and on time. The FGP is built on the Hypothesis that it is possible to create a Project Management Information System (PMIS) that can host information on all public sector projects and allow for the effective monitoring and tracking of each project so that the Department of Public Sector Investment Planning can fulfil its mandate. To create this PMIS, a project management plan is crucial as project management plans are the foundation for any project and describe how the project will be executed, monitored, and controlled (Project Management Institute, 2017).

1.4. General objective

To develop a project management plan in compliance with the standards outlined by the Project Management Institute, to establish a Project Management Information System (PMIS) for effective project monitoring at the Department of Public Sector Investment Planning in St. Kitts and Nevis.

1.5. Specific objectives

1. To create a Project Charter that outlines the project´s goals and objectives, scope, and resources.
2. To develop a scope management plan that defines the work required to successfully complete the Project Management Information System.
3. To formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed, monitored and managed, and ensures that the project activities will be delivered on time.
4. To develop a cost management plan that outlines how costs for the Project Management Information System will be estimated, managed and monitored to avoid cost overruns.
5. To create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed.
6. To develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed, and monitored throughout the project.
7. To create a communication plan that outlines how information regarding the Project Management Information System will be effectively communicated to them.
8. To formulate a risk management plan that identifies all potential project risks and the actions required to manage them.

9. To create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for the Project Management Information System.
10. To design a stakeholder management plan that identifies project stakeholders and effective strategies for their engagement and buy-in.

2 THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

The Department of Public Sector Investment Planning within the Ministry of Sustainable Development is responsible for appraising capital projects and analyzing capital expenditure. This is for the overall preparation and monitoring of the Public Sector Investment Programme which encompasses all of the public sector´s projects and programmes that are implemented strategically and in coordination with the Ministry of Finance, other domestic funding partners as well as external funding partners including but not limited to the Caribbean Development Bank (CDB), United Nations Development Programme (UNDP), World Bank (WB), Green Climate Fund (GCF), and Ibero-America South-South Cooperation.

2.1.2 Mission and vision statements

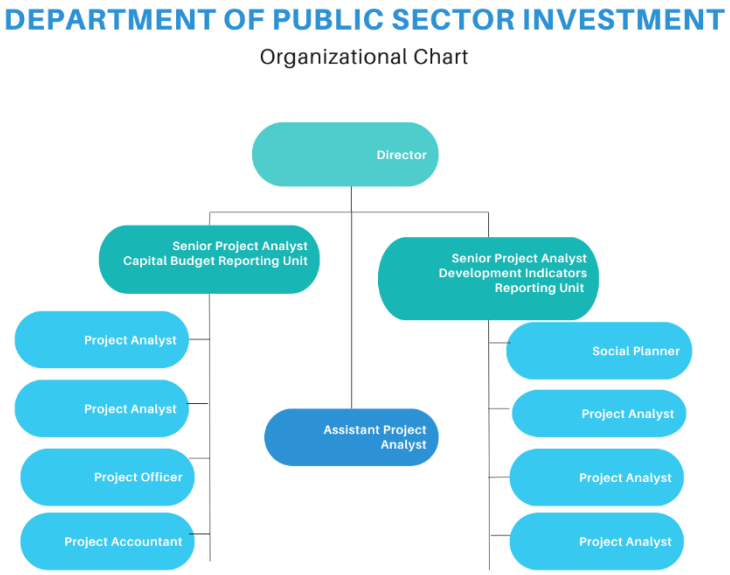
The mission of the Department of Public Sector Investment Planning is “to maintain strategic oversight of the country’s Public Sector Investment Programme which includes ongoing and pipeline initiatives (to be) implemented by government ministries, publicly-owned entities and donor partners, in partnership with civil society and the private sector” (Department of Public Sector Investment Planning, 2024). The FGP contributes to the achievement of their mission as the project´s management plan will ensure that the project management information system is designed to add value to the institution and will ultimately transform the way the Public Sector Investment Programme is managed.

2.1.3 Organizational structure

The Department of Public Sector Investment Planning is comprised of 12 staff and is headed by the Director of Public Sector Investment Planning. The Director is supported by staff which includes a Project Accountant, a Project Officer, five (5) Project Analysts, a Social Planner, two (2) Senior Project Analysts, and an Assistant Project Analyst.

Figure 1.

Organizational structure (Source: Authur, Nikkita Browne, 2024)



Note: Organizational structure of the Department of Public Sector Investment Planning as compiled by the author.

2.1.4 Products offered

The main product offered by the Department of Public Sector Investment Planning is planning, oversight, and reporting on the Public Sector Investment Programme in

coordination with all other government departments and ministries. This is key to the functioning of the Government of St. Kitts and Nevis and the investment it makes in national development, and therefore requires collaboration and communication between different units within the public sector. The relationship with this FGP project can then be seen as this project management plan for the development of a project management information system will help to improve processes for the monitoring of and reporting on projects and programmes of the Public Sector Investment Programme.

2.2 Project Management Concepts

2.2.1 Project management principles

Project Management Institute (2021) describes twelve (12) principles that should guide project management processes. Once followed, it is believed that projects will be successful.

Figure 2.

Project Management Principles

Note: The 12 project management principles, Taken from 12 Principles of Project Management, Kumar, 2024.

According to the Project Management Institute´s twelve (12) principles of project management, the following are most applicable to developing the PMIS for the Department of PSIP:

1. Stewardship – During the development of the PMIS, the project manager will act responsibly and carry out activities of the project with integrity, care, and trustworthiness, all while ensuring that the project complies with internal and external guidelines.

2. Stakeholders – Because stakeholders are critical to any project´s success, the project manager must engage stakeholders proactively during the execution of the project to the extent required.
3. Value – To achieve the intended benefits and value of the PMIS project, the project manager will focus on the benefits that the PMIS will provide to the Department of PSIP and continuously evaluate the project to ensure it is aligned with their needs.
4. Tailoring – This principle recognizes that each project is unique, therefore, the project development approach must be tailored to the context of the project. For the PMIS project, the needs of the Department of PSIP and the country as a whole are considered, and the project management plan for the project management information system will be developed with that in mind.
5. Quality – In the development of the PMIS project, the author will ensure that the quality requirements are met and that results are aligned with the project objectives and needs of the Department of PSIP.

The implementation of these project management principles within the Final Graduation Project would ensure that the project is developed in such a way that it ensures the success of the project.

2.2.2 Project management performance domains

According to the Project Management Institute (2021), Project Management Performance Domains can be defined as a group of interrelated and interdependent activities that work together as a unit to ensure the desired project outcomes are achieved.

The eight (8) performance domains described by the Project Management Institute (2021) are as follows:

- Stakeholder Performance Domain - This addresses activities and functions related to stakeholders, such as positive working relationships and effective stakeholder engagement which contributes to increased stakeholder satisfaction and successful project outcomes.
- Team Performance Domain – This focuses on strengthening the working environment and the culture of the team responsible for the delivery of the project so that the team can perform at a high level and achieve the project outcomes.
- Development Approach and Life Cycle – This focuses on the establishment of the best or most appropriate development approach, cadence, and life cycle phases of the project such that project outcomes are optimized.
- Planning Performance Domain – This addresses activities and functions associated with the organization and coordination of a project from inception and during implementation, while remaining adaptable, in order to achieve project deliverables and outcomes.
- Project Work Performance Domain – This focuses on those actions that ensure project processes and resources are managed effectively to improve the project team's performance and positively influence the delivery of the deliverables and outcomes.

- Delivery Performance Domain - This focuses on those activities and functions that ensure that the scope and quality requirements are met so that the intended outcomes can be achieved.
- Measure Performance Domain – This relates to the activities for assessing project performance and implementing appropriate corrective responses required for optimal project performance.
- Uncertainty Performance Domain – This focuses on activities to identify, assess, and determine the most appropriate response to minimize project risks and uncertainty.

This PMIS project being developed takes into account the project management performance domains to achieve the objectives. For example, the development of the stakeholder management plan will utilize the Stakeholder Domain, while the scope and schedule management plans will be guided by the Planning Performance Domain, and the Development Approach and Life Cycle Performance Domain. The quality management plan will be guided by the Delivery Performance Domain and Measure Performance Domain, while the Risk management plan will utilize the Uncertainty Performance Domain.

2.2.3 Predictive, adaptive, and hybrid projects

The three main approaches to project management can be described as predictive, adaptive, and hybrid. According to Iqbal (2023), in the predictive approach, also referred to as the traditional or waterfall approach, aspects of the project management plan, such as schedule, budget, and deliverables, are defined at the start of the project, and the plan is

adhered to throughout the lifecycle of the project. This approach is best used for projects that have clearly defined goals, requirements, and scope that are unlikely to change. The characteristics of predictive projects described by Leonelli (2024) are as follows:

- Single development cycle: The project is planned as one cycle, where one stage must conclude before another commences.
- Limited responsiveness to change: There is little flexibility to respond to changes outside of the change management process without causing a major disruption to the plan.
- Focus on budget and time: The focus is on managing the budget and time in accordance with the clearly defined scope.

The adaptive approach, also referred to as the agile or iterative approach, occurs where there is flexibility that allows for changes to the project plans or project/product requirements based on feedback from stakeholders (Iqbal, 2023). This approach is best used when there is a high degree of uncertainty or the environment is rapidly changing, requiring the requirements to change in order to stay up to date. The characteristics of adaptive projects described by Leonelli (2024) are as follows:

- Iterative development cycles: Projects are broken down into small iterations through which a functional product increment is developed at the end of each iteration.
- High responsiveness to change: There is flexibility as changes in the requirements can easily be incorporated into the process.
- Focus on value and quality: The focus is on value delivery, so the quality of the products developed at each iteration is most important.

The hybrid approach is a combination of aspects of both predictive and adaptive approaches so that the advantages of each can be utilized to overcome those aspects that may be disadvantageous (Leonelli, 2024).

This project management plan for the development of a project management information system will utilize a hybrid approach, as the requirements, including scope, schedule, and cost, will be defined at the start of the project, as seen in the case of predictive approaches.

2.2.4 Project management

Project management is defined as "the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements" according to Project Management Institute (2021). It is within this context and framework that every aspect of a project can be planned and executed, taking into account the project management knowledge areas and processes to achieve a desirable outcome.

2.2.5 Project management knowledge areas and processes

In project management, there are 10 knowledge areas that are key components of project management that must be considered and managed by project managers from the start to the end of the project. The ten (10) project management knowledge areas according to the Project Management Institute (2017) are:

1. Project integration management: This includes the processes and activities to help identify, define, integrate, and coordinate the different project activities and processes within the five (5) project management process groups.

2. Project scope management: This includes the processes required to ensure all the tasks required to complete the project are accounted for while disregarding unnecessary tasks.
3. Project time management: This includes the processes required to ensure the project is completed within the given timeframe.
4. Project cost management: This includes the processes for ensuring the project is completed within the approved budget and involves planning, estimating, budgeting, mobilizing financing and funding, managing, and controlling costs.
5. Project quality management: This includes the processes to ensure project or product quality requirements are met, and stakeholders are satisfied with the results. It involves planning, managing, and controlling project and product quality requirements
6. Project resource management: This includes the processes to identify, obtain, and manage the resources that are required to complete the project.
7. Project communications management: This includes the processes required to ensure project information is planned, created, disseminated, managed, controlled and monitored effectively and efficiently.
8. Project risk management: This includes the processes required to identify, respond to, and monitor project risks.
9. Project procurement management: This includes the processes required to obtain goods, services, or results external to the project team but nonetheless required to complete the project.

10. Project stakeholder management: This included the processes required to identify all the stakeholders that could either impact or be impacted by the project and to determine how they will be engaged depending on the expectations and influence on project activities.

The project management process groups, on the other hand, are those processes that are required to fulfill the project requirements by meeting the objectives. The five (5) process groups include the initiating process group where a new project is defined, the planning process group where elements such as the scope and actions to achieve the project objectives are defined, the executing process group where tasks defined are then executed to achieve the requirements of the projects, the monitoring and control process group where aspects of the project that requires changes are identified and changes are initiated, and the closing process group where the project is formally close (Project Management Institute, 2017).

All the knowledge areas are incorporated into the PMIS project, while the project encompasses only the initiating and planning process groups.

2.2.6 Project life cycle

The project life cycle can be defined as the series of stages that every project goes through from start to finish (Project Management Institute, 2017). The main types of project life cycles are predictive or linear, adaptive or iterative, and hybrid.

1. In predictive life cycles, project teams place much emphasis on planning the scope, cost, and time of the project in the early stages of the life cycle.

Figure 3.

Predictive life cycle

Note: A diagrammatic representation of the stages of a predictive life cycle in project management, Taken from Project Lifecycle: Definition and Types with Examples, Khateeb, 2022.

2. In adaptive life cycles, the life cycle is repeated several times as iterations are developed in each cycle, and the cycle repeats until the scope of work has been achieved (Khateeb, 2022).

Figure 4.

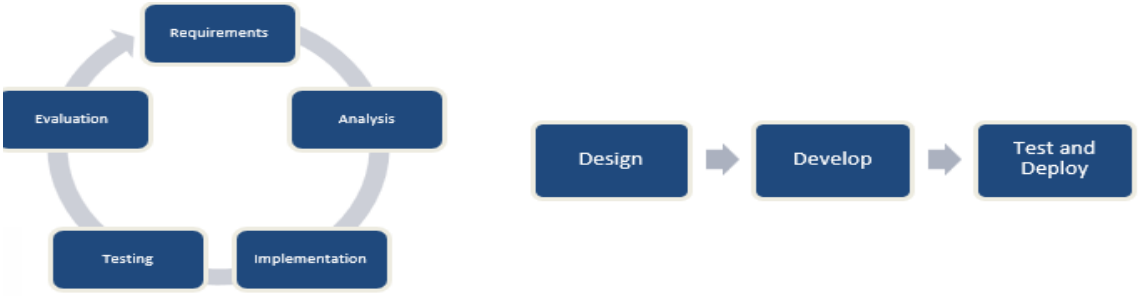
Adaptive life cycle

Note. A diagrammatic representation of the different stages of an adaptive life cycle in project management, taken from Project Lifecycle: Definition and Types with Examples, Khateeb, 2022.

3. In hybrid life cycles, there are a combination of two or more different types of life cycles (Khateeb, 2022).

Figure 5.

Hybrid life cycle.



Note: A diagrammatic representation of a hybrid life cycle in project management, Taken from, Project Lifecycle: Definition and Types with Examples, Khateeb, 2022.

The PMIS project follows the predictive life cycle as key aspects of the project will be planned at the start, and the progression of the project will be linear with no iterations and without integration of any other type of project life cycle.

2.2.7 Company strategy, portfolios, programs, and projects

According to the Project Management Institute (2017), a portfolio refers to the group of projects and programs managed collectively to achieve the strategic objectives of an institution, while programs are the group of related projects managed collectively, as that is the only way they support the portfolio. Projects are a combination of tasks that are to be completed within a defined period and are designed to accomplish a particular goal. For any institution to be successful, the organization's strategy must ensure that the

projects, programs, and portfolios are aligned towards a common goal (Project Management Institute, 2017).

It is important for this project management plan to support the Department of PSIP in its overall strategy, as the PMIS is designed to improve the way the department functions and achieves its mandate as it relates to oversight of capital projects.

2.3 Other applicable theories/concepts related to the project topic and context

2.3.1 Current situation of the problem or opportunity in the study

The Department of PSIP currently has 150 projects that are being monitored by the six staff members of the Capital Budgeting Reporting Unit (PSIP, 2024). Data is collected from the different line ministries regarding the expenditure and progress of projects and entered into a simple project database. A simple capital projects status report is generated using Microsoft Excel on a monthly basis, while a capital expenditure table is updated monthly, and a capital expenditure forecast is updated quarterly. All data on capital expenditure is analyzed quarterly, and a report is produced and shared with external stakeholders.

The need for the development of a tool/platform that can house information on all past, present and upcoming capital projects, organize projects based on different criteria, facilitate effective monitoring and tracking of the performance of the capital projects and progress towards achieving development indicators using user-friendly dashboards, assist with the data analysis, and easily generate comprehensive reports on their large portfolio of

projects and programs has long been recognized, and because of this, the Department of PSIP had sought and was successful in securing funding to develop a monitoring tool/platform.

This project management plan to develop a project management information system will benefit the Department of PSIP, as it can be used as a guide for the process to be embarked upon to develop a monitoring tool/platform using donor-secured funding.

2.3.2 Previous research done for the topic in the study

There is no evidence that there has been any research done on the topic of study at the Department of PSIP or any other government department or ministry in St. Kitts and Nevis.

2.3.3 Other theories related to the topic in the study

Other theories related to the study topic include perceptions of project management information systems and the likelihood of uptake. A project management information system (PMIS) can be simply defined as a tool that collects and uses information about a project. In the context of managing projects, project managers can plan, execute, monitor, and control projects efficiently, and according to Micale et. al (2021), project managers who work in markets considered to be competitive have found PMISs to be useful when planning, organizing as well as controlling complex projects. The earliest record on a PMIS dates back to the year 2001 when Avantis´ Project Management Office (PMO) developed a database system that allowed them to gather and update project information, after which information could be communicated to stakeholders (Bondale, 2002).

Since earlier versions of a PMIS, much has evolved, and today, Project Management Information Systems are widely recognized for their ability to enhance project scheduling, resource management, budgeting, tracking, and reporting (Keup, 2022). Different types of PMIS exist, and these tools can be created or modified to suit the needs of end users.

For the Department of Public Sector Investment Planning, a PMIS has all the attributes desirable for them to mechanize processes for tracking project progress, monitoring expenditure, and generating reports in what could be considered to be the most efficient manner. Indeed, a PMIS will greatly benefit the Department of PSIP, but the process for implementation of this project must however be done carefully. A study by Ilyas et al. (2013) to assess the effectiveness of PMIS in managing complex projects recognized the need for developers to work closely with the end users to develop tools that meet the needs of end users and the need for training on the use of features of the tools.

Key aspects of a project management plan to develop the PMIS for the Department of PSIP are scope management, quality management, stakeholder management, and risk management. If implemented effectively, it would ensure stakeholders´ acceptance and will in the long term, improve the Department's ability to fulfill its mandate.

3 METHODOLOGICAL FRAMEWORK

The methodological framework of this project describes the research methods utilized to develop the project. Here, the primary and information sources, types of research methods, and tools used during its development of the are described. Additionally, the assumptions and constraints identified are presented.

3.1 Information sources

Information sources can be simply described as those sources used to provide information when conducting research (George, 2023). The develop this PMIS project, primary and secondary sources are considered and described below.

3.1.1 Primary sources

Primary sources are those sources that give a first-hand account from individuals involved in an event or provide original data on a particular subject matter (George, 2023). Examples of primary sources include information from interviews and surveys, speeches, newspaper articles, and original research. Primary sources used in this FGP are mainly from interviews, meetings, and other forms of personal communication, as there are very few original works created in St. Kitts and Nevis pertaining to the subject matter.

3.1.2 Secondary sources

Secondary sources are those sources of information derived from primary sources and have been summarized, interpreted, analyzed, or described by someone other than the original author (George, 2023). Examples include reviews, articles, summaries, or analyses

of research conducted on a particular topic or idea. The secondary sources of information used for the FGP documents on project management standards, internet articles, journal articles, books, and reports from reputable institutions.

Table 1.

Information sources

Objectives	**Information sources**	
	Primary	**Secondary**
1. To create a Project Charter that outlines the project´s goals and objectives, scope, and resources.	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP, and Documents produced by the Department of PSIP.	Project Management standards.
2. To develop a scope management plan that defines the work required to successfully complete the PMIS.	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP.	Project Management standards. Journal articles Internet sources
3. To formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed, monitored and managed, and	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP and Expert knowledge.	Project Management standards. Journal articles Internet sources

Objectives	Information sources	
	Primary	**Secondary**
ensures that the project activities will be delivered on time.		
4. To develop a cost management plan that outlines how costs for the Project Management Information System will be estimated, managed and monitored to avoid cost overruns.	Expert knowledge.	Project Management standards. Internet sources
5. To create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed.	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP and Expert knowledge.	Project Management standards. Internet sources
6. To develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed, and monitored throughout the project.	Interviews and meetings with relevant stakeholders including but not limited to staff members at the Department of PSIP and Expert knowledge.	Project Management standards. Internet sources
7. To create a communication plan that outlines how information regarding the Project Management Information	Meetings with relevant stakeholders including but not limited to staff members at the Department of PSIP and	Project Management standards. Journal articles Internet sources

Objectives	Information sources	
	Primary	**Secondary**
System will be effectively communicated to them.	Expert knowledge.	
8. To formulate a risk management plan that identifies all potential project risks and the actions required to manage them.	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP and Expert knowledge.	Project Management standards. Journal articles Internet sources
9. To create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for the PMIS.	Expert knowledge	Project Management standards. Internet sources
10. To design a stakeholder management plan that identifies project stakeholders and effective strategies for their engagement and buy-in.	Meetings with relevant stakeholders including but not limited to staff members at the Department of PSIP and Expert knowledge.	Project Management standards. Internet sources

Note: A table describing all the information sources, Compiled by the author.

3.2 Research methods

Research methods are those strategies, processes, or techniques used to collect data or evidence in order to conduct analysis when doing research (University of Newcastle

Library, 2023). There are several types of research methods, however, depending on the research being undertaken and the data requirements, specific research methods are used. For the development of the PMIS project, qualitative, quantitative, and mixed research methods are utilized and are described below and summarized in Table 2.

3.2.1 Qualitative research methods

Qualitative research methods are used to gather data based on real-life experiences of others, and allow researchers to gain insight into the how or why different concepts or phenomena occur (University of Newcastle Library, 2023). Qualitative tools or techniques include interviews, focus groups, observation, and document analysis (University of Newcastle Library, 2023).

3.2.2 Quantitative Research Methods

Quantitative research methods gather numerical data, which can then undergo statistical analysis in order to identify or explain patterns or relationships that are observed (University of Newcastle Library, 2023). Quantitative tools or techniques include surveys or questionnaires, observation, document screening, or experiments (University of Newcastle Library, 2023).

3.2.3 Mixed Research Methods

Mixed Methods Research combines both qualitative and quantitative research methods, providing a more holistic approach, and allowing for the data from two or more sources to be verified (University of Newcastle Library, 2023).

Table 2.

Research methods

Objectives	**Research methods**		
	Qualitative	Quantitative	Mixed
1. To create a Project Charter that outlines the project´s goals and objectives, scope, and resources.	Information will be obtained from document analysis and interviews.		
2. To develop a scope management plan that defines the work required to successfully complete the PMIS.	Information will be obtained from document analysis and interviews.		
3. To formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed, monitored, and managed, and ensures that the project activities will be delivered on time.			Information will be obtained from document analysis and interviews and existing numerical data from similar projects.
4. To develop a cost management plan that			Information will be obtained from

Objectives	Research methods		
	Qualitative	Quantitative	Mixed
outlines how costs for the Project Management Information System will be estimated, managed and monitored to avoid cost overruns.			document analysis and interviews and existing numerical data from similar projects
5. To create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed.	Information will be obtained from document analysis, and interviews.		
6. To develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed, and monitored throughout the project.	Information will be obtained from document analysis, and interviews.		

Objectives	Research methods		
	Qualitative	Quantitative	Mixed
7. To create a communication plan that outlines how information regarding the Project Management Information System will be effectively communicated to them.	Information will be obtained from document analysis and observation.		
8. To formulate a risk management plan that identifies all potential project risks and the actions required to manage them.	Information will be obtained from document analysis and interviews.		
9. To create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for the PMIS.		Numerical data from similar projects will be used.	
10. To design a stakeholder management plan that identifies project stakeholders and	Information will be obtained from document analysis and		

Objectives	Research methods		
	Qualitative	Quantitative	Mixed
effective strategies for their engagement and buy-in.	interviews.		

Note: A table describing all the research methods utilized for each objective of the project, as compiled by the author.

3.3 Tools

In project management, tools as well as techniques can be applied during the project management process in order to produce an output. The main project management tools utilized to accomplish the objectives of the PMIS project are as follows:

Expert Judgement

- Expert judgment – using or applying expertise in a discipline to fill gaps necessary to develop the project management plan (Project Management Institute, 2017).

Data Gathering

- Interview – talking with or asking questions and recording responses based on conversations with knowledgeable stakeholders or subject matter experts to obtain information required to develop the project management plan (Project Management Institute, 2017).
- Benchmarking – comparing actions or activities of the project management plan with those of similar projects in order to gain ideas that would help to improve the project management plan (Project Management Institute, 2017).

- Checklist - a listing of items or points developed using historical information from similar projects or other sources, and used to track or ensure requirements are completed when developing the project management plan (Project Management Institute, 2017).

Data Analysis

- Decomposition - dividing and further subdividing the scope to the work package level, making it easier to estimate cost and duration when developing the project management plan (Project Management Institute, 2017).
- Project Management Information System – this includes software that enables the user to plan and organize project activities in a sequence and estimate project duration when developing the project management plan (Project Management Institute, 2017).
- Cost aggregation – breaking down components of the project into work packages and then aggregating the cost estimate of each work package to estimate the cost for the higher-level component and the cost of the entire project when developing the project management plan (Project Management Institute, 2017).
- Analogous Estimating - a technique that uses historical data that exists for similar projects or activities in order to estimate the duration or cost of an activity when developing the project management plan (Project Management Institute, 2017).
- Document Analysis - reviewing relevant information that has been documented in order to identify information relevant to meeting the requirements of the project management plan.

- Stakeholder Analysis - developing a stakeholder list with the relevant information, including but not limited to their role in the project, expectations, level of interest, and level of support for the project when developing a project management plan (Project Management Institute, 2017).
- Root Cause Analysis – a method used to identify potential risks that may lead to a problem, and allows for the development of preventive action when developing a project management plan (Project Management Institute, 2017).
- Risk Probability and Impact Assessment – an assessment conducted when developing a project management plan to determine the prioritized risks when considering the likelihood of each risk occurring and the potential impact each would have (Project Management Institute, 2017).

Communication

- Communication Technology - used to exchange information or facilitate collaboration between project stakeholders (Project Management Institute, 2017).

Communication Requirements Analysis

- Communication Requirements Analysis – used to identify the information requirements of project stakeholders when developing a project management plan (Project Management Institute, 2017).

Data representation

- Responsibility Assignment Matrix - a visual representation of the link or connection between the activities or work packages and the project team

members/project resource assigned to execute it (Project Management Institute, 2017).

Meetings

- Meeting – planned session with more than one knowledgeable stakeholder or subject matter expert to gather or validate data for the project management plan.

Table 3.

Tools

Objectives	**Tools**
1. To create a Project Charter that outlines the project's goals and objectives, scope, and resources.	Interviews Meetings Expert Judgement Document Analysis
2. To develop a scope management plan that defines the work required to successfully complete the PMIS.	Expert Judgement Document Analysis Interviews Benchmarking
3. To formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed, monitored and managed, and ensures	Expert Judgement Decomposition PMIS (Microsoft Project) Analogous Estimating

Objectives	Tools
that the project activities will be delivered on time.	Document Analysis Interviews
4. To develop a cost management plan that outlines how costs for the Project Management Information System will be estimated, managed and monitored to avoid cost overruns.	Expert Judgement Analogous Estimating Document Analysis Cost Aggregation
5. To create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed.	Expert Judgement Interviews Meetings Document Analysis
6. To develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed, and monitored throughout the project.	Expert Judgement Responsibility assignment matrix Document Analysis Analogous Estimating Interviews
7. To create a communication plan that outlines how information regarding the Project Management Information System will be effectively communicated to them.	Expert Judgement Meetings Communication Requirements Analysis

Objectives	Tools
	Communication Technology
8. To formulate a risk management plan that identifies all potential project risks and the actions required to manage them.	Expert Judgement Document Analysis Checklist Interviews Root cause analysis Risk Probability and Impact Assessment
9. To create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for the PMIS.	Expert Judgement Document Analysis Data gathering
10. To design a stakeholder management plan that identifies project stakeholders and effective strategies for their engagement and buy-in.	Expert Judgement Stakeholder Analysis Document Analysis Interviews

Note: A table describing all the tools utilized for the project as compiled by the author.

3.4 Assumptions and constraints

An assumption is a condition considered to be true in the absence of evidence (Project Management Institute, 2024, p.174). It is important to note, however, that assumptions should

be reviewed during the project, and if they are proven to be true or false, project plans should be adjusted accordingly (Deshmukh, 2021). A constraint on the other hand is a factor that limits or affects the chances of success in a project (Project Management Institute, 2024, p.174).

The assumptions and constraints considered for each specific objective of the FGP are presented below in Table 4.

Table 4.

Assumptions and constraints

Objectives	**Assumptions**	**Constraints**
1. To create a Project Charter that outlines the project's goals and objectives, scope, and resources.	The project charter will be created first and will guide the development of the overall project management plan.	The data available to complete the project charter lacks depth as it is developed before the project is fully formulated.
2. To develop a scope management plan that defines the work required to successfully complete the PMIS.	All information required to complete the scope management plan is available.	The lack of data available to adequately build out the project's scope if the needs of the stakeholders are not fully understood.
3. To formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed,	The duration of activities will be adequately estimated in order to achieve this objective.	The lack of data specific to the proposed PMIS that can provide accurate estimates of the time

Objectives	Assumptions	Constraints
monitored, and managed, and ensures that the project activities will be delivered on time.		required to complete each activity.
4. To develop a cost management plan that outlines how costs for the Project Management Information System will be estimated, managed, and monitored to avoid cost overruns.	The costs will be adequately estimated using available data on similar systems used in other parts of the world in order to achieve this objective.	The lack of local data to provide accurate estimates of the cost required to complete each activity.
5. To create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed.	The quality requirements will be understood, and the design will be sufficient to adequately manage the project´s quality.	There are limited human resources to implement quality control processes within a short timeframe.
6. To develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed, and monitored throughout the project.	The resources will be adequately identified in order to develop the plan for resource management.	The lack of specific data regarding resource requirements for the proposed PMIS.
7. To create a communication plan that outlines how information regarding the Project Management Information System will be effectively communicated to them.	The communication requirements will be adequately understood in order to achieve this objective.	The lack of formal policies governing information sharing within government institutions.

Objectives	Assumptions	Constraints
8. To formulate a risk management plan that identifies all potential project risks and the actions required to manage them.	All the risks and the appropriate measures to address them will be understood in order to achieve this objective.	Incomplete data resulting in a lack of understanding of all the risks involved..
9. To create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for the PMIS.	The procurement requirements are known, and all the processes for the procurement of goods and services will be adequately defined.	Limited data available regarding local procurement policies.
10. To design a stakeholder management plan that identifies project stakeholders and effective strategies for their engagement and buy-in.	All the relevant stakeholders can easily be identified and mapped in order to achieve this objective.	Difficulty aligning all the stakeholders' needs with project objectives.

Note: A table describing the assumptions and constraints identified and compiled by the author.

3.5 Deliverables

The Project Management Institute (2017) describes deliverables as tangible or intangible products or results that can be verified and signal the completion of activities or a phase of a project. It is important to note however, that deliverables should be well-defined and should be specific, measurable, time-bound, client-oriented, and quality-

focused (Suslov, 2023). The summary of the deliverables for each of the objectives associated with the FGP is provided in Table 5 below.

Table 5.

Deliverables

Objectives	**Deliverables**
To create a Project Charter that outlines the project´s goals and objectives, scope, and resources.	A project charter that initiates the project and concisely presents the goals and objectives, scope, and resources of the project
To develop a scope management plan that defines the work required to successfully complete the PMIS.	A scope management plan that clearly defines only the work required to complete the PMIS and the WBS.
To formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed, monitored, and managed, and ensures that the project activities will be delivered on time.	A schedule management plan that includes a list of activities sequenced, and their duration.
To develop a cost management plan that outlines how costs for the Project Management Information System will be estimated, managed, and monitored to avoid cost overruns.	A cost management plan outlines all estimated cost items and the overall budget of the project to develop the PMIS.
To create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed.	A quality management plan outlining the required standards and the process for maintaining project quality.
To develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed, and monitored throughout the project.	A resource management plan that outlines the resources to be acquired, responsibility assignments, and the process for their management and monitoring.
To create a communication plan that outlines how information regarding the Project Management Information System will be effectively communicated to them	A comprehensive communication management plan that defines the frequency of communication and its purpose.

Objectives	Deliverables
To formulate a risk management plan that identifies all potential project risks and the actions required to manage them.	A risk management plan, inclusive of the RBS structure and probability and impact matrix.
To create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for the PMIS.	A procurement plan, inclusive of all the procurement processes required, the types of procurement processes, and contract types.
To design a stakeholder management plan that identifies project stakeholders and effective strategies for their engagement and buy-in.	A stakeholder management plan that identifies all the stakeholders and maps them using the power-interest grid.

Note: A table describing all the deliverables of the Final Graduation Project, as compiled by the Author.

4 RESULTS

4.1 Project Charter

The project charter is defined as a formal document that recognizes the existence of the project, and gives authorization to the project manager to utilize organizational resources to execute the project´s activities (PMI 2017). The development of the project charter in the initiation phase or project planning stage is necessary to communicate the goals and objectives of the project while also identifying the timeframe, resources required, assumptions, risks, and constraints, all of which are important considerations for developing the PMIS project. Additionally, for the PMIS project, the information used to develop the Project Charter was gathered from interviews, meetings with staff at the department of PSIP, analysis of government documents and PSIP reports, and using expert judgment.

Table 6.

Project Charter

PROJECT CHARTER	
Date	**Project Name**
January 10, 2025	The Development of a Project Management Information System (PMIS) for the Department of Public Sector Investment Planning in St. Kitts and Nevis
Knowledge Areas / Processes	**Application Area (Sector / Activity)**
Knowledge areas: 1. Project Integration Management 2. Project Scope Management	Public Sector/Sustainable Development – Software Application Development

<table>
<tr><td colspan="2">3. Project Time Management
4. Project Cost Management
5. Project Quality Management
6. Project Resource Management
7. Project Communications Management
8. Project Risk Management
9. Project Procurement Management
10. Project Stakeholders Management

Process groups:
1. Initiation
2. Planning
3. Executing
4. Monitoring & Controlling
5. Closing</td><td></td></tr>
<tr><td>Start Date</td><td>Finish Date</td><td>Duration</td></tr>
<tr><td>March 24th 2025</td><td>May 28th 2026</td><td>14 months</td></tr>
<tr><td colspan="3">General Objective:</td></tr>
<tr><td colspan="3">To develop a Project Management Information System (PMIS) for effective project monitoring at the Department of Public Sector Investment Planning in St. Kitts and Nevis</td></tr>
<tr><td colspan="3">Specific Objectives:</td></tr>
<tr><td colspan="3">1. Conduct a needs assessment to identify the specific needs of the Department of Public Sector Investment Planning</td></tr>
<tr><td colspan="3">2. Develop one proposal for the design of the PMIS.</td></tr>
<tr><td colspan="3">3. Design, test, and operationalize the approved PMIS as proposed.</td></tr>
<tr><td colspan="3">4. Develop a user manual for the PMIS.</td></tr>
</table>

5. Conduct a training workshop with all the relevant Departments/end users of the platform.

Justification or purpose of the project

The project is being undertaken to modernize and enhance the day-to-day operations of the Department of Public Sector Investment Planning by streamlining the processes for effective monitoring and reporting on capital projects. The existing system does not allow for synchronous or standardized data entry on capital project expenditure and implementation progress by Ministries executing capital projects, and data analysis, reporting, and dissemination is done manually. Simplifying the process for data analysis and monitoring the project´s progress against the original timeline and budget, as well as generating and disseminating reports efficiently is critical to the functioning of the Department. The incorporation of a Project Management Information System into the Department´s operation enhances their ability to monitor and track project progress and make informed decisions, thus allowing them to achieve the mandate in a more effective and efficient manner.

Description of Product or Service to be generated by the Project – Project Final Deliverables

This project will deliver a Project Management Information System which:

- Stores data and information on all past, present, and upcoming capital projects
- Allows project data or information to be organized or grouped based on different criteria
- Facilitates effective monitoring and tracking of the performance of the capital projects and progress towards achieving development indicators using user-friendly dashboards
- Facilitates easy data analysis
- Generates comprehensive reports

Assumptions

1. The resources provided by the donor will be available to execute the entire project.
2. The technical capacity to design and build the platform is available.
3. The proposed PMIS will be compatible with the existing ICT infrastructure of the Government of St. Kitts and Nevis.
4. The staff who will utilize the platform have the capacity and willingness to adjust to changes in the system.
5. The PMIS platform and training material will be easy to understand.
6. The project will be completed in eight months.

Constraints

1. The budget is limited, hence the complexity of the platform and features to be developed will be limited.
2. The project will not deliver physical equipment, so features are limited based on existing equipment within the relevant Ministries or Departments
3. Technical support after the delivery of the final product is not unlimited, and after a defined period, no further technical support will be provided.

Preliminary Risks

1. Natural disasters during the Atlantic Hurricane Season can impact the project´s ability to host training workshops, and the project may not be completed on schedule. 2. Changes in personnel at the Department of Public Sector Investment Planning can affect the software development process and could impact the sustainability of the initiative in the absence of continuous training. 3. Numerous testing and usability issues may lead to longer periods for refining the software and may lead to delays in meeting deadlines. 4. Resistance to change by end-users could impact the sustainability of the platform.	
Milestones and Dates	
Milestones	**End Date**
Project Initiation	March 24th 2025
Contract signing for a software development firm	May 30th 2025
Requirements Validation for PMIS	July 11th 2025
PMIS Proposal	August 8th 2025
Software prototype	October 17th 2025
Testing by end user	November 28th 2025
Training Manual	January 23rd 2026
Training Workshop	February 14th 2026
Final PMIS platform product	March 27th 2026
Project Closure	May 8th 2026
Budget	
The allocated budget for this project is US $187,110.00	
Stakeholders	
Direct Stakeholders: 1. The Ministry of Finance 2. The Department of Public Sector Investment Planning 3. All other Ministries that report to the Department of Public Sector Investment Planning 4. The Department of Information Technology **Indirect Stakeholders:** 1. Contractors and service providers of capital projects 2. The Cabinet of Ministers	
Project Manager: **Nikkita Browne**	**Signature:**
Authorized by:	**Signature:**

Note: A table outlining all the elements of the project charter for the project, created by the author.

4.2 Scope Management Plan

The Scope Management Planning process is a critical phase/step in ensuring that the project only includes the work required to successfully complete the project, and that no required tasks are excluded (PMI, 2017). In doing so, project resources can be used effectively and efficiently. The processes involved in the scope management plan development process include:

1. Plan scope management
2. Collect Requirements
3. Define scope
4. Create work breakdown structure
5. Validate scope
6. Control scope

4.2.1 Plan scope management

Plan Scope Management is the process by which the scope management plan is developed. The scope management plan for the project to develop the PMIS outlines the process by which the project's scope will be defined, validated, and controlled, thus providing guidance on how the scope of the project is to be managed throughout the project. The inputs for the plan scope management plan include the project charter, which provides readers with the scope, objectives, and requirements of the final product to be delivered. Additionally, organizational information can be used to determine roles and

responsibilities, and lessons learned from similar projects were inputs to the plan scope management process.

Tools used to gather information for the plan scope management process include expert judgement and meetings with staff at the Department of PSIP, document analysis to understand how the Department functions, and analysis of documents for similar projects. The output of this process is the Scope Management Plan which describes the way in which the project scope will be defined, developed, monitored, controlled, and verified for the project (PMI, 2017).

4.2.2 Collect requirements

Collect Requirements is the process by which the needs and requirements of the project's stakeholders are firstly determined, then documented and managed so that the project objectives are met (PMI, 2017). The inputs for the collect requirements phase/stage are the project charter, all documents related to the project, organizational documents, government documents, including policies for ICT use and implementation, and the project management plan or lessons learned from similar projects where PMIS were developed.

Tools such as interviews can be carried out to generate ideas about the needs and requirements of the stakeholders, while benchmarking can be used to generate ideas on how the current processes at the Department of PSIP can be improved when compared to organizations in other countries that utilize PMIS to monitor capital projects. Additionally, observation/conversation can be done to better understand how staff at PSIP perform tasks and carry out processes to monitor capital projects.

The output of the collect requirements process includes the requirements traceability matrix, which ensures those requirements that were approved and documented are delivered at the end of the project, by linking the product requirements from their origin as stated in the objectives to the deliverables (PMI, 2017).

Table 7.

Requirements traceability matrix

ID	Requirements Description	Responsibility	Verification	Priority
REQ1	The project should identify and document specific needs of the Department of Public Sector Investment Planning to monitor and track capital project implementation.	Consultant	Assessment report	High
REQ2	The project stakeholders should validate the findings of the needs assessment before a proposal for the PMIS is developed.	All project stakeholders	Agreement and confirmation by stakeholders	High
REQ3	The project should develop a proposal that describes the proposed PMIS to be developed, taking into account the data collected during the needs assessment.	Consultant	Proposal document	High
REQ4	The Project Management Information System which stores data and information on all past, present, and upcoming capital projects; allows project data or information to be organized or grouped based on different criteria; facilitates effective monitoring and tracking of the performance of the capital projects and progress towards achieving development indicators using user-friendly dashboards; facilitates	Consultant	Testing reports and feedback on the PMIS, and an approved product	High

ID	Requirements Description	Responsibility	Verification	Priority
	easy data analysis; and generates comprehensive reports			
REQ5	The Project Management Information System should be compatible with the existing infrastructure of the government.	Consultant and IT Department	Testing reports and feedback on the PMIS, and an approved product	High
REQ6	The Project Management Information System should comply with the government's security policies	Consultant and IT Department	Verification by the IT Departments	Medium
REQ7	The project should develop a guiding document that will be used to train staff to use the PMIS	Consultant	Detailed user-friendly training manual	Medium
REQ8	The project should deliver comprehensive training that builds the capacity of all staff involved in capital project monitoring and reporting	Consultant	Training report, inclusive of workshop participant evaluation/survey	High
REQ9	The project duration should not exceed 14 months	Project manager and Project Office	Project technical report	High

ID	Requirements Description	Responsibility	Verification	Priority
REQ10	The project must be completed within the budget of US $187,110.00	Project manager and Project Office	Project expenditure report	High
REQ11	The project´s Steering Committee must review and approve all project deliverables in order for a deliverable to be considered complete	PSC	Project Meeting minutes/report	High
REQ12	The project team must comprise staff from the Department of PSIP.	Project Office	Confirmation by the Director of PSIP	High
REQ13	The Department of IT must provide technical support to the process for the design of the platform	IT Department	Confirmation by the Director of the IT Department	High
REQ14	Physical resources for the project must be provided by the government as cofinancing	IT Department and Project Office	Project cofinance commitment statement by relevant departments	Medium

Note: A table describing the requirements of the project stakeholders and the means of verifying that the objectives are met, Created by the Author.

4.2.3 Define Scope

Define Scope is the process by which a detailed description of the project to be executed or product to be delivered is developed (PMI, 2017). The project's scope was defined based on consultation with staff at the Department of PSIP along with intimate knowledge of current processes for monitoring and reporting on capital projects, and efforts to secure funding to develop a PMIS. According to Gutterman (2023), the scope statement identifies the goals as well as objectives of the project, briefly describes the work expected to be completed as a narrative, and identifies constraints and limits to the project. The scope statement is described in Table 8 below.

Table 8.

Scope Statement

Project Name
The Development of a Project Management Information System (PMIS) for the Department of Public Sector Investment Planning in St. Kitts and Nevis
Project Scope Description
This project scope includes an assessment to determine the PMIS needs of the Department of PSIP and the development of a Project Management Information System which stores data and information on all past, present, and upcoming capital projects; and allows project data or information to be organized or grouped based on different criteria; facilitates effective monitoring and tracking of the performance of the capital projects and progress towards achieving development indicators using user-friendly dashboards; facilitates easy data analysis; and generates comprehensive reports. Additionally, a training guide and training are included in the scope.
Project Deliverables
Assessment report A PMIS proposal document The PMIS Platform

Detailed user-friendly training manual A training report Project Closeout Report
Project Assumptions
1. The resources provided by the donor will be available to execute the entire project. 2. The technical capacity to design and build the platform is available. 3. The proposed PMIS will be compatible with the existing ICT infrastructure of the Government of St. Kitts and Nevis. 4. The staff who will utilize the platform have the capacity and willingness to adjust to changes in the system. 5. The PMIS platform and training material will be easy to understand. 6. The project will be completed in eight months.
Project Constraints
1. The budget is limited, hence the complexity of the platform and features to be developed will be limited. 2. The project will not deliver physical equipment, so features are limited based on existing equipment within the relevant Ministries or Departments 3. Technical support after the delivery of the final product is not unlimited, and after a defined period, no further technical support will be provided.
Project Exclusions
The project is not expected to deliver hardware/computer equipment to implement the PMIS
Project Acceptance Criteria
The project will be accepted when: 1. The PMIS meets the technical requirements and is approved by the Department of PSIP. 2. The PMIS is compatible with the current ICT infrastructure of the Government of St. Kitts and Nevis. 3. Staff are trained to use the PMIS. 4. A guiding document for future training of staff is delivered.

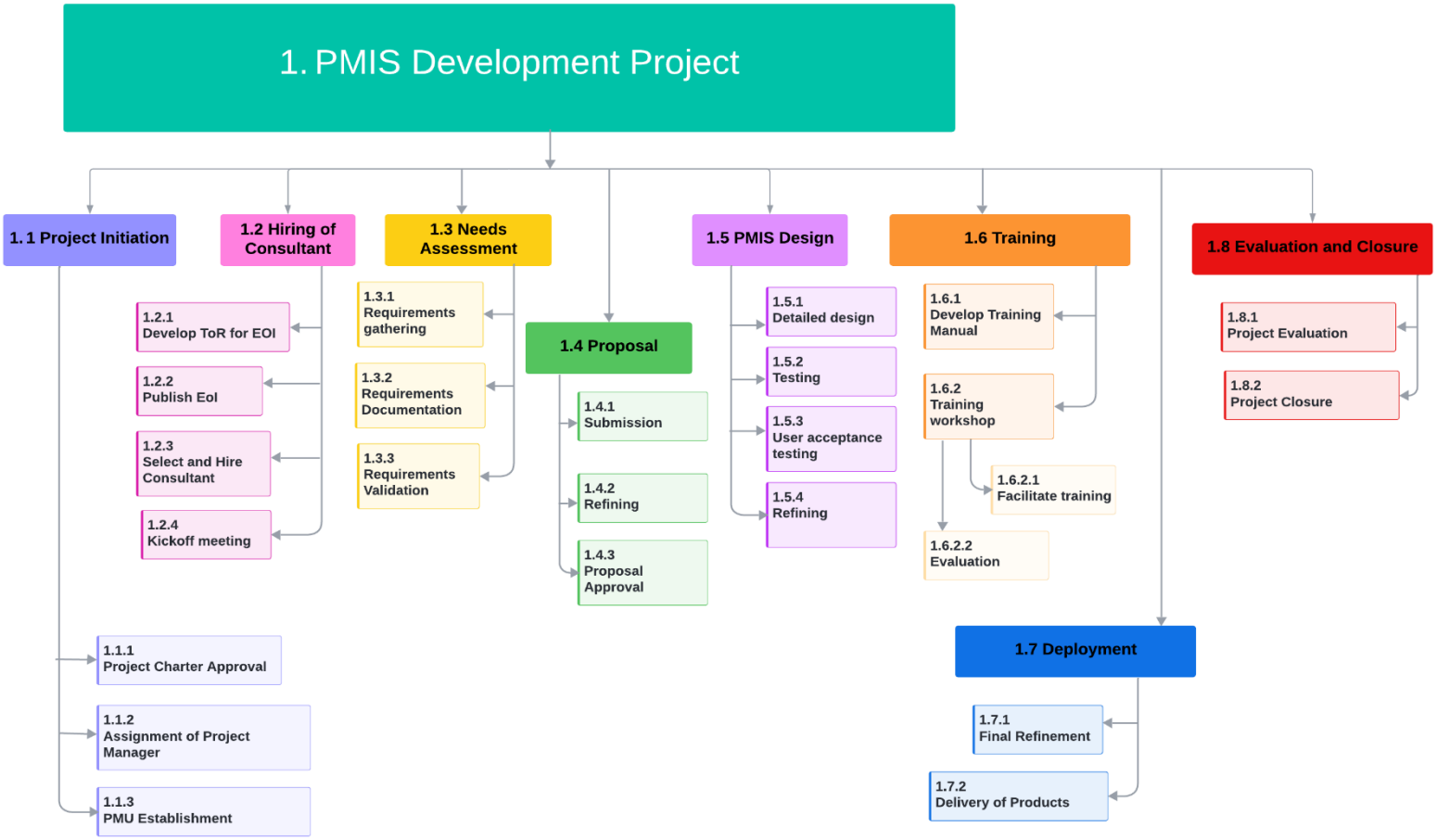
Note: Table outlining the different elements of the scope and presented in the form of a scope statement, Created by the Author.

4.2.4 Work-breakdown structure (WBS)

The WBS uses the decomposition technique to subdivide the project deliverables and all the work required in the project´s scope into smaller components and more manageable tasks that allow the project team to achieve the objectives and attain the deliverables (PMI, 2017). The WBS differs from the scope statement in that it is an elaboration of the description of the scope described in the scope statement by further defining and organizing the total scope of the project hierarchically (PMI, 2019). The project´s scope statement and expert judgement are inputs that can be used to generate the WBS for the PMIS project.

Figure 6.

Work breakdown structure



Note: A diagrammatic representation of the work breakdown structure for the PMIS project, Created by the Author.

4.2.5 WBS dictionary

To ensure all the components of the WBS are understood, a supporting document, the WBS dictionary can be developed. The WBS dictionary provides detailed information about deliverables, and activities, and also includes the person responsible for each component in the WBS.

Table 9.

WBS dictionary

Level	WBS Code	WBS Name	Description/Definition	Budgets	Responsible Organization
0	1	PMIS Development Project	Development of a PMIS for the Department of PSIP.		
1	1.1	Project Initiation	The initial phase where the project's goal, objectives, scope, deliverables, and stakeholders are identified.	-	
2	1.1.1	Project charter approval	The project sponsor reviews and signs the project charter to officially commence the project.	-	Project Sponsor, Department of PSIP
2	1.1.2	Assignment of Project Manager		-	
2	1.1.3	PSC establishment	The Project management unit, comprised of staff and stakeholders who will oversee the project is established.	-	Department of PSIP, Project Manager
1	1.2	Hiring of consultant			
2	1.2.1	Develop ToR for EOI	The terms of reference for the consulting firm that develops the PMIS is created.	-	Project Manager
2	1.2.2	Publish EOI		$100	Department of PSIP

Level	WBS Code	WBS Name	Description/Definition	Budgets	Responsible Organization
2	1.2.3	Select and hire consultant	EOIs are evaluated, and the most suitable consultant is hired. The consultant signs the contract.	-	PSC, Project Manager
2	1.2.4	Kickoff meeting	The consultants meet with the PSC and other key stakeholders. An overview of the work, and communication channels are established, and then the work commences.	$1000	Project Manager, PSC
1	1.3	Needs assessment	A study is conducted to determine the specific needs of the Department of PSIP.		
2	1.3.1	Requirements Gathering	Detailed requirements are collected from stakeholders using interviews and surveys.	-	Consulting firm
2	1.3.2	Requirements Documentation	Documenting the gathered requirements in a clear and concise manner.	-	Consulting firm
2	1.3.3	Requirements Validation	Validating the requirements with stakeholders to ensure they adequately represent their needs.	$1000	Consulting firm, Project Manager
1	1.4	Proposal	Creating the architectural and detailed design for the system.		
2	1.4.1	Submission	Design and present proposal to the stakeholders.	-	Consulting firm, Project Manager
2	1.4.2	Refining	Refining the proposal based on feedback from the stakeholders.	-	Consulting firm

Level	WBS Code	WBS Name	Description/Definition	Budgets	Responsible Organization
2	1.4.3	Proposal approval	The proposal for the PMIS is approved.	-	Department of PSIP, PSC, Project Manager
1	1.5	PMIS Design	Designing the overall system.		
2	1.5.1	Detailed Design	Creating detailed design specifications for each component of the PMIS.	-	Consulting firm
2	1.5.2	Testing	Review the design specifications and test.	-	Consulting firm
2	1.5.3	User acceptance testing	Stakeholders see and test the functionality and performance of the platform.	$1000	Consulting firm
2	1.5.4	Refining design	Refining the design based on feedback from the stakeholders.	-	Consulting firm
1	1.6	Training			
2	1.6.1	Develop training manual	Conducting unit tests to ensure individual components function correctly.		Consulting firm
2	1.6.2	Training workshop	Organize a workshop for training participants.	-	Project Manager
3	1.6.2.1	Facilitate training	Conduct training with stakeholders.	$3000	Consulting firm

Level	WBS Code	WBS Name	Description/Definition	Budgets	Responsible Organization
3	1.6.2.2	Evaluation	Workshop participants provide feedback on the training and training manual developed.	-	Consulting firm, Project Manager
1	1.7	Deployment			
2	1.7.1	Final refinement	Refining the platform based on feedback from the workshop.	-	Consulting firm
2	1.7.2	Delivery of products	Delivery and approval of the training manual and final product of the PMIS.	$1000	Consulting firm, Project Manager, PSC
1	1.8	Evaluation and Closure	Evaluating the project's performance and formally closing the project.		
2	1.8.1	Project Evaluation	Assessing the project's outcomes against its objectives.	$1000	Department of PSIP, PSC, Project Manager
2	1.8.2	Project Closure	Completing all closure activities.	-	Department of PSIP, Project Manager

Note: Table that describes each work package developed for the PMIS project, Created by the Author.

4.2.6 Validate Scope

The scope validation process is a formal process by which each project deliverable is validated and accepted (PMI, 2017). During this process, the deliverables are reviewed by the main project stakeholders (the PSC, Project Manager, and Department of PSIP), and if the stakeholders are satisfied that the deliverables meet the requirements, there will be approval/acceptance.

The inputs for the validate scope process include the scope management plan and requirements traceability matrix while a tool that can be used to validate is inspection of the deliverables. In the case of deliverables such as the assessment report and training manual, inspection can take the form of a review of the documents, while in the case of physical products and software, inspection can take place in the form of a product review for the PMIS. The output of this process would be the accepted deliverables for the PMIS project.

4.2.7 Control Scope

Control Scope is the process by which the status of the project and product scope is monitored and changes to the scope baseline are managed throughout the project to ensure the scope baseline is maintained (PMI, 2017). During this control scope process, the Project Manager monitors the scope on a day-to-day basis, and in the event that changes are required, they will be documented and submitted to the PSC for review and approval. Changes to the scope will be communicated to the main stakeholders of the project which include the Department of PSIP.

4.2.8 Roles and Responsibilities

In the management of the project´s scope, the Project Manager plays a pivotal role and is supported by the PSC and team at the Department of PSIP. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 10.

Scope Management Roles and responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	- N/A
PSIP	Project Manager	● Verifies project scope and approves project scope management plan ● Supervises the change control process and reviews and approves change requests. ● Documents and communicates changes to scope when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the scope. ● Participates in the change control process by identifying the need

Organization	Role	Responsibility
		for changes in the scope and making recommendations
ICT department and other Ministries and Departments	Other stakeholders	• Participates in the execution, and monitoring and evaluation process

Note: Table describing the roles and responsibilities of the project stakeholders in scope management, compiled by the Author.

4.3 Schedule Management Plan

The Schedule Management Plan describes all the processes required to manage the completion of the project within the required timeframe (PMI, 2017). Bell (2022) describes the Schedule Management Plan as a critical component of any Project Management Plan as it provides guidance on how the project schedule will be developed, maintained, and controlled. The processes involved with project schedule management, according to PMI (2017) are:

1. Plan schedule management
2. Define activities
3. Sequence activities
4. Estimate activity duration
5. Develop schedule
6. Control schedule

4.3.1 Plan schedule management

During the plan schedule management process, the policies, and documents to plan, develop, manage, execute, and control the project schedule are established (PMI, 2017). Inputs for this process include the project charter and scope management plan while the main tool that can be utilized is meetings with stakeholders from the PSC and Department of PSIP to develop the schedule management plan. The output will be the schedule management plan.

4.3.2 Define activities

This is the process by which all the actions to be performed to achieve deliverables are identified and documented (PMI, 2017). To achieve this, the schedule management plan and in particular the WBS is a key input, while expert judgement obtained through research and knowledge of similar projects, and the decomposition of work packages from the WBS are key tools to be utilized. The Activities List and the Milestone List will be the main outputs to be produced by the define activities process. The milestone list is a simple listing of all the significant points in the project and the dates by which they are to be completed while the activity list includes the schedule of activities required for the completion of the deliverables of the project and a description of the activities so that the project team is clear on the work to be completed.

Table 11.

Milestone list

Milestones	**End Date**
Project Initiation	March 24th 2025
Contract signing for software development firm	May 30th 2025
Requirements Validation for PMIS	July 11th 2025
PMIS Proposal	August 8th 2025
Software prototype	October 17th 2025
Testing by end user	November 28th 2025
Training Manual	January 23rd 2026
Training Workshop	February 14th 2026
Final PMIS platform product	March 27th 2026
Project Closure	May 8th 2026

Note: Table showing the milestone list and the dates of delivery for each milestone of the PMIS project, Created by the Author.

Table 12.

Activity list

WBS	Work Packages	Activity ID	Activity	Description/Definition
1.1	Project Initiation			
		1.1.1	Project charter approval	The project sponsor reviews and signs the project charter to officially commence the project.
		1.1.2	Assignment of Project Manager	A Project Manager is assigned from the existing staff at PSIP.
		1.1.3	PSC establishment	The project steering committee is comprised of staff and stakeholders who will oversee that the project is established.
1.2	Hiring of consultant			
		1.2.1	Develop ToR for EOI	The terms of reference for the consulting firm to develop the PMIS have been created.
		1.2.2	Publish EOI	The EOI is disseminated via social media platforms, shared to partner websites and platforms, and is published in local newspapers.
		1.2.3	Select and hire consultant	EoIs are evaluated, and the most suitable consultant is hired. The consultant signs the contract.
		1.2.4	Kickoff meeting	The consultants meet with the PSC. The communication channels are established, and work commences.
1.3	Needs assessment			
		1.3.1	Requirements Gathering	Detailed requirements are collected from stakeholders using interviews and surveys.

WBS	Work Packages	Activity ID	Activity	Description/Definition
		1.3.2	Requirements Documentation	Documenting the gathered requirements in a clear and concise manner.
		1.3.3	Requirements Validation	Validating the requirements with stakeholders to ensure it adequately represents their needs.
1.4	Proposal			
		1.4.1	Submission	Design and present the proposal to the stakeholders.
		1.4.2	Refining	Refining the proposal based on feedback from the stakeholders
		1.4.3	Proposal approval	The proposal for the PMIS is approved.
1.5	PMIS Design			
		1.5.1	Detailed Design	Creating detailed design specifications for each component of the PMIS.
		1.5.2	Testing	Review the design specifications and test.
		1.5.3	User acceptance testing	Stakeholders see and test the functionality and performance of the platform.
		1.5.4	Refining design	Refining the design based on feedback from the stakeholders.
1.6	Training			
		1.6.1	Develop training manual	Conducting unit tests to ensure individual components function correctly.

WBS	Work Packages	Activity ID	Activity	Description/Definition
		1.6.2	Plan training workshop	Plan hosting of 3-day training workshop
		1.6.2.1	Facilitate training	Conduct training with stakeholders.
		1.6.2.2	Evaluation	Workshop participants provide feedback on the training and training manual developed.
1.7	Deployment			
		1.7.1	Final refinement	Refining the platform based on feedback from the workshop.
		1.7.2	Delivery of products	Delivery and approval of the training manual and final product of the PMIS.
1.8	Evaluation and Closure			Evaluating the project's performance and formally closing the project.
		1.8.1	Project Evaluation	Assessing the project's outcomes against its objectives.
		1.8.2	Project Closure	Completing all closure activities.

Note: Table outlining all of the activities of the PMIS project and the schedule for their implementation, Created by the Author.

4.3.3 Sequence Activities

Sequencing activities allows for the relationships among project activities to be identified and documented so that the logical sequence of the work to obtain the greatest level of efficiency is clear to the project team (PMI, 2017). The scope management plan and activity list can be used as inputs while a project management information system tool can be used to develop the project schedule as this method is among the easiest methods to generate a graphical representation of the project schedule.

An output of the schedule activities process is a project schedule network diagram which is a graphical representation of the logical relationships or dependencies among the scheduled activities for the project as seen in Figure 7 below.

Figure 7.

Project Schedule Network Diagram

Note. Project schedule network diagram showing the logical relationships between the activities for the PMIS project, Created by the Author.

4.3.4 Estimate activity durations

The amount of time required to complete each activity is estimated in the estimate activity duration process (PMI, 2017). In this process, the activity list and scope management plan serve as inputs, while key tools utilized to estimate the duration of activities for the project are expert judgement where the knowledge of stakeholders in the

Department of PSIP, and among the PSC is leveraged along with analogous estimating which utilizes historical data from similar activities or projects. The key output is an updated activity list where the estimated durations for each activity for the PMIS project would be included, and the start date and end date can be determined.

Table 13.

Activity list update

WBS	Work Packages	Activity ID	Activity	Duration (days)	Start Date	End Date
1.1	Project Initiation					
		1.1.1	Project charter approval	10	24/03/25	04/04/25
		1.1.2	Assignment of Project Manager	1	07/04/25	07/04/25
		1.1.3	PSC establishment	10	07/04/25	18/04/25
1.2	Hiring of consultant					
		1.2.1	Develop ToR for EOI	10	14/04/25	25/04/25
		1.2.2	Publish EOI	2	28/04/25	29/04/25
		1.2.3	Select and hire consultant	23	30/04/25	30/05/25
		1.2.4	Kickoff meeting	1	02/06/25	02/06/25
1.3	Needs assessment					

WBS	Work Packages	Activity ID	Activity	Duration (days)	Start Date	End Date
		1.3.1	Requirements Gathering	15	09/06/25	27/06/25
		1.3.2	Requirements Documentation	5	30/06/25	04/07/25
		1.3.3	Requirements Validation	1	11/07/25	11/07/25
1.4	Proposal					
		1.4.1	Submission	10	14/07/25	25/07/25
		1.4.2	Refining	5	28/07/25	01/08/25
		1.4.3	Proposal approval	5	04/08/25	08/08/25
1.5	PMIS Design					
		1.5.1	Detailed Design	50	11/08/25	17/10/25
		1.5.2	Testing	20	20/10/25	14/11/25
		1.5.3	User acceptance testing	10	17/10/25	28/11/25
		1.5.4	Refining design	15	01/12/25	19/12/25
1.6	Training					
		1.6.1	Develop training manual	15	05/01/26	23/01/26
		1.6.2	Plan training workshop	15	26/01/26	13/02/26
		1.6.2.1	Facilitate training	3	16/02/26	18/02/26
		1.6.2.2	Evaluation	1	18/02/26	18/02/26

WBS	Work Packages	Activity ID	Activity	Duration (days)	Start Date	End Date
1.7	Deployment					
		1.7.1	Final refinement	17	19/02/26	13/03/26
		1.7.2	Delivery of products	10	16/03/25	27/03/26
1.8	Evaluation and Closure					
		1.8.1	Project Evaluation	15	30/03/25	17/04/25
		1.8.2	Project Closure	15	20/04/25	08/05/25

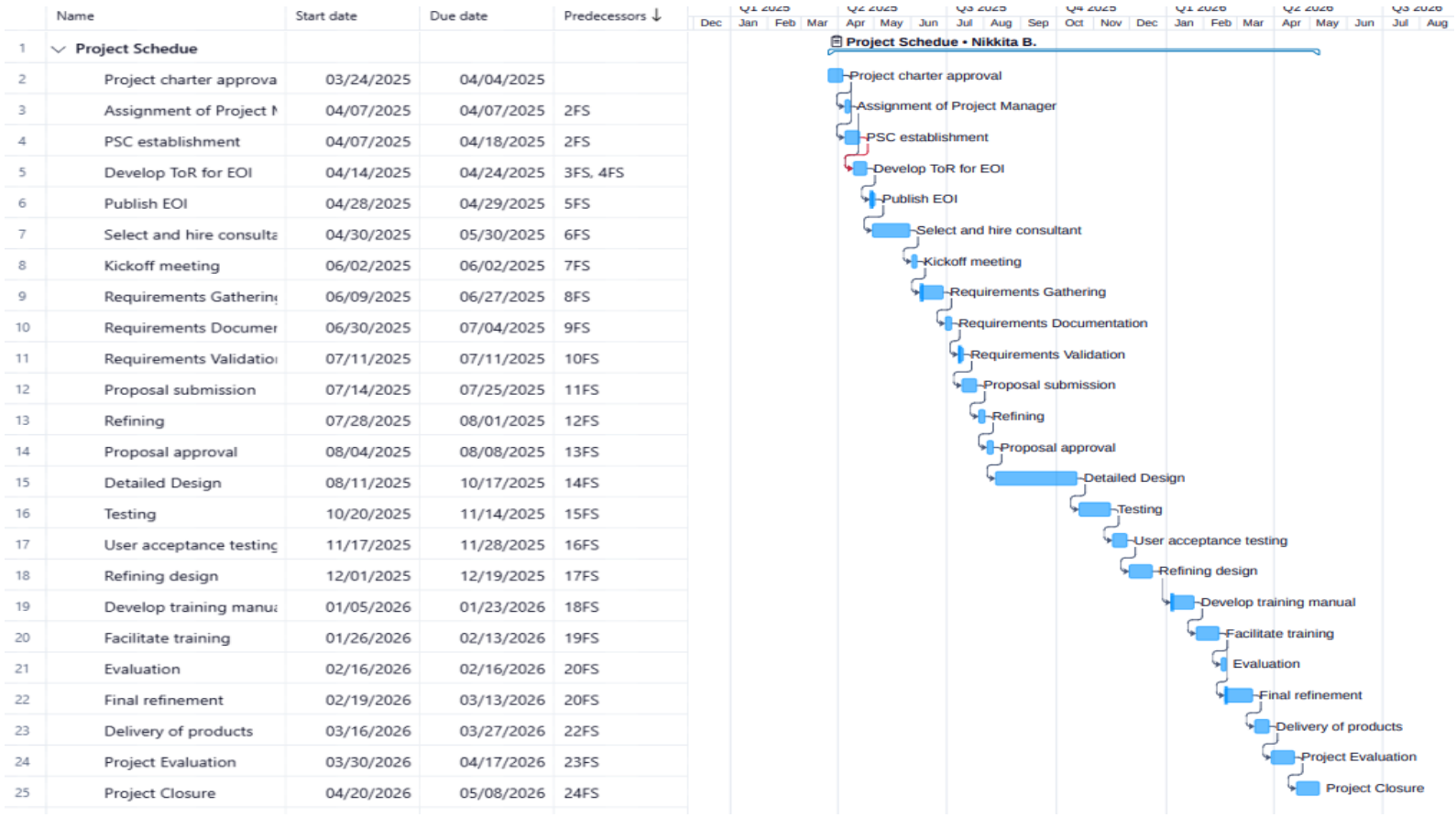
Note. Table showing the list of activities for the PMIS project and the duration, start date, and end date of each activity, Created by the Author.

4.3.5 Develop schedule

Among the most critical aspects of the schedule management plan is the develop schedule process as this is where the activities, their duration, and their corresponding sequence are used to develop the project schedule (PMI, 2017). In this case, a project management information system is used to create the model for the schedule using start and end dates 4orresponding with each activity previously identified during previous stages of the schedule management process. The Project schedule is presented in Figure 8 below.

Figure 8.

Project Schedule



	Name	Start date	Due date	Predecessors
1	**Project Schedue**			
2	Project charter approva	03/24/2025	04/04/2025	
3	Assignment of Project M	04/07/2025	04/07/2025	2FS
4	PSC establishment	04/07/2025	04/18/2025	2FS
5	Develop ToR for EOI	04/14/2025	04/24/2025	3FS, 4FS
6	Publish EOI	04/28/2025	04/29/2025	5FS
7	Select and hire consulta	04/30/2025	05/30/2025	6FS
8	Kickoff meeting	06/02/2025	06/02/2025	7FS
9	Requirements Gatherin	06/09/2025	06/27/2025	8FS
10	Requirements Documer	06/30/2025	07/04/2025	9FS
11	Requirements Validatio	07/11/2025	07/11/2025	10FS
12	Proposal submission	07/14/2025	07/25/2025	11FS
13	Refining	07/28/2025	08/01/2025	12FS
14	Proposal approval	08/04/2025	08/08/2025	13FS
15	Detailed Design	08/11/2025	10/17/2025	14FS
16	Testing	10/20/2025	11/14/2025	15FS
17	User acceptance testing	11/17/2025	11/28/2025	16FS
18	Refining design	12/01/2025	12/19/2025	17FS
19	Develop training manua	01/05/2026	01/23/2026	18FS
20	Facilitate training	01/26/2026	02/13/2026	19FS
21	Evaluation	02/16/2026	02/16/2026	20FS
22	Final refinement	02/19/2026	03/13/2026	20FS
23	Delivery of products	03/16/2026	03/27/2026	22FS
24	Project Evaluation	03/30/2026	04/17/2026	23FS
25	Project Closure	04/20/2026	05/08/2026	24FS

Note: Diagrammatic representation of the project schedule, inclusive of the activity duration and sequence of activities created by the Author.

4.3.6 Control schedule

The Control schedule process allows for the actual monitoring of the project schedule execution in comparison with the schedule baseline throughout the life of the project to ensure activities are being completed according to schedule (PMI, 2017). This allows for the project manager to make any necessary changes if there is any deviation from the schedule baseline. For this process, the schedule baseline is a key input as it forms the basis of the comparison, while a technique that can be used is Performance reviews.

For the PMIS project, performance review will allow for the comparison and analysis of the schedule performance vs the baseline, for example, using schedule variance and the schedule performance index described in Table 14, it can be determined if the project is delayed or on schedule. Additionally, Figure 10 provides an example of how the milestones for the PMIS project can be used in performance reviews.

Table 14.

Schedule performance indicators

Indicator		Description	Equation	Frequency	Responsible
Planned value	PV	The budgeted cost of the work that should be completed at a specific period in the project based on the project schedule.		Project start	Project Office
Earned value	EV	The cost of the work actually completed at a specific period in the project.		Monthly	Project Manager
Schedule variance	SV	This is a measure of whether the project is ahead or behind schedule for completion at a given point in time. If SV is greater than 0, then the project is	SV= EV-PV	Monthly	Project Manager

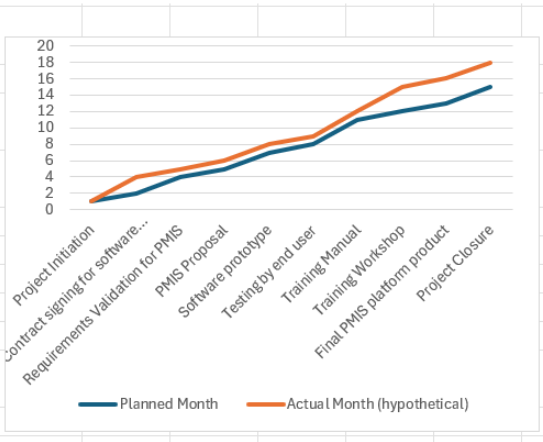
		ahead of schedule, but if it is less than zero, the project is behind schedule.			
Schedule performance Index	SPI	This is a measure of schedule efficiency. A SPI value of less than 1.0 indicates the project is behind schedule, and a SPI greater than 1.0 indicates the project is ahead of schedule.	SPI= EV/PV	Monthly	Project Manager

Note: Table showing how performance indicators such as SV and SPI can be used to monitor through comparison, the implementation of the project schedule, Created by the Author.

Figure 9.

Performance Review Guide

Milestone	Planned Month	Actual Month (hypothetical)
Project Initiation	1	1
Contract signing for software development firm	2	4
Requirements Validation for PMIS	4	5
PMIS Proposal	5	6
Software prototype	7	8
Testing by end user	8	9
Training Manual	11	12
Training Workshop	12	15
Final PMIS platform product	13	16
Project Closure	15	18



Note: Chart showing how performance review of milestones can be used to monitor through comparison, the planned schedule vs the actual schedule, Created by the Author.

Using the first milestone, we can see that it should be completed in the first month, however if completed a month later, the curve will be different, indicating that the project is

not being executed in accordance with the original plan, and thus prompting that changes are required to get the project back on track.

4.3.7 Roles and Responsibilities

In the management of the project´s schedule, the Project Manager plays the most crucial role and is supported by the Project team at the Department of PSIP. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 15.

Schedule Management Roles and Responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	● Provide resources
PSIP	Project Manager	● Verifies project schedule and approves project schedule management plan ● Supervises the change control process and reviews and approves change requests. ● Documents and communicates changes to the schedule when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the schedule.

		• Participates in the change control process by identifying the need for changes in the schedule, and making recommendations
ICT department and other Ministries and Departments	Other stakeholders	• Participates in the execution, and monitoring and evaluation process

Note: Table describing the roles and responsibilities of the project stakeholders in schedule management, compiled by the Author.

4.4 Cost Management Plan

A Project Cost Management Plan includes all those processes to ensure that the cost of the resources required to complete the project activities are within the approved budget such as planning, estimating, budgeting, financing, funding, managing, and controlling (PMI, 2017). Like the scope management plan, the cost management plan is a critical component of any project, and both the cost and scope management plans are closely related as the work packages are key determinants of the cost. The cost management processes according to the Project Management Institute (2017) are:

- Plan Cost Management
- Estimate Costs
- Determine Budget
- Control Costs

4.4.1 Plan Cost Management

Plan Cost Management is the process by which the processes or methods to estimate, budget, manage, monitor, and control the project´s cost are defined early in the project planning process, thus guiding the efficiency and management of project cost throughout the project (PMI, 2017). For the PSIP platform, inputs for planning cost management include the project charter, which defines the pre-approved financial resources, and the risk management plan and schedule management plan which will both identify processes and controls that impact cost. Additionally, Organizational process assets such as financial control procedures for the Government of St. Kitts and Nevis, and budget-

related policies and procedures must be considered. The main tool to be utilized for this process is expert judgement, especially as some of the activities for the project are commonly executed activities by the Department of PSIP and the donor, so there is a wealth of knowledge about the funding required to complete the activities. The output of the plan cost management process is the cost management plan.

4.4.2 Estimate Cost

The estimate cost process as the name suggests, is the process by which the cost of resources required to complete the project is estimated. According to Schwartz (2023), direct costs, indirect costs, and any other type of cost related to the project must be taken into account to establish the budget required to meet the financial commitment that is needed for project success. A key input for the estimate cost process is the WBS which identifies all project tasks and activities and allows for analysis to determine the necessary resources, including human resources required for each activity. The other input required is the project schedule, as it determines the duration of time that resources will be required.

Expert judgement and analogous estimating are the key tools/techniques to be used to estimate the cost as historical data from other projects with related activities exist. Additionally, simple data analysis can be applied to determine the contingency, as Cooper (2002) indicates that a set percentage which can range from 15% to 25% for IT service projects can be added to the base estimate. In this case, a 20% contingency is included in the project cost estimate to account for unexpected costs. The output of the estimate cost process is the cost estimate which indicates the cost required for each activity of the project.

Table 16.

Cost Estimate

WBS	Work Packages	Activity ID	Activity	Description of cost	Quantity	Unit Cost	Total Cost
1.1	Project Initiation						
		1.1.1	Project charter approval	-	-	-	-
		1.1.2	Assignment of Project Manager	-	-	-	-
		1.1.3	PSC establishment	-	-	-	-
1.2	Hiring of consultant						
		1.2.1	Develop ToR for EOI	-	-	-	-
		1.2.2	Publish EOI	Publishing in the local newspaper	1	$100	$100
		1.2.3	Select and hire consultant	-	-	-	-
		1.2.4	Kickoff meeting	Venue	1	$200	$200

WBS	Work Packages	Activity ID	Activity	Description of cost	Quantity	Unit Cost	Total Cost
				Catering	20	$15	$300
				Consulting firm (researcher, M&E expert, and Software developer)	1	$1700	$1700
1.3	Needs assessment						
		1.3.1	Requirements Gathering	Researcher	15	$300	$4500
		1.3.2	Requirements Documentation	Researcher and M&E expert	5	$900	$4500
		1.3.3	Requirements Validation	Venue	1	$200	$200
				Catering	20	$15	$300
				Researcher and M&E expert	1	$900	$900
1.4	Proposal						

WBS	Work Packages	Activity ID	Activity	Description of cost	Quantity	Unit Cost	Total Cost
		1.4.1	Submission	Researcher and M&E expert	10	$900	$9000
		1.4.2	Refining	Researcher and M&E expert	5	$900	$4500
		1.4.3	Proposal approval	Researcher and M&E expert	5	$900	$4500
1.5	PMIS Design						
		1.5.1	Detailed Design	Software Developer	50	$800	$40000
		1.5.2	Testing	Software Developer	20	$800	$16000
		1.5.3	User acceptance testing	Software Developer and M&E expert	10	$1400	$14000
		1.5.4	Refining design	Software Developer	15	$8000	$12000
1.6	Training						
		1.6.1	Develop training manual	M&E expert	15	$600	$9000
		1.6.2	Plan training workshop		-	-	-
		1.6.2.1	Facilitate training	Venue	3	$200	$600

WBS	Work Packages	Activity ID	Activity	Description of cost	Quantity	Unit Cost	Total Cost
				Catering	3	$800	$2400
				Software developer	3	$800	$2400
				M&E expert	3	$600	$1800
		1.6.2.2	Evaluation		-	-	-
1.7	Deployment						
		1.7.1	Final refinement	Software developer	17	$800	$13600
		1.7.2	Delivery of products	M&E expert	10	$600	$6000
1.8	Evaluation and Closure						
		1.8.1	Project Evaluation		-	-	-
		1.8.2	Project Closure		-	-	-

Note: Table showing the estimated cost of each activity for the PMIS project, Created by the Author.

4.4.3 Determine Budget

It is in the determine budget process that cost estimates that are developed in the estimate cost process are aggregated by activity or work package to establish a cost baseline (PMI 2017). The main input for the budget is the cost estimate for the PMIS project, and the tool used is cost aggregation, which allows for the cost estimate to be aggregated by work packages. In addition to a standard contingency reserve, a management reserve of 5% is also added to account for unknown or unforeseen risks within the scope of the PMIS project. The main output for this process would be the budget, and for the PMIS project, we see in Table 17 that the total budget to complete the PMIS project, including reserves, is $187,110.00 USD.

Table 17.

Budget

WBS	Work Packages	Estimated Cost
1.1	Project Initiation	$0
1.2	Hiring of consultant	$2300
1.3	Needs assessment	$10400
1.4	Proposal	$18000
1.5	PMIS Design	$82000
1.6	Training	$16200
1.7	Deployment	$19600
1.8	Evaluation and Closure	$0
	Subtotal	$148500
	Contingency (20%)	$29700
	Cost Baseline	$178200
	Management Reserve (5%)	$8910
	Total Budget	$187110

Note: Table showing the total budget required for the PMIS project, Created by the Author.

4.4.4 Control Costs

Controlling costs is an important process in a project, as over-expenditure can jeopardize a project's ability to deliver all the activities, especially in cases where there is no possibility of receiving extra funding. As a result, expenditure and project schedules must be closely monitored by the Project Manager as well as the Project Office. Any changes in costs must be documented and shared with the Project Steering Committee so that if changes need to be made, the PSC can make an informed decision.

For the control cost process, the cost baseline is the main input, while the main techniques to be utilized for the control cost process is Data Analysis, and specifically Earned Value Analysis which is used to compare the cost baseline to the actual cost performance and is described in Table 18, and Trend analysis which allows for the project´s project performance to be monitored over time to determine if cost performance is improving or not.

Additionally, expenditure reports should also be analyzed to monitor projected costs vs actual costs. In this project, the cumulative planned cost after each month can be determined when expenditure reports are produced, and the planned cumulative costs can then be measured against the actual costs as seen in Figure 10 below, to determine if the project is over or under budget. If over budget, the results will prompt a management response via the change control process. The outputs of this process include information on the performance of the PMIS projects, and change requests to the cost baseline if the project is underperforming.

Table 18.

Earned Value Analysis indicators

Indicator		Description	Equation	Frequency	Responsible
Planned value	PV	The authorized budget for the project		Project start	Project Office
Earned value	EV	The budgeted value of the work performed by a certain date.		Monthly	Project Manager
Actual cost	AC	The real costs of the work to complete an activity.		Monthly	Project Manager
Budget at completion	BAC	This is the expected sum of all the approved costs estimated to complete the project by the planned project end date.		Project start	Project Office
Cost variance	CV	This is the difference between actual costs and value earned as a result of the project activities. If negative, the project is over budget.	CV=EV-AC	Monthly	Project Manager
Schedule variance	SV	This is a measure of whether the project is ahead or behind schedule for completion at a given point in time.	SV= EV-PV	Monthly	Project Manager
Cost performance index	CPI	This is a measure of the cost efficiency of budgeted resources. A CPI value of less than 1.0 indicates a cost overrun for work completed, and CPI value greater than 1.0 indicates a cost underrun of performance to date.	CPI= EV/AC	Monthly	Project Manager
Schedule performance Index	SPI	This is a measure of schedule efficiency. A SPI value of less than 1.0 indicates the project is behind schedule, and a SPI greater than 1.0 indicates the project is ahead of schedule.	SPI= EV/PV	Monthly	Project Manager

Note: Table describing the earned value analysis indicators that can be applied to the PMIS project in order to track project costs, Created by the Author.

Figure 10.

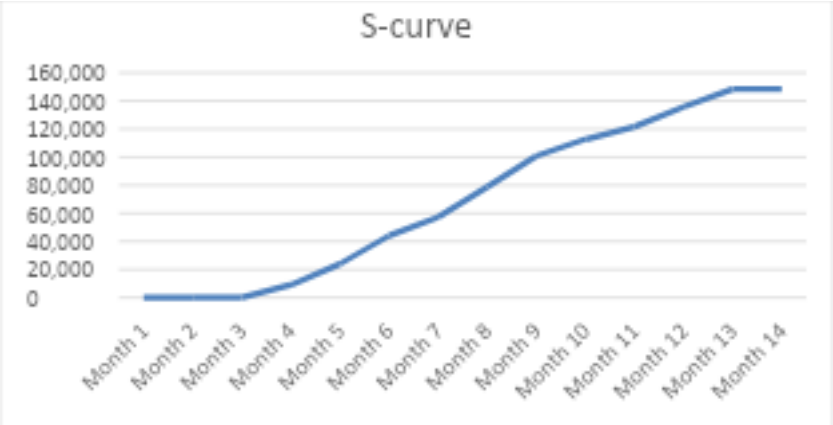
Cumulative costs

WBS	Work Packages	Total Cost	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
1.1	Project Initiation															
1.1.1	Project charter approval	-	$0	$0												
1.1.2	Assignment of Project Manager			$0												
		-														
1.1.3	PSC establishment			$0												
1.2	Hiring of consultant															
1.2.1	Develop ToR for EOI	-		$0												
1.2.2	Publish EOI	$100		$100												
1.2.3	Select and hire consultant	-			$0											
1.2.4	Kickoff meeting	$200				$2,200										
1.3	Needs assessment															
1.3.1	Requirements Gathering	$4500				$4,500										
1.3.2	Requirements Documentation	$4500				$2,250	$2,250									
1.3.3	Requirements Validation	1400					$1,400									
1.4	Proposal															
1.4.1	Submission	$9000					$9,000									
1.4.2	Refining	$4500					$2,250	$2,250								
1.4.3	Proposal approval	$4500						$4,500								
1.5	PMIS Design															
1.5.1	Detailed Design	$40000						$13,333	$13,333	$13,333						
1.5.2	Testing	$16000								$8,000	$8,000					
1.5.3	User acceptance testing	$14000									$14,000					
1.5.4	Refining design	$12000										$12,000				
1.6	Training															
1.6.1	Develop training manual	$9000											$9,000			
1.6.2	Plan training workshop	-											$0	$0		
1.6.2.1	Facilitate training	$7200												$7,200		
1.6.2.2	Evaluation	-												$0		
1.7	Deployment															
1.7.1	Final refinement	$13600												$6,800	$6,800	
1.7.2	Delivery of products	$6000													$6,000	
1.8	Evaluation and Closure															
1.8.1	Project Evaluation	-													$0	
1.8.2	Project Closure	-														$0
		PV total	$0	$100	$0	$8,950	$14,900	$20,083	$13,333	$21,333	$22,000	$12,000	$9,000	$14,000	$12,800	$0
		PV cumulative	$0	$100	$100	$9,050	$23,950	$44,033	$57,367	$78,700	$100,700	$112,700	$121,700	$135,700	$148,500	$148,500

Note: Diagram showing the cumulative planned costs for the duration of the PMIS project, Created by the Author.

Figure 11.

S-Curve of Cumulative Planned Cost



Note: Chart showing the s-curve, which is a graphical representation of the cumulative planned costs for the PMIS project over time, Created by the Author.

4.4.5 Roles and Responsibilities

In the management of the project's budget, the Project Manager plays the most crucial role and is supported by the Project team at the Department of PSIP. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 19.

Cost Management Roles and Responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	● Provide resources
PSIP	Project Manager	● Verifies the project budget and approves the project cost management plan ● Supervises the change control process and reviews and approves change requests. ● Documents and communicates changes to the budget when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the budget. ● Participates in the change control process by identifying the need for changes in the budget, and making recommendations
ICT department and other Ministries and Departments	Other stakeholders	● Participates in the execution, and monitoring and evaluation process

Note: Table describing the roles and responsibilities of the project stakeholders involved in cost management, compiled by the Author.

4.5 Quality Management Plan

Project Quality Management includes the processes for incorporating an organization's quality policy regarding the planning, managing, and controlling of the project quality requirements so that the stakeholders' objectives or expectations as it relates to the project deliverables are met (PMI, 2017). During the development of the PMIS for the Department of Public Sector Investment Planning, the execution of the quality management plan will ensure that there is continuous improvement in the implementation of the activities being undertaken by the consulting firm that is developing the PMIS. According to the Project Management Institute (2017), the Project Quality Management processes are:

1. Plan quality management
2. Manage quality
3. Control quality

4.5.1 Plan quality management

In the plan quality management process, the quality requirements and/or standards for the project and its deliverables are identified, and the process by which the project will demonstrate that it complies with the identified quality requirements and/or standards is documented for verification purposes (PMI, 2017). The inputs to the plan quality management process include project documents such as the project charter and requirements traceability matrix, project management plans such as the scope, stakeholder, risk, and cost management plan, and any relevant government policies and procedures.

Tools and techniques that can be utilized include interviews, expert judgement, and multicriteria decision analysis, specifically a quality prioritization matrix through which one can identify key issues to be addressed and prioritize quality metrics. The outputs of the plan quality management process will be the quality metrics, which describe the attributes of the PMIS platform and how the Control Quality process will verify compliance with the identified attributes.

Table 20.

Quality prioritization matrix

Quality Prioritization	Data Integrity	Integrability	Security	Usability	Reporting Capabilities	Row Total	Relative Decimal Value
Data Integrity		5	5	1/5	1	11.2	0.26
Integrability	1/5		1	1/5	1/5	1.6	0.04
Security	1/5	1		1/5	1/5	1.6	0.04
Usability	5	5	5		1	16	0.38
Reporting Capabilities	1	5	5	1		12	0.28
					Grand Total	**42.4**	

Note: Table showing the results of the quality prioritization process for the PMIS project using 5 relevant requirements, Created by the Author.

The quality prioritization table above presents an evaluation of five key quality requirements for the proposed PMIS: Data Integrity, Integrability, Security, Usability, and Reporting Capabilities. Usability ranks the highest with a Row Total of 16 and a Relative Decimal Value of 0.38, indicating that the ability for stakeholders to use and interact with the platform is most critical, and the quality management processes should ensure that this

is delivered to fulfill user acceptance requirements. Other critical aspects include reporting capabilities and data integrity, thus, user acceptance is built on the platform being able to deliver these attributes. Security and Integrability ranked among the least critical, hence, these are not considered among the priorities for quality standards of the design.

Using the prioritized attributes, the planned evaluation during the training can be used to generate customer satisfaction scores, which verifies this aspect of the quality metric. In addition to quality management of the PMIS platform, quality management is required for the overall project. In this case, the quality metric cost performance, which is measured using the CPI and SPI (see Table 21) can be utilized. These matrices verify that the project was completed within budget and on time.

Table 21.

Quality metrics

Objective	Metric	Means of Verification	Results/Outcomes	Responsible
The end users of the PMIS consider it to be user-friendly	Customer satisfaction scores (training evaluation survey)	User-friendliness has an 80% or more approval rating (on a scale of 1-5)	The end users of the PMIS will find that the PMIS is easy to understand and use.	Consulting firm
The PMIS is capable of satisfying the reporting requirements of the Department of PSIP.	Customer satisfaction scores (training evaluation survey)	Reporting capabilities 80% or more approval rating (on a scale of 1-5)	The PMIS will be able to generate the appropriate reports that meet the requirements of the Department of PSIP.	Consulting firm
The PMIS accurately captures and reflects project data across all aspects, including but not limited to timelines, budgets, resource allocation, and activity status.	Customer satisfaction scores (training evaluation survey)	Data integrity 80% or more approval rating (on a scale of 1-5)	The PMIS has a dashboard that displays key project information as well as performance indicators for each capital project.	Consulting firm
The PMIS project is completed within the approved project timeline	SPI	SPI is 1 or greater than 1	The project is completed in 14 months.	Project Manager
The PMIS project is completed within the project budget	CPI	CPI is 1 or greater than 1	Expenditure does not exceed US $187,110.00.	Project Manager

Note: Table describing the quality objectives, the applicable quality metric and the means of verification to determine if the objectives related to the platform have been met, Created by the Author.

4.5.2 Manage Quality

In the manage quality process, quality activities to be executed are defined in the quality management plan so that stakeholders can clearly identify if the quality objectives are met, and can address those ineffective processes that negatively impact the project´s quality (PMI, 2017). For this process, the quality metrics are a key input as they can serve as a benchmark for the deliverables and can be used to identify ways they can be improved. The project requirements also allow for the identification of ways project quality can be improved.

Techniques such as data analysis and in particular, document analysis of project reports and deliverables such as the PMIS platform proposal and PMIS training manual are useful in determining if stakeholders' expectations are being met. Similar to the analysis of documents would be inspections of the PMIS platform which can be a part of the validation process to ensure that the platform meets the requirements. The output for the process can be a matrix of all the quality activities, as seen in Table 22 below, as well as evaluation reports.

Table 22.

Quality activities matrix

Deliverable	Requirements Description	Manage and control activities	Frequency	Responsible
Assessment report	The project should identify and document specific needs of the Department of Public Sector Investment Planning to monitor and track capital project implementation	Review responses from the data gathering and conduct a Document Analysis of the assessment report	Once, prior to the validation of the assessment report	Project manager
PMIS proposal	The project stakeholders should validate the findings of the needs assessment before a PMIS proposal is developed	Confirm and document the agreement of stakeholders at the validation meeting	Once, during the validation of the assessment results workshop	Project manager
	The project should develop a proposal that describes the proposed PMIS to be developed, taking into account the data collected during the needs assessment	Document Analysis of the PMIS Proposal to confirm alignment with the needs assessment and validation	Once, before acceptance of the PMIS proposal	Project manager
PMIS platform	The Project Management Information System which stores data and information on all past, present, and upcoming capital projects; allows project data or information to be	Inspection and testing of the PMIS platform and provision of feedback if any	Several times, during design testing, and at the validation and user acceptance phase	IT Department, Project Manager, and Project Office

Deliverable	Requirements Description	Manage and control activities	Frequency	Responsible
	organized or grouped based on different criteria; facilitates effective monitoring and tracking of the performance of the capital projects and progress towards achieving development indicators using user-friendly dashboards; facilitates easy data analysis; and generates comprehensive reports			
PMIS platform	The Project Management Information System should be compatible with the existing infrastructure of the government	Inspection and testing of the PMIS platform and provision of feedback if any	Several times, during design testing, and at the validation and user acceptance phase	IT Department
	The Project Management Information System should comply with the government's security policies	Inspection and testing of the PMIS platform and provision of feedback if any	Several times, during design testing, and at the validation and user acceptance phase	IT department
Detailed user-friendly training manual	The project should develop a guiding document that will be used to train staff to use the PMIS	Document analysis of the training guide	Once, prior to the approval of the training guide	Project Manager

Deliverable	Requirements Description	Manage and control activities	Frequency	Responsible
Training report	The project should deliver comprehensive training that builds the capacity of all staff involved in capital project monitoring and reporting	Observation at training, and assessment of the training (evaluation)	Once, during the training workshop	Project Manager
Project Closeout Report	The project duration should not exceed 14 months	Review of project reports, and regular updates from the consultant	Monthly	Project Manager
	The project must be completed within the budget of US $187,110.00	Review of project expenditure reports	Monthly	Project Manager and Project Office
-	The project´s Steering Committee must review and approve all project deliverables in order for a deliverable to be considered complete	Review of project reports and meeting minutes	Several times, after the completion of each deliverable	Project Manager
-	The project team must comprise of staff from the Department of PSIP.	Review of project resources	Once, at the start of the project	Project Office
-	The Department of IT must provide technical support to the process for the design of the platform	Review of project reports and meeting minutes	Throughout the project	Project Manager

Deliverable	Requirements Description	Manage and control activities	Frequency	Responsible
-	Physical resources for the project must be provided by the government as co-financing.	Review of project resources	As needed.	Project Manager

Note: Table showing possible quality activities based on the requirements for the PMIS project and the ways in which quality can be managed by the responsible person, Created by the Author.

4.5.3 Control Quality

Control quality can be described as the process by which the results of executing quality management activities are monitored and recorded, allowing the project´s team to assess the performance of the project (PMI, 2017), and ensure the end product which in the case is PMIS meets the needs of the Department of PSIP. Inputs for this process include the quality metrics, work performance data, and the deliverables.

Important tools and techniques for this process would be evaluation surveys at workshops, and inspections/testing of the PMIS platform. Surveys developed by the consultants in coordination with the project team may be used to gather feedback from training participants and determine the level of satisfaction as it relates to the adherence of the PMIS platform as well as the training guide to the objectives/requirements identified in Table 7.

Some of the outputs for this process may include the verified deliverables, and documentation of the results of the quality activities identified in Table 22. It is also important to note that for any project, continuous improvement is critical as it allows for improvements to be made in the quality of the project based on the findings and recommendations produced as a result of the quality control processes (PMI, 2017). The plan-do-check-act or PDCA describes the processes that can be applied for continuous improvement.

Table 23

PDCA cycle

Process	Description
Plan	Identify needs and establish necessary objectives
Do	Execute the plan and test for possible solutions
Check	Analyze results in comparison with expected results
Act	Implement the best solutions and take actions to continually improve performance

Note: Table describing the processes of the plan-do-check-act cycle for continuous quality improvement, adapted from PECB, 2013.

4.5.4 Roles and responsibilities

In the management of the quality of the project, the Project Manager requires the support of all key stakeholders to ensure the project meets the quality objectives. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 24.

Quality Management Roles and Responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	● Provide resources if deliverables meet quality requirements
PSIP	Project Manager	● Verifies and approves the project quality management plan ● Supervises the change control process and reviews and approves change requests.

Organization	Role	Responsibility
		● Documents and communicates changes to the quality management plan when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the quality management plan. ● Participates in the change control process by identifying the need for changes in the quality management plan, and making recommendations
ICT department and other Ministries and Departments	Other stakeholders	● Participates in the execution, and monitoring and evaluation process

Note: Table describing the roles and responsibilities of the project stakeholders involved in quality management, compiled by the Author.

4.6 Resource Management Plan

According to PMI (2017), the resource management plan is part of the overall project management plan that outlines how resources for the project should be identified, acquired, and managed. Depending on the project's particular requirements, it can be separated into the team management plan, which describes the human resources, and the physical resource management plan. For the PMSI project, the resource management plan will guide the efficient use of all the project resources, including the people, equipment, and materials, in order to accomplish project goals while staying within the time constraints and budget. According to PMI (2017), the resource management plan processes are:

1. Plan resource management
2. Estimate activity resources
3. Acquire resources
4. Develop Team
5. Manage team
6. Control resources

4.6.1 Plan Resource Management

Plan Resource Management is the process by which the team and physical resources that are identified, acquired, and managed are first defined (PMI, 2017). For the PMIS project, inputs for the plan resource management process are the project charter and project documents such as the schedule and requirements documentation, which help to identify the resources needed and the time at which they are required. A key tool for the plan resource management process is the Responsibility Assignment Matrix (RAM). A RAM

simply outlines the project resources required for each work package (PMI, 2017). The type of RAM utilized to ensure that every work package has a clearly defined owner or responsible person is the RACI (responsible, accountable, consult, and inform) matrix in Table 25 below which describes the components of the RACI Matrix.

Table 25.

RACI Matrix description

Element of RACI	Description
R (responsible)	The person or people doing the work to complete the task.
A (accountable)	The person is ultimately answerable for the correct completion of the task. This is often a manager or decision-maker.
C (Consulted)	People who provide input before the task is completed (subject matter experts).
I (Informed)	People who need to be kept updated on progress but do not contribute directly.

Note: Table describing the different elements of the RACI Matrix, adopted from PMI (2017).

For the PMIS project, much of the responsibilities to complete tasks at the start of the project, prior to the processes to develop the platform, falls on the project manager and the project office. Once the consulting team is hired to develop the PMIS, they are answerable to the project manager and project office, as the responsibilities of executing tasks to gather the requirements, develop the platform, and then train staff to use the PMIS fall on them. The Department of Information Technology is a key partner and is often consulted as they have expertise in platforms and ICT tools, thus providing support, and the Ministry of Finance and the PSC are not involved in the day-to-day activities, but are

informed. The application of the RACI Matrix to the PMIS project is provided in Table 26 below.

Table 26.

RACI Matrix

WBS	Activity ID	Activity	R	A	C	I
1.1						
	1.1.1	Project charter approval	PO	MoF	DIT	OM
	1.1.2	Assignment of Project Manager	PO	PO	-	OM, DIT, MoF
	1.1.3	PSC establishment	PO	PM	-	MoF, OM, DIT
1.2						
	1.2.1	Develop ToR for EOI	PM	PO	DIT, PSC	OM
	1.2.2	Publish EOI	PM	PO	-	DIT, OM
	1.2.3	Select and hire consultant	PM, PO	PSC	DIT	OM, MoF
	1.2.4	Kickoff meeting	PM	PO	-	DIT, MoF, OM, PSC
1.3						
	1.3.1	Requirements Gathering	Con	PO, PM	DIT, OM, PSC	MoF
	1.3.2	Requirements Documentation	Con	PO, PM	-	-

WBS	Activity ID	Activity	R	A	C	I
	1.3.3	Requirements Validation	Con	PO, PM	DIT, OM, PSC	MoF
1.4						
	1.4.1	Submission	Con	PO, PM		-
	1.4.2	Refining	Con	PO, PM	DIT, OM	-
	1.4.3	Proposal approval	Con	PO, PM	DIT, PSC	MoF, OM
1.5						
	1.5.1	Detailed Design	Con	PO, PM	DIT	PSC, MoF, OM
	1.5.2	Testing	Con	PO, PM	DIT	PSC, MoF, OM
	1.5.3	User acceptance testing	Con	PO, PM	DIT, OM	PSC, MoF
	1.5.4	Refining design	Con	PO, PM	DIT	PSC, MoF, OM
1.6						
	1.6.1	Develop training manual	Con	PO, PM	-	DIT, PSC, MoF, OM
	1.6.2	Plan training workshop	Con	PO, PM	-	DIT, PSC, MoF, OM
	1.6.2.1	Facilitate training	Con	PO, PM	DIT, OM	PSC, MoF
	1.6.2.2	Evaluation	Con	PO, PM	DIT, OM	PSC, MoF
1.7						
	1.7.1	Final refinement	Con	PO, PM	DIT	PSC, MoF, OM
	1.7.2	Delivery of products	Con	PO, PM	DIT, PSC	MoF, OM
1.8						

WBS	Activity ID	Activity	R	A	C	I
	1.8.1	Project Evaluation	PM	PO	PSC, DIT, OM, MoF	-
	1.8.2	Project Closure	PM, PO	PSC	-	DIT, OM, MoF

Note: Table showing the results of the RACI Matrix for the PMIS project, Created by the Author.

Using the Responsibility assignment matrix technique allows for the main output of the plan resource management process to be developed which in this case would be the roles and responsibilities table which is outlined in Table 26 below.

Table 27.

Roles, Responsibilities, and Competencies

Role	Responsibilities	Skills/competence
Project Manager	- Coordinates all project activities, oversees the work of the consultants, and manages the project team. - Manages the schedule and budget - Facilitates communication among all project stakeholders and the consulting team. - Adheres to the reporting requirements of the project. - Ensures compliance with government policies - Manages project risks in coordination with stakeholders	Leadership Communication Financial Management Stakeholder Management Decision-Making Risk Management Project Management
Consulting Firm Researcher	- Engages with stakeholders to understand the needs of the PMIS - Coordinates the requirements gathering through surveys and interviews	Critical thinking Data analysis Problem-solving Communication

Role	Responsibilities	Skills/competence
	- Documents the requirements - Facilitates the communication of requirements between the project stakeholders and the Software Developer	Project management
M&E Expert and Consulting Team Leader	- Supervises the work of the consulting firm - Facilitates coordination between the government stakeholders and the consulting firm - Ensures project deliverables are aligned with the terms of the contract - Ensure adherence to quality requirements - Manages validation processes	Leadership Communication M&E principles Project Management Team Management Conflict resolution
Software Developer	- Ensures the PMIS system design aligns with requirements - Designs and develops the overall PMIS according to the required specifications - Collaborate with IT support stakeholders to address technical issues and challenges. - Refines the PMIS system based on user feedback - Perform quality checks	Problem solving Teamwork Communication Programming expertise Coding Data structures and algorithms
IT Support Team Manager	- Oversee IT support activities - Provides technical support to the project team - Ensures alignment with existing government ICT policies - Ensures there is compatibility with existing government infrastructure	Leadership Mentoring Problem solving Communication Programming expertise Coding Data structures and algorithms
PSC	- Ensures the project deliverables meet quality standards - Approve project deliverables	Project Management Leadership Financial Management
MoF	- Approves disbursements of payments	Financial Management

Role	Responsibilities	Skills/competence
Project Office PMIS - **Finance officer** - **Senior Project Analyst**	- Provides administrative and technical support to the project manager	Project Management Stakeholder Management Financial Management

Key PO – Project Office (Department of PSIP), DIT – Department of Information Technology, PSC- Project Steering Committee, MoF- Ministry of Finance, PM- Project Manager, Con – Consulting Firm

Note: Table showing the roles, responsibilities, and competencies of all the project staff and Departments that will be supporting the PMIS project, Created by the Author.

4.6.2 Estimate Activity Resources

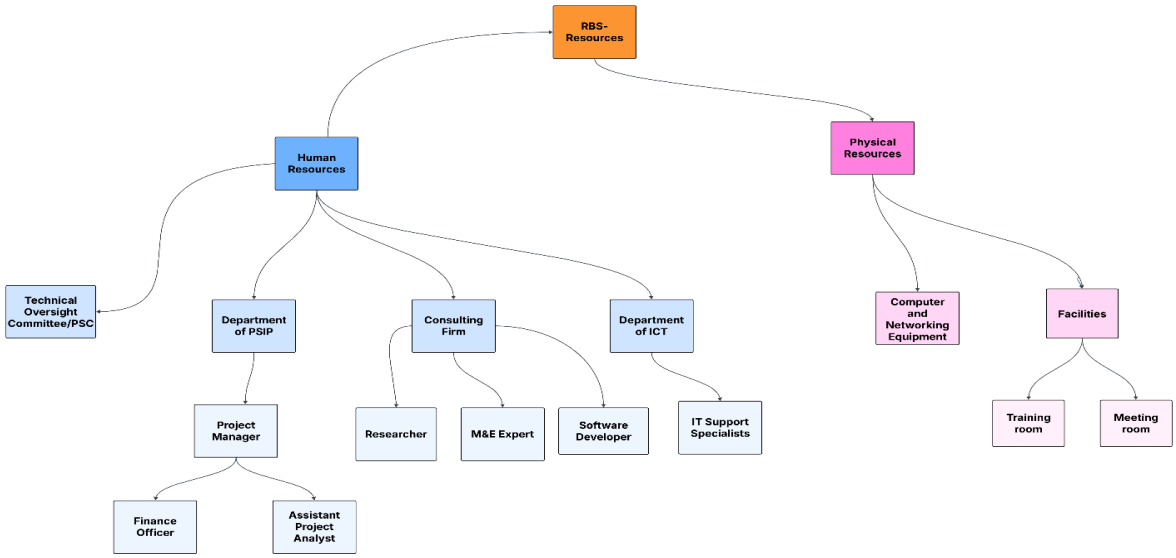
In the context of project resource management, estimating the type, amount or quantity of resources required to complete project activities efficiently, whether it be human or physical resources, is executed in the estimate activity resources process (PMI, 2017). Key inputs for this process include the project documents, notably the cost estimate and the activity list. The main technique that can be used to estimate the resources for this project is expert judgement where the Department of PSIP, with experience in designing and managing projects, can partner with the Department of Information Technology, which has expertise in software and platform development, to estimate the resources required.

The main output of this process is the Resource Breakdown Structure which is a hierarchical representation of project resources divided into two types, human and physical resources, to give a clear overview of all resources required for the project (PMI, 2017).

As seen in Figure 12 below, the project resources are categorized into two main groups, human resources and physical resources. Much of the human resources are from the Government of St. Kitts and Nevis, such as the PSC, Members of staff from the Department of PSIP, and the IT department, as they have oversight and provide support, while the external resource is the consulting firm. Similarly, the physical resources exist within the government of St. Kitts and Nevis, and include computer and networking equipment as well as facilities, all of which provide the necessary infrastructure for project meetings, training, and technical support.

Figure 12.

Resource breakdown structure



Note: The diagram shows the resource breakdown structure for the PMIS, which identifies all of the physical and human resources required for the completion of the project, Created by the Author.

4.6.3 Acquire Resources

Securing team members, facilities, tools, supplies, and other essential resources needed for project work is a key component of the acquire resources process (PMI, 2017). For this process, knowledge of organizational resources, especially the skills and competencies, as well as the procedure for assigning or allocating resources to the PMIS project is important as it allows the project office to determine how the resources will be acquired. Tools or techniques that can be utilized for the PMIS project are pre-assignment, and virtual teams. According to PMI (2017), resources are said to be pre-assigned when the team or physical resources are decided upon beforehand. For the PMIS project, the need for experience and the expertise of project management staff within the Department of PSIP is predetermined, along with the need for support staff from the IT department, as only the consulting firm would be hired.

Virtual Teams are defined as groups of individuals who work toward a common objective and perform their duties with little to no in-person meetings (PMI, 2017). This tool is necessary for the PMIS project as the project stakeholders are likely to operate from different locations within the Government of St. Kitts and Nevis. With the limited capacity in-country for a consulting firm to execute this project, firms in most cases are located in other geographic regions, thus further supporting the use of virtual teams as it will also reduce the cost of travel if the consultants can connect frequently with the other members of the team virtually.

The main outputs of the acquire resources process will be the Physical Resources Assignments and the Project Team Acquisition methods seen in Table 28 and Table 29 below.

Table 28.

Physical Resources Assignments

Physical Resource	Quantity	Responsible person
Computer and Networking Equipment	25	Project Manager
Meeting Room	1	Project Manager
Training Room	1	Project Manager

Note: Table identifying the quantity of physical resources required and the responsible person, Created by the Author.

The Physical resource assignment takes stock of the physical resources, including equipment and facilities needed for the project. These resources for the PMIS project will not be purchased but rather utilized from existing resources, for example, training will take place at the IT department's training room, which houses the computer equipment and face-to-face project meetings and discussions will take place at the PSIP conference room if needed.

Table 29.

Project Team Acquisition Methods

Resource	Resource acquisition method
Project Manager	The Project Manager is acquired internally and is the Project Officer within the Capital Projects Unit at the Department of PSIP, who is assigned by the Director.
Project team/Project Office	The project team supporting the project manager includes staff at the Department of PSIP. The support provided includes administrative support from the Finance Officer and an Assistant Project Analyst assigned by the Director of PSIP.
Consulting firm - Researcher - M&E expert - Software Developer	The consulting firm is hired through a formal, external procurement process requiring the submission of Expressions of Interest (EOI).
IT/Technical Support Specialists	Technical support is provided by two IT staff members at the Department of Information Technology and is assigned by the Director of Information Technology.
Technical Oversight/PSC	A Project Steering Committee made up of the 5 Directors that represent the Project Office, Department of IT, Public Works Department, Prime Minister's Office, and Ministry of Finance.

Note: Table describing how the human resources for the PMIS project will be acquired, Created by the Author.

The method for acquiring human resources is based on the government´s procedures for assigning or allocating staff to projects. In the case of the consulting firm, the process for acquiring services of an external consultant will be through the publishing of an Expression of Interest (EOI) or Request for Proposal (RFP).

4.6.4 Develop Team

Developing team members includes those methods for enhancing team members' abilities, and relationships, and creating an atmosphere that encourages excellence so that the group works efficiently to accomplish the project's goals (PMI, 2017). The roles, responsibilities and competencies listing, along with enterprise environmental factors such as human resource management policies regarding employee performance reviews and employee development and training, are key inputs to consider when developing the team as this knowledge allows for team leaders to better understand their team members and improve their capacities. The Tools and techniques for developing the team of the PMIS project are mainly Interpersonal and team skills which are described in Table 30 below.

Table 30.

Interpersonal and team skills

Interpersonal and team skills	Description
Conflict management	Timely and constructive resolution of conflicts which results in in greater productivity and positive working relationships
Influencing	Using skills such as persuasion, clear articulation of points, active listening, and giving consideration to others' perspectives in order to gain their trust and be able to

Interpersonal and team skills	Description
	address issues in a timely manner. reach agreements while maintaining mutual trust
Motivation	Empowering team members so they can participate in decision-making and have the ability to work effectively with little to no supervision.
Negotiation	Involving team members in decision-making and making decisions on the project based on a consensus
Team building	Improving interpersonal relationships by conducting activities that enhance the team's social interactions and build a working environment that is collaborative and cooperative.

Note: Table describing the relevant interpersonal and team skills for the successful completion of the PMIS project, adopted from PMI (2017).

Project documents such as the lessons learned can be updated as an output of the develop team process. This is important as other projects can learn from efforts to develop the team, resulting in improvements in the way staff from different departments work collaboratively to achieve a common goal.

4.6.5 Manage Team

A cooperative work atmosphere is promoted and productivity is maintained with the aid of effective team management, and as a result, monitoring team performance, settling disputes, giving constructive criticism, and making sure the group stays inspired and committed to the project's goals are a key part of the process to manage the project team (PMI, 2017). Human resource policies are a major input to the manage team process given that stakeholders are from different departments within the Government of St. Kitts and Nevis, and other inputs such as work performance reports and team assessment are not applicable when members of the team are being managed by different heads of department.

In addition to interpersonal and team skills such as influencing, motivation, conflict management, negotiation, and team building identified in Table 30 above, Leadership is among the most useful interpersonal skills for managing the team. Throughout the PMIS project, strong leadership by the Project Manager is crucial for directing, encouraging, and supporting the team so that in turn, they can perform well. Similarly, as the team lead, the M&E expert will have to demonstrate strong leadership skills among the group of consultants. The output of this process would be an update to the lessons learned register as techniques used to improve the team´s performance can be utilized for other projects to get similar results.

4.6.6 Control Resources

The Control Resources process involves those methods for ensuring that the project’s physical resources are available in accordance with the project´s schedule while

taking appropriate remedial action as needed (PMI, 2017). Inputs include project documents such as the RBS that identify the resources for the PMIS project, while the main technique for addressing discrepancies in actual resource utilization vs planned resource utilization is problem-solving, which outlines a set of actions that will enable the project manager to solve problems that are encountered during the control resource process. The steps are listed in Table 31 below.

Table 31.

Problem-solving steps

Step in problem solving	Description
Identify the problem	State what the problem is
Define the problem	Break the overall problem into smaller, and more manageable problems to be addressed.
Investigate	Collect the required data regarding the problem
Analyze	Using the data gathered, identify the cause of the problem.
Solve	From a number of available options to solve the problem, choose the most suitable solution.
Check the solution	Determine if the solution has resolved the problem.

Note: Table showing the steps involved in problem solving adapted from PMI (2017).

The output of the control resources process is updates to project documents including but not limited to the resource breakdown structure and physical resource assignments.

4.6.7 Roles and Responsibilities

In the management of the resources of the project, the Project Manager and the Project Office play the most critical role. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 32.

Resource Management Roles and Responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	● Provide resources for resource acquisition.
PSIP	Project Manager	● Verifies project resources and approves the project resource management plan. ● Supervises the change control process and reviews and approves change requests.

Organization	Role	Responsibility
		● Documents and communicates changes to the resource plan when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the resource plan. ● Participates in the change control process by identifying the need for changes in the resources, and making recommendations
ICT department and other Ministries and Departments	Other stakeholders	● Participates in the execution, and monitoring and evaluation process

Note: Table describing the roles and responsibilities of the project stakeholders involved in resource management, Compiled by the Author.

4.7 Communication Management Plan

According to Curry (2022), the objectives of information-sharing initiatives are described in a communication management plan, along with the steps that are intended to achieve those objectives, and as such, it can be said that the most effective and efficient methods for communicating with various stakeholders are outlined in the communication management plan. Key elements described and documented in a communication management plan include the communication items' structure, frequency of communications, audience, substance, means of communication, and expected results (Curry, 2022). The communication management plan processes, as described by PMI (2017), are:

1. Plan communications
2. Manage communications
3. Monitor communications

4.7.1 Plan Communications Management

The process of creating a suitable strategy and plan for project communications initiatives while taking into account the requirements of the project, the information requirements of each stakeholder is referred to as the plan communications management process (PMI, 2017). Plan Communication Management calls for tools and methods including communication technology and communications requirement analysis. For the PMIS project, inputs include but are not limited to the project charter which identifies direct and indirect stakeholders at the start of the project, as well as the resource

management plan that describes the roles and responsibilities of each stakeholder that will be involved in the project.

The main tools for the plan communication management process are Communication requirement analysis and communication technology. The communication requirement analysis allows for the determination and then definition of the information needs of the project stakeholders based on known stakeholder information, including their roles and responsibilities (PMI, 2017). The communication requirement matrix in Table 33 below describes the stakeholders' means of communication, frequency of communication, and the person responsible for the communication.

Table 33.

Communication requirement matrix

Stakeholder Group	Information Shared	Communication Methods	Frequency	Responsible Party
Project Sponsor/MoF	Budget updates, Decisions of the PSC	Reports, Emails	Quarterly	PSC Chairperson
Project Steering Committee	Project progress, decisions on approvals, budget updates	Meetings, Reports, Emails	Monthly / As Needed	Project Manager
Project Manager	Overall project updates, Project reports, and deliverables, risks	Meetings, Reports, Emails,	Weekly or as needed	Consulting firm

Stakeholder Group	Information Shared	Communication Methods	Frequency	Responsible Party
Project Office	Overall project updates, Project reports and deliverables, risks	Meetings, Reports, Emails,	Weekly or as needed	Project Manager
Consulting firm	Task assignments, stakeholder feedback	Meetings, Emails	Daily or As Needed	Project Manager
IT support specialists	Overall project updates, Project reports, and deliverables	Meetings, Emails	As Needed	Project Manager
Stakeholders from other Ministries	Project reports and deliverables	Emails	As Needed	Project Manager

Note: Table showing the communication requirements matrix which identifies the types of information to be shared with project stakeholders of the PMIS project, as well as the methods for sharing and the frequency by which the information should be shared, created by the Author.

From the communication requirement analysis in Table 33, it is evident that the project manager holds full responsibility for communicating with team members and is responsible for communication project updates and sending reports on a regular basis to the stakeholders of the government while day to day communication on the task level is communicated to the consulting firm and to some extent the team operating from within the

Department of PSIP. This communication is mostly communicated via email, while some updates require meetings. The main output of this process is the stakeholder communication requirements.

In the case of Communication technology, meetings and electronic documents are the main methods utilized for collaborating and sharing knowledge for this project.

4.7.2 Manage Communication

Manage Communications is the process by which project information is gathered, created, distributed, stored, retrieved, managed, monitored, and ultimately disposed of in a timely and suitable manner so that stakeholders and the project team can communicate effectively and efficiently (PMI, 2017). Key inputs for this process include the resource management plan that describes the communication required for managing project resources, the stakeholder management plan of team or physical resources, and the stakeholder engagement plan that outlines methods for engaging stakeholders with the use of appropriate strategies in mind. For the PMIS project, it is important that the following communication techniques described by PMI (2017) are utilized:

- Feedback- Information about responses to communication received, project deliverables, or a situation that occurred. This can be used to support positive interaction between the project manager and all other stakeholders.
- Nonverbal- Using appropriate body language and being conscious of such when communicating or expressing oneself.

- Presentations- The official distribution of data and/or documents such as progress reports, general project information, or information to support decision-making in an understandable and efficient manner.

In addition to communication techniques, project reporting is another important tool recommended for the PMIS project as disseminating project data, especially project updates, will be necessary for this project.

4.7.3 Monitor Communication

During the Monitor Communication process, the project team ensures that the stakeholders' information demands are satisfied. For this process, the resource management plan and stakeholder engagement plan are required as an input as they can be used to identify the project's stakeholders. The main technique that can be applied to this process is data representation, specifically the stakeholder engagement assessment matrix which can be used to determine the effectiveness of the communications activities. The stakeholder engagement assessment matrix is described in Chapter 4.10.2.

4.7.4 Roles and responsibilities

In the management of communication between stakeholders, the Project Manager plays the most critical role and is supported by the project office. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 34.

Communication Management Roles and Responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	- N/A
PSIP	Project Manager	● Verifies communication strategies and approves project communication management plan ● Supervises the change control process and reviews and approves change requests. ● Documents and communicates changes to the communication management plan when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the communication management plan. ● Participates in the change control process by identifying the need for changes in the communication management plan, and making recommendations

Organization	Role	Responsibility
ICT department and other Ministries and Departments	Other stakeholders	● Participates in the execution, and monitoring and evaluation process

Note: Table describing the roles and responsibilities of the project stakeholders involved in communication management, compiled by the Author.

4.8 Risk Management Plan

In project management, risks can be described as events or conditions that can affect the outcome of a project such that the project is either positively or negatively impacted. Risk management planning, risk identification, risk analysis, risk response planning, risk response implementation, and risk monitoring are often executed as a part of a Risk Management Plan in order to increase the likelihood of having positive risks or to decrease the likelihood of having negative risks (PMI, 2017). As such, the risk management plan processes identified by PMI (2017) are:

- Plan risk management
- Identify risks
- Prioritize risks
- Plan risk responses
- Implement risk responses
- Monitor risks

4.8.1 Plan Risk Management

The plan risk management process defines how risk management activities will be conducted, thus allowing for a balance between the risks and the benefits of the project (PMI, 2017). Since the project charter for the PMIS project outlines the assumptions, risks, and constraints, it is an input for the plan risk management process, while the stakeholder register can be utilized to determine the stakeholders' risk appetite and determine the roles and responsibilities for managing the risks of the project. The outputs of this process may

include the Risk Breakdown Structure (RBS) and the definitions of risk probability and impacts.

According to PMI (2017), the RBS can be described as a hierarchical representation of potential risks that allows project teams to then identify, assess, and prioritize risks. In Table 35. below, we can see that the major risks are technical risk which are related to the technical aspect of the project for example meeting the specifications or requirements of the platform and completing the project on time, management risks which are related to how the project is planned or executed, external risks which are beyond the control of the project management, and operational risks which are related to those risks that can occur in the day to day operations of the project (Sienkiewicz, 2022).

Table 35.

Risk breakdown structure

RBS Level 0	RBS Level 1	RBS Level 2	RBS Level 3
	1. Technical Risks	1.1 Scope	1.1.1 Unclear scope
			1.1.2 Scope creep
		1.2 Technology	1.2.1 Lack of compatibility with existing IT infrastructure
		1.3 Requirements	1.3.1 Unclear requirements
			1.3.2 Unrealistic requirements
			1.3.3 User dissatisfaction
	2 Management Risks	2.1 Communication	2.1.1 Limited communication
			2.2.2 Lack of transparency

RBS Level 0	RBS Level 1	RBS Level 2	RBS Level 3
Project risk			2.1.3 Inappropriate communication channels
		2.2 Project Management	2.2.1 Lack of experience
			2.2.2 Inadequate expertise
		2.3 Resources	2.3.1 Inadequate physical resources
	3 Operational Risks	3.1 Schedule	3.1.1 Schedule delays
		3.2 Financing	3.2.1 Cost overruns
			3.2.2 Withdrawal of funding
			3.2.3 Cost underestimation
			3.2.4 Delays in disbursements and payments
		3.3 Staffing	3.3.1 Competing priorities of government staff
			3.3.2 High staff turnover
	4 External Risks	4.3 Political	4.1.1 Government instability
		4.4 Environmental	4.2.1 Natural disasters
		4.5 Regulatory	4.3.1 Changes in laws
			4.3.2 Changes in compliance standards

Note: The table identifies possible risks at each level from the work package level to the activity level for the PMIS project, Created by the Author.

The definitions of risk probability and impact provide scales that can be used to determine the level of risk that can be tolerated by an organization and its key stakeholders and can be used to evaluate the threats as well as impacts (PMI, 2017). The scale is described in Table 36 below.

Table 36.

Definitions of risk probability

Risk Rating/ Scale	Probability	Impact on Project Objectives		
		Time	Cost	Scope
Very High	>70%	>10 months	> 10%	Severe and near irreversible impact on the PMIS completion
High	51 to 70%	8 to 9 months	5 to <10%	Major impact on the PMIS completion
Moderate	31 to 50%	4 to 7 months	2 to <5%	Moderate impact on the PMIS completion
Low	11 to 30%	1 to 3 months	1 to <2%	Minor impact on the PMIS completion
Very Low	1 to 10%	1 week to 4 weeks	<1 %	Insignificant impact on the PMIS Completion

Note: Table describing the risk levels and their potential implications on the PMIS project´s cost and schedule if risks occur, created by the Author.

4.8.2 Identify Risks

The process of identifying risks allows for the identification of individual project risks and sources of risk, so that the risks can be adequately documented, and the project team can adequately respond to risks (PMI, 2017). Numerous project documents such as the stakeholder register, requirements documentation, resource requirements, cost, and duration estimates are key inputs for the identification of risks for the PMIS project as they can all provide key information on the schedule, cost, stakeholders, and expectations of the stakeholders.

The main tools and techniques to be utilized include expert judgment for those stakeholders particularly at the Ministry of Technology who may be more familiar with risks in developing IT platforms as well as assumptions and constraints analysis (see Table 7) to determine what assumptions or constraints can potentially be a source of risk to the project. Additionally, a review of documentation may assist in identifying risks as unclear information or irregularities in project documents may indicate that there are risks associated with the project. The main output of this process is the risk register which provides details on each of the project risks.

Table 37.

Risk register

List of Identified Risks	Potential Causes	Potential consequences
1.1.1 Unclear scope	Limited consultation during the project design or ambiguity in the requirements	Delivery of unintended products
1.1.2 Scope creep	Uncontrolled changes in the scope without enough consideration given to the implications of an increase in the scope	Delays in project execution
1.2.1 Lack of compatibility with existing IT infrastructure	Lack of consideration given to existing infrastructure or outdated infrastructure	New equipment required or a PMIS that cannot be operationalized
1.3.1 Unclear requirements	Not enough responses gathered during the needs assessment	Delivery of unintended products
1.3.2 Unrealistic requirements	Too many requirements from too many stakeholders, or the lack of prioritization of the needs of departments.	Delays in project execution or difficulty hiring a consultant within budget.
1.3.3 User dissatisfaction	Unmet expectations possibly due to a poor design	No acceptance of deliverables
2.1.1 Limited communication	Poor relationships with stakeholders	Lack of buy-in by project stakeholders and difficulty executing the project
2.2.2 Lack of transparency	Lack of reporting and/or project updates	Lack of buy-in by project stakeholders and difficulty executing the project
2.1.3 Inappropriate communication channels	Lack of formal communication channels agreed upon and established	Miscommunication and misunderstandings which can result in a lack of buy-in by project stakeholders and difficulty executing the project
2.2.1 Lack of experience	Staff at PSIP have limited knowledge of managing projects, whether due to	Poor project management leading to delays in execution

List of Identified Risks	Potential Causes	Potential consequences
	being new or a lack of exposure	
2.2.2 Inadequate expertise	Lack of qualified staff in specialist areas in government, or consultants overestimating their capabilities.	Poor project management leading to delays in execution or inability of consultants to complete to assignment or meet the requirements
2.3.1 Inadequate physical resources	Poor maintenance of facilities and computer equipment	Increased cost as equipment may have to be purchased, or alternative and more expensive facilities may have to be used
3.1.1 Schedule delays	Delays in data collection, validation findings, and reports, challenges in the design phase or testing phase for the PMIS	The project will not be delivered on time.
3.2.1 Cost overruns	Unplanned costs or underestimated costs may result in the project exceeding the budget	More funding would have to be leveraged, or the scope may have to be reduced.
3.2.2 Withdrawal of funding	Unjustifiable expenses, poor communication with the Ministry of Finance or poor project management	The project will be discontinued, and the beneficiaries will not see an improvement in the monitoring of capital projects
3.2.3 Cost underestimation	Unexpected increases in the expected consultancy cost as well as cost for services required (e.g. catering and venue) to host workshops	More funding would have to be leveraged, or the scope may have to be reduced.
3.2.4 Delays in disbursements and payments	Slow approval of deliverables by the PSC and slow acceptance of this approval by the Ministry of Finance. Also, delays in communicating approval of deliverables.	Consultants may halt activities until payment is made
3.3.1 Competing priorities of government staff	Increased staff workloads for other assignments not related to the PMIS project	Slow feedback and support from staff resulting in project delays

List of Identified Risks	Potential Causes	Potential consequences
3.3.2 High staff turnover	Restructuring of key government departments, or government staff retiring, resigning, or being terminated	Lack of expertise may cause project delays of affect those mechanisms for quality control
4.1.1 Government instability	Social or political unrest in the country	Project delays and possible discontinuation if the situation is exacerbated
4.2.1 Natural disasters	Global increase in greenhouse gases may lead to increasing sea surface temperatures in the region, resulting in Hurricanes which increase the potential for flooding.	Project delays and possible discontinuation if the situation is exacerbated
4.3.1 Changes in laws	Recognized need for improvements and efforts made to improve them with little to no communication with the relevant stakeholders who support the project	Unexpected changes in the design to accommodate the changes in laws, thus delaying the completion of the project.
4.3.2 Changes in compliance standards	Recognized need for improvements and efforts made to improve them with little to no communication with the relevant stakeholders who support the project	Unexpected changes in the design to accommodate the changes in compliance standards, thus delaying the completion of the project.

Note: Table describing potential risks, their causes, and possible consequences for the PMIS project, Created by the Author.

4.8.3 Risk Prioritization

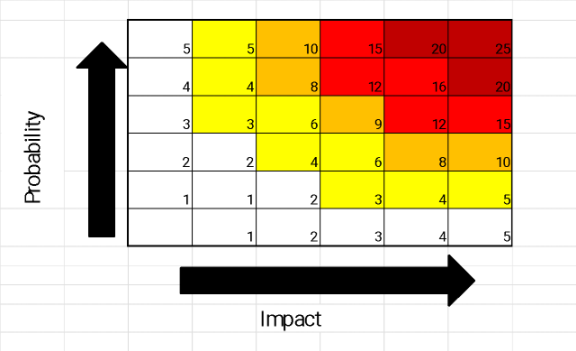
The process of prioritizing individual project risks can be performed using Qualitative Risk Analysis. This allows for the assessment of the likelihood of the risk

occurring, and the potential impact it may have if it occurs, thus allowing for risk mitigation measures to be focused on risks that are higher in priority (PMI, 2017). For the PMIS project, the main input is the risk register developed in the identify risks process. The tools and techniques that can be utilized for prioritizing risks are expert judgment as persons who are knowledgeable of other or similar projects can help to prioritize risks, and data analysis techniques such as Risk probability and impact assessment by which each risk is assessed individually to determine the likelihood that the risk will occur and the potential impact the risk will have on project objectives including but not limited to the impact on the schedule and cost (PMI, 2017).

Within the risk probability and impact matrix in Figure 13 below, the probability and impact of risks are given a rating on a scale from 1 to 5, with 1 representing very low risk, 2 representing low risk, 3 representing moderate risk, 4 representing high risk, and 5 representing very high risk. The overall risk level is determined by the intersection of the probability and impact ratings. When coupled with the definitions of risk probability and impacts in Table 36 above, we see that for the PMIS project, very high risks would have a severe and irreversible impact on the completion of the PMIS project while risks with a rating of very low would have small, insignificant impacts.

Figure 13.

Risk probability and impact matrix



Note: Diagram showing the risk levels based on the combination of probability and impact, Created by the Author.

Table 38.

Updated risk register

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating
1.1.1 Unclear scope	Limited consultation during the project design or ambiguity in the requirements	Delivery of unintended products	2	4	8	Moderate
1.1.2 Scope creep	Uncontrolled changes in the scope without enough consideration given to the implications of an increase in the scope	Delays in project execution	3	4	12	High
1.2.1 Lack of compatibility with existing IT infrastructure	Lack of consideration given to existing infrastructure or outdated infrastructure	New equipment required or a PMIS that cannot be operationalized	2	5	10	Moderate
1.3.1 Unclear requirements	Not enough responses gathered during the needs assessment	Delivery of unintended products	3	5	15	High
1.3.2 Unrealistic requirements	Too many requirements from too many stakeholders, or the	Delays in project execution or difficulty hiring a	2	5	10	Moderate

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating
	lack of prioritization of the needs of departments.	consultant within budget.				
1.3.3 User dissatisfaction	Unmet expectations possibly due to a poor design	No acceptance of deliverables	3	5	15	High
2.1.1 Limited communication	Poor relationships with stakeholders	Lack of buy-in by project stakeholders and difficulty executing the project	2	5	10	Moderate
2.2.2 Lack of transparency	Lack of reporting and/or project updates	Lack of buy-in by project stakeholders and difficulty executing the project	2	4	8	Moderate
2.1.3 Inappropriate Communication Channels	Lack of formal communication channels agreed upon and established	Miscommunication and misunderstandings which can result in a lack of buy-in by project stakeholders and difficulty executing the project	1	3	3	Low

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating
2.2.1 Lack of experience	Staff at PSIP have limited knowledge of managing projects whether due to being new or a lack of exposure	Poor project management leading to delays in execution	2	5	10	Moderate
2.2.2 Inadequate expertise	Lack of qualified staff in specialist areas in government, or consultants overestimating their capabilities.	Poor project management leading to delays in execution or the inability of consultants to complete the assignment or meet the requirements	2	5	10	Moderate
2.3.1 Inadequate physical resources	Poor maintenance of facilities and computer equipment	Increased cost as equipment may have to be purchased, or alternative and more expensive facilities may have to be used	3	4	12	High
3.1.1 Schedule delays	Delays in data collection, validation findings, and reports, challenges in the design	The project will not be delivered on time.	4	4	16	High

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating
	phase or testing phase for the PMIS					
3.2.1 Cost overruns	Unplanned costs or underestimated costs may result in the project exceeding the budget	More funding would have to be leveraged, or the scope may have to be reduced.	3	5	15	High
3.2.2 Withdrawal of funding	Unjustifiable expenses, poor communication with the Ministry of Finance or poor project management	The project will be discontinued, and the beneficiaries will not see an improvement in the monitoring of capital projects	1	5	5	Low
3.2.3 Cost underestimation	Unexpected increases in the expected consultancy cost as well as cost for services required (e.g. catering and venue) to host workshops	More funding would have to be leveraged, or the scope may have to be reduced.	2	5	10	Moderate
3.2.4 Delays in disbursements and payments	Slow approval of deliverables by the PSC and slow acceptance of this approval by the Ministry of Finance. Also, delays in	Consultants may halt activities until payment.	3	5	15	High

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating
	communicating approval of deliverables.					
3.3.1 Competing priorities of government staff	Increased staff workloads for other assignments not related to the PMIS project	Slow feedback and support from staff resulting in project delays	4	4	16	High
3.3.2 High staff turnover	Restructuring of key government departments, or government staff retiring, resigning, or being terminated	Lack of expertise may cause project delays or affect those mechanisms for quality control	2	4	8	Moderate
4.1.1 Government instability	Social or political unrest in the country	Project delays and possible discontinuation if the situation is exacerbated	1	4	4	Low
4.2.1 Natural disasters	Global increase in greenhouse gases may lead to increasing sea surface temperatures in the region, resulting in Hurricanes which increase the potential for flooding.	Project delays and possible discontinuation if the situation is exacerbated	3	4	12	High

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating
4.3.1 Changes in laws	Recognized need for improvements and efforts made to improve them with little to no communication with the relevant stakeholders who support the project	Unexpected changes in the design to accommodate the changes in laws, thus delaying the completion of the project.	1	3	3	Low
4.3.2 Changes in compliance standards	Recognized need for improvements and efforts made to improve them with little to no communication with the relevant stakeholders who support the project	Unexpected changes in the design to accommodate the changes in compliance standards, thus delaying the completion of the project.	1	3	3	Low

Note: Table showing the probability and impact of individual project risks as well as the risk levels for the PMIS project.

For the PMIS project, external risks are likely to cause any significant disruption to the project, while technical, operational, and management risks are likely to have a moderate to high impact on the project as seen in Table 38. Even further, technical and operational risks have the potential to cause the highest impacts on project completion as most of the individual risks are likely to have a moderate or high risk level.

The main output for the risk prioritization process is the register which would be updated with information from the assessments of probability and impacts for each project risk that is generated from the Perform qualitative risk analysis process.

4.8.4 Plan risk response

In the Plan Risk Response process strategies to address the project risks are developed for those risks that have higher priorities (e.g. moderate to very high risk levels) (PMI, 2017). The main input for the plan risk response process is the risk register, while strategies for individual threats can be utilized to determine risk responses. Table 39 describes general strategies for responding to threats posed by potential risks to any project.

Table 39.

Risk Responses

Response strategy	Description
Escalate	The threat is outside the scope of the project or beyond the project manager's authority to respond so the risks are managed at a higher level, e.g. program level or portfolio level.

Response strategy	Description
Avoid	Actions are taken by the project team to either eliminate the threat or protect the project from the impact of the threat
Transfer	Ownership of a threat is transferred to a third party who will bear the impact of the threat if it occurs, or manage the risk themselves
Mitigate	Action is taken early to reduce the likelihood of the occurrence of the threat or the impact of a threat if it occurs
Accept	Where the priority level is low or it is not possible to address the threat, the existence of a threat is acknowledged but no proactive action is taken

Note: Table describing risk response strategies, Adapted from PMI (2017).

The main output of the plan risk response would be a further updated risk register as the risk response planning process allows for the type of risk response strategy to be determined and included in the register.

Table 40.

Further updated risk register

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating	Potential Risk Response	Risk owner
1.1.1 Unclear scope	Limited consultation during the project design or ambiguity in the requirements	Delivery of unintended products	2	4	8	Moderate	Mitigate – Ensure there is a consultative process with all relevant project stakeholders during project design, and ensure the charter is validated and approved before project commencement	Project Office
1.1.2 Scope creep	Uncontrolled changes in the scope without enough consideration given to the implications of an increase in the scope	Delays in project execution	3	4	12	High	Mitigate – Ensure the project scope is clear and clearly communicated, implement a robust system for scope management, and	Project Manager

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating	Potential Risk Response	Risk owner
							prioritize requirements	
1.2.1 Lack of compatibility with existing IT infrastructure	Lack of consideration given to existing infrastructure or outdated infrastructure	New equipment required or a PMIS that cannot be operationalized	2	5	10	Moderate	Mitigate – Assess current IT infrastructure to ensure compatibility with the most basic requirements for a PMIS	IT Department
1.3.1 Unclear requirements	Not enough responses gathered during the needs assessment	Delivery of unintended products	3	5	15	High	Mitigate – Allow enough time for requirements gathering, and allow for validation of requirements before the design phase of the PMIS	Project Manager
1.3.2 Unrealistic requirements	Too many requirements from too many stakeholders, or the lack of prioritization of the needs of departments.	Delays in project execution or difficulty hiring a consultant within budget.	2	5	10	Moderate	Mitigation - Prioritize requirements	Project Manager
1.3.3 User dissatisfaction	Unmet expectations	No acceptance of deliverables	3	5	15	High	Mitigation – Facilitate regular	Project Manager

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating	Potential Risk Response	Risk owner
	possibly due to a poor design						communication and provide opportunities for validation and user testing.	
2.1.1 Limited communication	Poor relationships with stakeholders	Lack of buy-in by project stakeholders and difficulty executing the project	2	5	10	Moderate	Mitigate – Ensuring compliance with the project's stakeholder engagement plan and communication management plan	Project Manager
2.2.2 Lack of transparency	Lack of reporting and/or project updates	Lack of buy-in by project stakeholders and difficulty executing the project	2	4	8	Moderate	Avoid – Establishing reporting requirements that must be adhered to before the commencement of the project	Project Office
2.1.3 Inappropriate Communication Channels	Lack of formal communication channels agreed upon and established	Miscommunication and misunderstandings which can result in a lack of buy-in by project stakeholders and	1	3	3	Low	Avoid – Establishing agreed-upon communication channels at the start of the project	Project Manager

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating	Potential Risk Response	Risk owner
		difficulty executing the project						
2.2.1 Lack of experience	Staff at PSIP have limited knowledge of managing projects whether due to being new or a lack of exposure	Poor project management leading to delays in execution	2	5	10	Moderate	Mitigate – Train project staff in project management	Project Office
2.2.2 Inadequate expertise	Lack of qualified staff in specialist areas in government, or consultants overestimating their capabilities.	Poor project management leading to delays in execution or the inability of consultants to complete the assignment or meet the requirements	2	5	10	Moderate	Mitigate – Identify other human resources within the public service	Project Office and PSC
2.3.1 Inadequate physical resources	Poor maintenance of facilities and computer equipment	Increased cost as equipment may have to be purchased, or alternative and more expensive facilities may have to be used	3	4	12	High	Mitigate – Conduct an assessment of the facilities and computer equipment to ensure they meet the required	Project Manager and IT Department

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating	Potential Risk Response	Risk owner
							standard for the project.	
3.1.1 Schedule delays	Delays in data collection, validation findings, and reports, challenges in the design phase or testing phase for the PMIS	The project will not be delivered on time.	4	4	16	High	Mitigate – communicate deadlines, conduct regular project schedule progress monitoring including meetings, and ensure regular communication with project consultants	Project Manager
3.2.1 Cost overruns	Unplanned costs or underestimated costs may result in the project exceeding the budget	More funding would have to be leveraged, or the scope may have to be reduced.	3	5	15	High	Mitigate – Proper financial management can help to mitigate against cost overruns	Project manager
3.2.2 Withdrawal of funding	Unjustifiable expenses, poor communication with the Ministry of Finance or poor project management	The project will be discontinued, and the beneficiaries will not see an improvement in the monitoring on capital projects	1	5	5	Low	Escalate – When faced with the withdrawal of funding, this is not a matter that can be addressed by the project manager and has	PSC, Project Office

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating	Potential Risk Response	Risk owner
							to be escalated to the Department of PSIP and PSC.	
3.2.3 Cost underestimation	Unexpected increases in the expected consultancy cost as well as cost for services required (e.g. catering and venue) to host workshops	More funding would have to be leveraged, or the scope may have to be reduced.	2	5	10	Moderate	Escalate – If more funding is required as a result of cost underestimation which could only be significant if the consultant fees exceed what was budgeted for, this would not be a matter that can be addressed by the project manager and has to be escalated to the Department of PSIP and PSC.	PSC
3.2.4 Delays in disbursements and payments	Slow approval of deliverables by the PSC and slow acceptance of this approval by the Ministry of Finance. Also, delays in	Consultants may halt activities until payment.	3	5	15	High	Mitigate - Allow sufficient time to be allocated in the project for approval process	Project Office

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating	Potential Risk Response	Risk owner
	communicating approval of deliverables.							
3.3.1 Competing priorities of government staff	Increased staff workloads for other assignments not related to the PMIS project	Slow feedback and support from staff resulting in project delays	4	4	16	High	Mitigate – Allow sufficient time to be allocated in the project for providing feedback	Project Office
3.3.2 High staff turnover	Restructuring of key government departments, or government staff retiring, resigning, or being terminated	Lack of expertise may cause project delays or affect those mechanisms for quality control	2	4	8	Moderate	Mitigate – Identify other human resources within the public service to support quality control	Project Office and PSC
4.1.1 Government instability	Social or political unrest in the country	Project delays and possible discontinuation if the situation is exacerbated	1	4	4	Low	Accept – No action	Project Manager
4.2.1 Natural disasters	Global increase in greenhouse gases may lead to increasing sea surface temperatures in the region,	Project delays and possible discontinuation if the situation is exacerbated	3	4	12	High	Accept – No action	Project Manager

List of identified risks	Potential Causes	Potential consequences	Probability	Impact	PXL	Risk Level/Rating	Potential Risk Response	Risk owner
	resulting in Hurricanes which increase the potential for flooding.							
4.3.1 Changes in laws	Recognized need for improvements and efforts made to improve them with little to no communication with the relevant stakeholders who support the project	Unexpected changes in the design to accommodate the changes in laws, thus delaying the completion of the project.	1	3	3	Low	Mitigate – pay regular attention to laws and any planned changes	Project Manager
4.3.2 Changes in compliance standards	Recognized need for improvements and efforts made to improve them with little to no communication with the relevant stakeholders who support the project	Unexpected changes in the design to accommodate the changes in compliance standards, thus delaying the completion of the project.	1	3	3	Low	Mitigate – pay regular attention to standards and any planned changes	Project Manager

Note: Table describing potential risk responses that can be applied to the PMIS project, Created by the Author

4.8.5 Implement Risk Response

During the Implement risk response process, the agreed-upon risk responses are implemented to address the project´s overall project risk exposure and reduce the threats posed by individual project risks. Since the risk register usually outlines agreed-upon risk management strategies, it is considered a main input for this process, while expertise from relevant individuals or stakeholders would be a useful tool to determine the best method for effectively implementing the risk response strategies. After implementing risk responses, the risk register may need to be updated, thus serving as a key output of this process. Additionally, lessons will be learned through the implementation of risk response strategies, hence, updates to the lessons learned register would also be a key output of this process.

4.8.6 Monitor Risks

Monitor Risks is the process by which the implementation of the risk response strategies is monitored, and the effectiveness is evaluated to ensure information regarding risks stays current and updated to better inform decision making (PMI, 2017). This process also requires the risk register as a main input, while a key tool for this process can be data analysis, specifically Technical Performance Analysis. According to PMI (2017), technical performance analysis provides a comparison between the technical accomplishments during project execution and the original schedule for technical achievement so that deviations can be easily identified, and the impact of threats can be determined. Key outputs for this process would be updates to the lessons learned register as well as the risk register.

4.8.7 Roles and responsibilities

In the management of risks, the Project Manager and Project Office play the most critical role and are supported by the other project stakeholders. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 41.

Risk Management Roles and Responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	- N/A
PSIP	Project Manager	● Verifies project risks and response strategies, and approves the project risk management plan ● Supervises the change control process and reviews and approves change requests. ● Documents and communicates changes to the risk management plan when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the risk management plan.

Organization	Role	Responsibility
		● Participates in the change control process by identifying the need for changes in implementing risk responses, and making recommendations
ICT department and other Ministries and Departments	Other stakeholders	● Participates in the execution, and monitoring and evaluation process

Note: Table describing the roles and responsibilities of the project stakeholders involved in risk management, compiled by the Author.

4.9 Procurement Management Plan

Project Procurement Management encompasses the procedures required to buy or obtain products, services, or results needed from external sources, and often includes the required processes for the administration of agreements, including but not limited to contracts, purchase orders, and memoranda of agreements (MOAs) (PMI, 2017). The procurement management plan processes are:

- Plan procurement
- Conduct procurement
- Control procurement

4.9.1 Plan Procurement Management

Plan Procurement Management is the process by which procurement decisions regarding the approach to be taken to identify vendors are documented(PMI, 2017). The main inputs for this project would be the Resource Management Plan as it identifies the resources to be acquired, and organizational process assets such as Government Policies on procurement and the types of contracts that the government can be engaged in. In St. Kitts and Nevis, most government projects use fixed-price contracts by which the buyer and seller agree on a set price for the goods or services, regardless of any cost increases that may occur during execution (Mathewson, 2024).

One key technique that should be utilized for this project is Source Selection Analysis which establishes the criteria and methods for evaluating potential vendors by considering factors such as price, technical expertise, and past performance, thus ensuring

the best supplier is chosen (PMI, 2017). The source selection criteria would then be an output for the plan procurement process. Table 42 below outlines source selection criteria which is based on qualifications for procuring the services of a consulting firm to develop the PMIS as the price is fixed.

Table 42.

Selection criteria

#	**Description**	**Points**
	PROJECT PROPOSAL	
1	Methodology and Work Plan for the Consultancy Including the implementation schedule, timelines, and milestones for all activities.	10
	CONSULTING FIRM EXPERIENCE	
2a	A legally registered entity demonstrating a minimum of 5 years' experience in the design of platforms for project monitoring and evaluation.	10
2b	Demonstrate execution of two assignments similar in size and scope.	10
	Monitoring & Evaluation Expert/Team Leader	
3a	An advanced degree or higher in Monitoring and Evaluation, International Development, Project Management, Finance, and/or Business Administration.	10
3b	A minimum of (10) years of relevant experience at the national or international level in Projects/Program monitoring and implementation.	10
3c	A minimum of (5) years' experience leading teams for similar assignments.	10
	Researcher	
4a	Bachelor's degree in Social Science, or a closely related field.	10

4b	At least (5) years' professional working experience coordinating data collection and stakeholder engagement.	5
4c	Prior experience conducting or participating in needs assessments for project monitoring tools.	5
ICT Expert		
5a	A minimum of an advanced degree (Master's degree or equivalent) in Information Technology (IT), Computer Science, or a related field.	10
5b	Experience in the design and development of PMIS and online platforms for data collection, sharing, and information management. Solid understanding of the concepts of user experience, user interface design principles, and conceptual design.	10
	TOTAL	100

Note: Table showing criteria that focuses on qualifications in order to identify and select a service provider to develop the PMIS, Compiled by the Author.

In addition to the source selection criteria, bid documents can also be an output of the plan procurement management process. According to PMI (2017), bid documents are formal documents used to solicit proposals from potential vendors and outline project requirements, terms, and conditions to ensure a fair and competitive selection process. The most commonly used bid document in St. Kitts and Nevis is the Request for Proposal (RFP) which is issued to vendors requesting proposals on how they intend to execute a project.

4.9.2 Conduct Procurement

Conduct Procurement refers to the process of various tools and techniques used to solicit seller responses, select a vendor, and finalize the contract while ensuring that the procurement activities align with organizational objectives and project requirements (PMI, 2017). Numerous documents can serve as inputs for this process for example the bid documents and source selection criteria agreed upon during the plan procurement process, as well as the project schedule that outlines dates for procurement processes, and requirements documentation which can provide insight into the technical requirements the service provider must fulfil, and the proposals from the service provider.

Expert judgment is crucial for evaluating proposals and making well-informed selection decisions, and as such, IT professionals with technical expertise can be involved in reviewing vendor proposals based on predefined criteria, such as technical capabilities, compliance with IT standards, scalability, security protocols, and compatibility with the organization's IT infrastructure. This can be implemented in coordination with the technique Advertising. It is also a good technique to be used for the PMIS project as it would allow the bid notices to attract potential suppliers or vendors. The main output of this process would be the signed agreement or contract which according to PMI (2017), is a mutually binding agreement that outlines the service provider's obligations to provide the specified product(s) or service.

4.9.3 Control Procurement

Control Procurement is the process of overseeing procurement activities, tracking contract performance, implementing necessary adjustments, and ensuring both the buyer and seller fulfil their contractual commitments so that deliverables meet the specified requirements, quality standards, and project expectations (PMI, 2017). The agreement or contract would be a key input for this process, along with previously identified project documents used during the conduct procurement process.

During this process, the deliverables will undergo inspection to ensure the obligations of the service provider are fulfilled. For example, the Project Steering Committee, IT department, and Project Office will be involved in the review of deliverables, while stakeholders from other Ministries and the IT Department will have the chance to test the Project Management Information System (PMIS) to ensure its functionality and compliance with project objectives.

An output of the control procurement process could be Seller Performance Evaluation Documentation which according to (PMI, 2017), provides details of the supplier's performance based on contract terms. Project stakeholders would assess using an evaluation criteria similar to the one presented in Table 43 to provide an overall rating of the seller's performance, taking into account factors such as quality of work, timeliness, communication, and professionalism among others. If the evaluation is positive, the seller may be considered for future projects. However, if the performance is unsatisfactory, it will be recorded, and future procurement decisions may take past performance into account when reviewing bids from the same seller.

Table 43.

Evaluation Criteria

VENDOR / CONTRACTOR PERFORMANCE EVALUATION				
Vendor Name:		Date:		
DEFINITIONS OF PERFORMANCE RATINGS				
EXCEPTIONAL Exceeds contractual requirements. The actions taken by the vendor met the contractual requirements, and the scope of services was accomplished.	**SATISFACTORY** Meets contractual requirements. The actions taken by the vendor were Satisfactory.	**UNSATISFACTORY** Does not meet contractual requirements, and recovery is not likely in a timely manner. The vendor's corrective actions appear or were ineffective.	**N/A** Not Applicable	**INSUFFICIENT INFORMATION TO RATE** There is not sufficient information to rate performance.
PERFORMANCE RATING			**COMMENTS (Attach additional sheets if necessary)**	
Work performed in compliance with contract terms.	□ Exceptional □ Satisfactory □ Unsatisfactory □ N/A □ Insufficient info. to rate			
Timeliness of work	□ Exceptional □ Satisfactory □ Unsatisfactory □ N/A □ Insufficient info. to rate			
PERFORMANCE RATING			**COMMENTS (Attach additional sheets if necessary)**	
Professionalism	□ Exceptional □ Satisfactory □ Unsatisfactory □ N/A □ Insufficient info. to rate			

Quality of work	□ Exceptional □ Satisfactory □ Unsatisfactory □ N/A □ Insufficient info. to rate	
Communication and Accessibility	□ Exceptional □ Satisfactory □ Unsatisfactory □ N/A □ Insufficient info. to rate	
Prompt and effective correction of situations and conditions	□ Exceptional □ Satisfactory □ Unsatisfactory □ N/A □ Insufficient info. to rate	
Documentation records, receipts, invoices, and computer-generated reports are received in a timely manner and in compliance with contract specifications	□ Exceptional □ Satisfactory □ Unsatisfactory □ N/A □ Insufficient info. to rate	
Would you recommend using this firm again?	☐ ☐ **Yes** **NO**	(Explain)
OVERALL PERFORMANCE	□ Exceptional □ Satisfactory □ Unsatisfactory	

Note: Table showing a sample evaluation criteria that can be used to assess a service provider's work at the end of the contract or project, adapted from Prairie View A&M University (n.d.).

4.9.4 Roles and Responsibilities

In the management of procurements, the Project Manager and the Project Office play the most critical role and are supported by the Project Steering Committee and, to an

extent, the other stakeholders. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 44.

Procurement Management Roles and Responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	- N/A
PSIP	Project Manager	● Verifies and approves project procurement management plan ● Supervises the change control process and reviews and approves change requests. ● Documents and communicates changes to the procurement management plan when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the procurement management plan. ● Participates in the change control process by identifying the need for changes in the procurement of

Organization	Role	Responsibility
		goods and services, and making recommendations
ICT department and other Ministries and Departments	Other stakeholders	• Participates in the execution, monitoring and evaluation process

Note: Table describing the roles and responsibilities of the project stakeholders involved in procurement management, compiled by the Author.

4.10 Stakeholder Management Plan

Project Stakeholder Management encompasses the procedures needed to recognize individuals, groups, or organizations that may influence or be influenced by the project, to evaluate stakeholder expectations and how they can impact the project, and to formulate suitable strategies that facilitate the involvement of stakeholders in project decision-making and implementation (PMI, 2017). The stakeholder management plan processes are:

- Identify stakeholders
- Plan stakeholder engagement
- Manage stakeholder engagement
- Monitor stakeholder engagement

4.10.1 Identify Stakeholders

The Identify Stakeholders process involves the continuous recognition of individuals or groups connected to the project, assessing their interests, roles, relationships, level of influence, and potential impact on project outcomes, and then ensuring the project team can effectively determine how to engage each stakeholder or stakeholder group appropriately (PMI, 2017). A key input for this process is the communications management plan, they are generally closely related and closely linked to the stakeholder engagement plan. To identify stakeholders, data representation is a useful technique that helps categorize and prioritize stakeholders based on their influence and interest in the project. For the PMIS project, the Power/Interest Grid is recommended as it classifies stakeholders based on their level of power (authority) and interest in the project as seen in Figure 14.

The primary outcome of the Identify Stakeholders process is the stakeholder register which can provide information about stakeholders such as their responsibilities, expectations, requirements, and level of power/interest (PMI, 2017) so that the project team can effectively manage stakeholder needs and ensure their involvement is appropriately addressed.

Table 45.

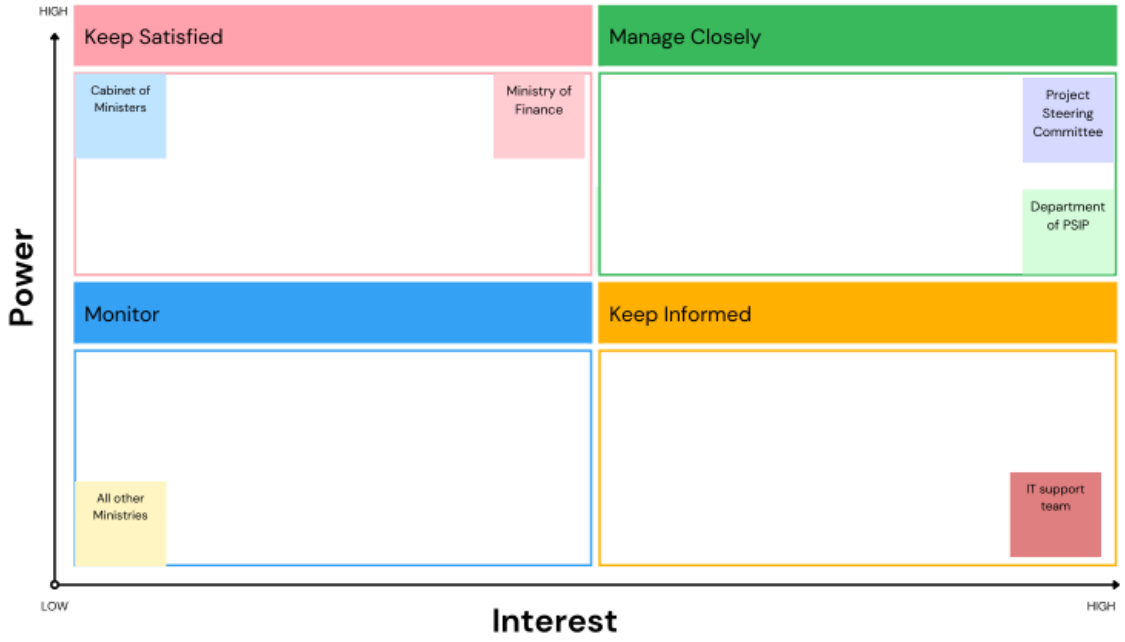
List of stakeholders

Stakeholders
Direct Stakeholders: 1. The Ministry of Finance 2. The Department of Public Sector Investment Planning 3. All other Ministries that report to the Department of Public Sector Investment Planning 4. The Department of Technology 5. Project steering committee **Indirect Stakeholders:** 6. The Cabinet of Ministers

Note: Simple table showing the direct and indirect stakeholders of the PMIS project, Created by the Author.

Figure 14.

Power/interest grid



Note: Diagram showing the power and interest of each stakeholder group for the PMIS project and the corresponding engagement response based on the power and interest, Created by the Author.

Table 46.

Stakeholder register

ID	Stakeholders	Roles - Responsibilities	Main Expectations	Major Requirements	Power/Interest (Low-Medium-High)	Comments
1	Project Steering Committee	Provide strategic oversight of the project.	The PMIS will meet the requirements of stakeholders and will be completed on time and within budget.	High-quality deliverables	High power, high interest	Manage Closely – High power as they are the highest decision-making body, high interest as their decisions ultimately impact the success of the project.
2	Department of PSIP/project team	Day-to-day oversight of the project.	The project will be completed successfully	A well-developed plan and sufficient resources	Medium power, high interest	Manage Closely – Medium power as they manage the day-to-day and have some level of control, and high interest as they are ultimately responsible for project execution.
3	Ministry of Finance	Disbursement of funds based on the advice of the PSC and Project team	The deliverables will meet the requirements for payment.	Approved deliverables	High power, medium interest	Keep Satisfied – High power as they approve payments and make disbursements for payments.
4	IT Support Team	Provide technical support	The consulting firm will deliver the product to specifications	A secure, easy-to-use, and easy-to-maintain system	Low power, high interest	Keep informed – Not involved in the decision-making, but high interest as they play a major role in providing technical support

ID	Stakeholders	Roles - Responsibilities	Main Expectations	Major Requirements	Power/Interest (Low-Medium-High)	Comments
						which can significantly affect the outcome.
5	All other Ministries	Test the system and provide feedback	The PMIS will meet the requirements	A user-friendly system	Low power, low interest	Monitor – They are not involved in the day-to-day operations or decision making however they will be beneficiaries of the final product.
6	Cabinet of Ministers	Approve the budget for Capital projects	The PMIS will be able to improve the reporting on Capital projects	Operationalization of the PMIS	High power, low interest	Keep Satisfied – They are not directly involved, but Ministers are the highest level of authority over the public service.

Note: Table describing key information about the PMIS project stakeholders and using the information about their level of interest and power to guide how they can be engaged, Created by the Author.

4.10.2 Plan Stakeholders Engagement

The Plan Stakeholder Engagement process involves developing strategies to effectively involve stakeholders based on the understanding of their needs, expectations, and ways in which they could possibly support the project, leading to its success (PMI, 2017). The stakeholder register would be a major input for this process, while the stakeholder engagement assessment matrix which categorizes stakeholders based on their current and desired level of engagement. This is presented in Table 47 below, where we see that for a successful project outcome for the PMIS project, the majority of stakeholders need to be in the supportive category, with the IT Department and the Department of PSIP team taking the lead to drive engagement and ensure alignment across all entities.

Table 47.

Stakeholder engagement assessment matrix

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Project Steering Committee				C	D
Department of PSIP/project team					C D
Ministry of Finance				C D	
IT Support Team			C		D
All other Ministries		C		D	
Cabinet of Ministers			C	D	

Note: Table showing the perceived and desired level of engagement for the stakeholder who would be involved in the PMIS project, Created by the Author.

4.10.3 Manage Stakeholder Engagement

Managing stakeholder engagement involves actively communicating and collaborating with stakeholders to meet their expectations, address concerns, and secure their support for the project (PMI, 2017). The stakeholder register as well as communication plan are critical inputs for this project as they both provide information on stakeholder requirements or needs for communication. A simple yet essential tool for managing stakeholder´s engagement is meetings, particularly status update meetings as the meetings provide a structured environment whereby important project progress updates can be shared, issues can be resolved, and stakeholders get an opportunity to be engaged and show buy-in for the project. For the PMIS project, stakeholders will generally receive updates at different frequencies as those involved in the day-to-day implementation such as the Consulting Firm and the Project Manager may need to communicate more frequently than with the Project Steering Committee or the other line ministries that will be beneficiaries.

4.10.4 Monitor Stakeholder Engagement

The Monitor Stakeholder Engagement process involves tracking stakeholder interactions, evaluating their level of involvement, and making adjustments as needed to maintain their support throughout the project so that stakeholder engagement activities prove to be efficient and effective (PMI, 2017). In addition to the stakeholder register as an input as seen in the case of many other stakeholder engagement processes, project communications previously distributed or disseminated can also serve as an input as it

allows the project team to assess its effectiveness. Work performance data is also useful as it can also provide an opportunity for the project team to assess improvements as it relates to stakeholders´ participation, and support to the project.

Useful tools and techniques that can be utilized to monitor communications include meetings where interactions by project stakeholders can be observed and assessed, and feedback which allows for the project to determine if the information received by stakeholders is adequately understood.

As a result of this process, the stakeholder register can be updated with new information that can help the project team to better engage the project stakeholders. Additionally, based on the assessment, there may be lessons learned. This would be useful if documented, and the lessons learned register for the project to be updated.

4.10.5 Roles and Responsibilities

In stakeholder engagement, the Project Manager and project office play the most critical role. All the roles and responsibilities for the PMIS development project are described in the table below.

Table 48.

Stakeholder Engagement Roles and Responsibilities

Organization	Role	Responsibility
Donor organization	Project Sponsor	- N/A
PSIP	Project Manager	● Verifies and approves the stakeholder engagement plan ● Supervises the change control process and reviews and approves change requests. ● Documents and communicates changes to the stakeholder engagement plan when change requests are approved.
PSC and PSIP	Project Team	● Participates in the validation of the stakeholder engagement plan. ● Participates in the change control process by identifying the need for changes in stakeholder engagement, and making recommendations

Organization	Role	Responsibility
ICT department and other Ministries and Departments	Other stakeholders	● Participates in the execution, and monitoring and control process

Note: Table describing the roles and responsibilities of the project stakeholders involved in stakeholder engagement, compiled by the Author.

5 CONCLUSIONS

The development of a Project Management Information system for capital projects in St. Kitts and Nevis will be transformative as it is the first of its kind that will be used for the Government of St. Kitts and Nevis. With such an important project that has the ability to impact the way capital projects, the Government´s largest investments for the country are monitored and reported on for decision-making at the highest levels, careful planning and proactive management of the project´s scope, schedule, cost, quality, risks, resources and procurement processes, with effective engagement of and communication with project stakeholders will be critical.

Using the various tools and techniques described in the sixth edition of the PMBOK Guide allowed for this comprehensive project management plan to be developed in a way that ensures the successful completion of the project if implemented according to the plan. With regard to the eleven objectives of this Final Graduation Project, the following conclusions can be drawn:

1. The project charter serves as the foundational document that briefly outlines the project´s goals and objectives, scope, and resources of the project to develop the PMIS while describing key factors such as risk, assumptions, and constraints to be considered. It will ultimately allow the project´s stakeholder to understand the project's purpose and parameters so they can better understand the project and lend their support to its implementation and success.

2. The scope management is critical to the project´s success as the processes of defining the scope, validating the scope, and then controlling the scope is necessary for ensuring the project only includes the work required to complete the process. Major outputs developed for the scope management plan of the PMIS project include the requirements traceability matrix which can be used to determine if the approved requirements are delivered at the end of the project; the scope statement which describes the project´s scope, major deliverables, assumptions and constraints; the work breakdown structure (WBS) which breaks down the project deliverables into smaller and more manageable tasks and its associated dictionary which defines the entire WBS to minimize misunderstanding as it relates to the work to be completed; and the validated deliverables for which the project is expected to deliver.
3. The schedule management plan is the foundation for ensuring all the project activities are completed on time, thus allowing the PMIS project to be completed within the required amount of time for effective and efficient use of resources. Key outputs developed for the PMIS project include the milestone list which provides deadlines for the completion of milestones; the schedule network diagram that helps to identify the appropriate sequence of activities based on the relationships that exist between them; a comprehensive activity list which provides details on the duration of each activity including the start and end dates; and the overall project schedule in the form of a Gantt chart. To properly track and monitor the progress of activities and their completion, the control schedule process incorporates a schedule tracking

guide which allows for the planned schedule to be compared to the actual schedule, and schedule delays can be easily tracked.

4. The cost management plan, much like the scope and schedule management plan, is critical to a project´s success as the cost required to complete the project activities must be determined, and the expenditure of these resources must be kept within the approved budget. The main outputs developed for the PMIS project include the cost estimate which indicates the cost required for each activity of the project; and the total budget required to complete the project. For monitoring costs and ensuring expenditure is in line with the approved budget, expenditure at a given point can simply be compared with the cumulative planned cost as this allows project managers to track expenditure and easily identify if the project is over or within budget.
5. The quality management plan establishes quality targets that must be met by the project in accordance with the requirements. For the PMIS project key outputs of the quality management planning process include the quality metrics which describe the attributes of the PMIS platform and the methods for verifying if they are met and a matrix describing all the quality management activities and the responsible person and frequency by which this responsible person must conduct the required quality checks. For quality control, the plan-do-check-act cycle is recommended as a method for ensuring there is continuous improvement in quality throughout the project.

6. The resource management plan outlines processes for the identification, acquisition and management of internal project resources. Utilizing important techniques such as the responsibility assignment matrix allowed for the roles and responsibilities of project stakeholders to be determined. The main outputs for the PMIS project as it relates to the resource management plan also include the resource breakdown structure which allows all human and physical resources required to be mapped, and the physical resources assignments which quantify the physical resources required. Important tools and techniques for acquiring members of the team, developing the team and managing the team are described in the resource management plan. It is important to note that interpersonal and team skills are important ways to effectively manage teams, and lessons learned from these interactions must be documented to allow other projects to learn from this project.
7. The communication management plan establishes how information about the project will be shared. This is then documented in the communication requirements matrix which identifies the information to be shared and the frequency for sharing, the responsible person for managing the communication, and the stakeholders who must be communicated with. For the PMIS project, appropriate communication techniques are also described to ensure that the messages being communicated are clear.
8. The risk management plan is important for identifying, assessing, and prioritizing project risks. During the processes that take place, project teams are better able to develop and implement strategies to mitigate or cope with the most critical risks.

For example, the PMIS project, a comprehensive risk register which provides information on each risk such as potential causes and consequences, a measure of the probability of occurrence and potential impact, and an outline of potential risk responses is the main output developed as a part of the risk management plan.

9. The procurement management plan is necessary for the acquisition of external goods and services for the project. Using different tools and techniques, outputs such as the source selection criteria for evaluating proposals submitted by vendors, bid documents for requesting vendor proposals, and contracts which outline the obligations of the parties to the contract are developed.
10. The stakeholder engagement plan plays an instrumental role in ensuring there is sufficient support and buy-in from project stakeholders. The PMIS project benefits from the processes to identify the stakeholders of the PMIS project, and assess their level of power and interest and those designed to bridge the gap between the perceived level of engagement and the desired level of engagement from the project.

6 RECOMMENDATIONS

The successful completion of the project to develop the PMIS for the Department of Public Sector Investment Planning presents an opportunity to improve oversight of project management for capital projects and will be useful for better management of the State´s resources. Despite this, there are always challenges that present themselves, as a key part of developing and implementing projects is hinged upon the cooperation of people. To address these challenges and ensure the project can be successful, recommendations have been developed for each management plan to consider. By implementing these recommendations, the project has a greater chance of overcoming challenges as they appear.

1. The Department of PSIP must ensure that key stakeholders are given an opportunity to contribute to the development of the project charter, and should any new information become available before approval and commencement of the project, it should be updated as necessary to reflect any required changes in the scope, goals and objectives, or schedule and cost.
2. The project manager must be very clear in communicating the requirements of the project so that stakeholders understand them and are aware of the implications of scope creep if it were to occur.
3. Oftentimes, projects are delayed due to delays in the reviewing and approval of project deliverables. The project manager must therefore ensure that the consulting firm submits deliverables on time and must actively and regularly engage stakeholders to ensure reviews and approval take place in a timely manner to avoid delaying the project.

4. When designing and implementing projects for the public sector, the Department of PSIP should ensure that they draw on the expertise of experts with knowledge of previous or related projects as this will be crucial to the development of cost estimates especially in the case of the consulting firm as that cost is the most significant.
5. The project manager must create an enabling environment that ensures that the experts at the IT Department play a leading role in the quality management process when supporting IT-related projects as their expertise will be most required during the testing and validation process for the PMIS Platform when being developed.
6. The Department of PSIP must ensure there is a thorough assessment of the skill sets within the IT department as well as an assessment of the physical resources available for the operation of the PMIS platform. In the IT staff, if there are gaps, these will need to be addressed by the IT Department urgently through internal training. For physical resources, the respective departments will bear the cost, and as such, gaps in the required IT infrastructure must be identified and addressed prior to the start of the project.
7. Although necessary, excessive meetings with stakeholders will lead to meeting fatigue. The Project Manager must therefore ensure that communication between project stakeholders is strategic while ensuring that meetings and other opportunities for updating project stakeholders are creative yet purposeful.
8. The project manager should be mindful that in addition to effectively monitoring and managing risks, documenting risks is very critical not only for this project, but also for future projects.

9. The project manager must ensure that demonstrated experience delivering similar projects is a key factor guiding the selection of a consulting firm to develop the PMIS. While the procurement process will be an open, competitive process, some consideration must also be given to firms that understand the culture and context of the Caribbean.
10. The project manager must make significant effort to build and maintain good working relationships with all project stakeholders. Their buy-in will be critical to the success of the project.

7 VALIDATION OF THE FGP IN THE FIELD OF REGENERATIVE AND SUSTAINABLE DEVELOPMENT

7.1 Sustainable Development

Sustainable development is defined as development that meets the needs at present while at the same time being able to meet the needs of future generations without compromise (United Nations, 2023). The vision for achieving sustainable development is translated into 17 goals referred to as Sustainable Development Goals or SDGs, outlining targets to be achieved by 2030. The FGP is related to the following SDGs:

1. SDG 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (United Nations, 2023). The project management plan developed by the FGP supports improved monitoring of capital projects and overall project success. Public sector capital projects are intended to bring about benefits to the people of the country. While the end product, such as a road or facility, provides benefits to a country, the large investment in capital projects often provides opportunities for employment or work to execute the capital projects, the execution of the project management plan to develop the PMIS will also provide work. The relationship to deliverables in this case would be the development of the scope management plan which incorporates the work to be done, the procurement plan which identifies the services required and the types of contracts that should be fair to service providers, the cost management plan which also ensures that allocations

for cost of services are based on costs for similar work on other projects, also contributing to fairness.

2. SDG 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation, SDG 9- Ensure healthy lives and promote well-being for all at all ages, and SDG 11 Make cities and human settlements inclusive, safe, resilient and sustainable (United Nations, 2023). The PMIS developed by the project management plan is a demonstration of innovation, while the use of the PMIS for delivering capital projects which are often infrastructure projects supports improved resilience and sustainability, and promotes well-being for the people of St. Kitts and Nevis when capital projects are delivered in the way they are intended to. In the case of the deliverables of the FGP, a relationship exists with the quality management plan and scope management plan as both ensure the PMIS meets the monitoring and evaluation needs of the Department of PSIP and the use of the PMIS improves the delivery of capital projects and the quality of the development.
3. SDG 17 - Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development (United Nations, 2023). It is noted that the PMIS developed will ensure efficiency as it relates to the use of financial resources and completion of capital projects on time and within budget. Additionally, a relationship is seen between the schedule and cost management plan of the FGP which supports the delivery of the PMIS on time and within budget.

7.2 P5 Analysis

The P5 Standard for Sustainability in Project Management is a framework that allows for the measurement of a project´s potential impact on sustainability and ensures that the 5 key areas: Product, Process, People, Planet, and Prosperity are considered and integrated into project activities (GPM Global, 2023). The FGP is

- People – The project management plan ensures there is organizational learning and local competence development as the staff of the Department of PSIP improve their project management capabilities and this leads to sustainable project outcomes. Aspects of the plan such as the procurement plan ensure there is equal opportunity in the procurement of service providers, fair competition, responsible technology and sustainable procurement practices and contracts.
- Planet – The project management plan incorporates aspects that benefit the environment. These are seen in the procurement plan which incorporates local procurement, positively impacting the local economy and reducing energy consumption as energy-efficient products and equipment are used, and the communication plan and stakeholder engagement plan which utilizes digital communication and reduces the need for physical travel for example for meetings.

7.3 Regenerative Development

It is important to note that while sustainable development today remains a desired goal for many nations, the concept of regenerative development goes further in that regenerative development does not only seek to utilize resources to meet the needs of people today and have enough for tomorrow but also seeks to use provide solutions that allow for

the strengthening the capacity of society´s support systems for there to be growth in the future (Gabel, 2016). The FGP is more aligned with sustainable development goals than regenerative development due to the nature of the capital projects for which the PMIS is developed to address, as most capital projects in St. Kitts and Nevis target the physical development of public assets. Despite this, there will be some aspects of regenerative development in the end product, the PMIS, as it will increase the overall efficiency of capital projects. Some of the benefits include:

1. Environmental Dimension - Increased efficiency in the implementation of capital projects reduces waste. For example, improved monitoring of capital projects and expenditure should result in situations where only materials required are purchased leaving little room for excess and thus reducing wastage. Less wastage of construction materials such as lumber reduces the demand for them and benefits the environment. There will also be increased efficiency in the implementation of capital projects which influences the time required to complete projects. If projects are completed on time, resources such as water and energy/electricity are only needed for the required period of time but when projects become inefficient, they extend beyond the required timeframe and can cause a strain on limited resources in St. Kitts and Nevis such as potable water which is used in construction.
2. Economic Dimension – As previously mentioned, capital projects provide job opportunities so an increase in capital projects positively impacts the economy of St. Kitts and Nevis. With improved monitoring due to the PMIS, and better management of projects, the likelihood of inefficiencies in the schedule and cost is reduced, and

this is an opportunity for the public sector to use cost savings to fund more capital projects.

3. Social Dimension – Improved efficiency in public sector projects ensures that the capital projects are able to achieve their objective which is the overall benefit to the people. Most public sector capital investments such as infrastructure of public facilities are designed to benefit the people and improve their quality of life.

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APPENDICES

Appendix 1: FGP Charter

CHARTER OF THE PROPOSED FINAL GRADUATION PROJECT (FGP)

1. Student name

Nikkita Browne

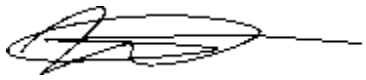
2. FGP name

Project management plan for the development of a Project Management Information System to monitor and track the progress of projects implemented by the Department of Public Sector Investment Planning in St. Kitts and Nevis.

3. Application Area (Sector or activity)

Public Sector

4. Student signature



5. Name of the Graduation Seminar facilitator

Carlos Brenes

6. Signature of the facilitator

7. Date of charter approval

December 9th 2024

8. Project start and finish date

November 4th 2024	March 31st 2025

9. Research question

How can the Department of Public Sector Investment Planning effectively monitor and track its portfolio of projects in keeping with its mandate for providing strategic guidance for the Government of St. Kitts and Nevis to implement its development agenda?

10. Research hypothesis

It is possible to create a Project Management Information System (PMIS) that can host information on all public sector projects and allow for the effective monitoring and tracking of each project so that the Department of Public Sector Investment Planning can fulfil its mandate.

11. General objective

To develop a project management plan in compliance with the standards outlined by the Project Management Institute, to establish a Project Management Information System (PMIS) for effective project monitoring at the Department of Public Sector Investment Planning in St. Kitts and Nevis.

12. Specific objectives

1. To create a Project Charter that outlines the project´s goals and objectives, scope, and resources.
2. To develop a scope management plan that defines the work required to successfully complete the Project Management Information System.
3. To formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed, monitored and managed, and ensures that the project activities will be delivered on time.
4. To develop a cost management plan that outlines how costs for the Project Management Information System will be estimated, managed and monitored to avoid cost overruns.
5. To create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed.
6. To develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed and monitored throughout the project.

7. To create a communication plan that outlines how information regarding the Project Management Information System will be effectively communicated to them.
8. To formulate a risk management plan that identifies all potential project risks and the actions required to manage them.
9. To create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for the Project Management Information System.
10. To design a stakeholder management plan that identifies project stakeholders and effective strategies for their engagement and buy-in.

13. FGP purpose or justification

In St. Kitts and Nevis, the Department of Public Sector Investment Planning (PSIP) within the Ministry of Sustainable Development is responsible for monitoring the Government´s Public Sector Investment Programme which comprises 150 projects at an estimated investment of over 1.5 billion dollars. Unfortunately, no project monitoring tools are being utilized, and many projects have experienced cost overruns and significant project delays as the line Ministries that implement them and the Department of (PSIP) that monitors implementation and tracks progress continue to seek solutions to effectively monitor, evaluate, and report on the status and performance of all the public sector projects. To aid the Department of PSIP in achieving its mandate, this Final Graduation project will create a project management plan that will guide the implementation of the project to develop a Project Management Information System (PMIS) that can be used to improve the monitoring of project performance and the tracking of results.

14. Work Breakdown Structure (WBS). In table form, describing the main deliverable as well as secondary products or services to be created by the FGP.

Final Graduation Project

1. Graduation Seminar
    1.1 FGP Deliverables
        1.1.1 Charter
        1.1.2 Work Breakdown Structure
        1.1.3 Chapter 1 – Introduction
        1.1.4 Chapter 2 - Theoretical framework
        1.1.5 Chapter 3 - Methodological framework
        1.1.6 Annexes
            1.1.6.1 Bibliography

1.1.6.2 Schedule 1.2 Graduation Seminar Approval
2. Tutoring Process 2.1 Tutor 2.1.1 Tutor Assignment 2.1.2 Communication with Tutor 2.2 Adjustments of Previous Chapters (if needed) 2.3 Chapter 4 - Development (Results) 2.3.1 Project Charter 2.3.2 Scope Management Plan 2.3.3 Schedule Management Plan 2.3.4 Cost Management Plan 2.3.5 Quality Management Plan 2.3.6 Resources Management Plan 2.3.7 Communication Management Plan 2.3.8 Risk Management Plan 2.3.9 Procurement Management Plan 2.3.10 Stakeholder Management Plan 2.4 Chapter 5 - Conclusion 2.5 Chapter 6 - Recommendations 2.6 Project Validation in Regenerative and Sustainable Development
3. Reading by Reviewers 3.1 Reviewers Assignment Request 3.1.1 Assignment of two reviewers 3.1.2 Communication with reviewers 3.1.3 Final Graduation Project Submission to Reviewers 3.2 Reviewers Work 3.2.1 Reviewer 1 3.2.1.1 Final Graduation Project Reading 3.2.1.2 Reader 1 Report 3.2.2 Reviewer 2 3.2.2.1 Final Graduation Project Reading 3.2.2.2 Reader 2 Report
4. Adjustments 4.1 Report for Reviewers 4.2 Final Graduation Project Update 4.3 Second Review by Reviewers
5. Presentation to Board of Examiners 5.1 Final Review by Board 5.2 Final Graduation Project Grade Report

15. FGP budget

The Final Graduation Project Budget is estimated at a total of: $ 2600 XCD or 962.96 USD

The breakdown is detailed below:

Item	Description	Qty	Unit cost	Total cost
1	Transportation to facilitate interviews	5	$10	$50
2	Printing and binding of FGP	1	$200	$200
3	Shipping of FGP	1	$350	$350
4	Reviewers fee	2	$1000	$2000
Total				$2600

16. FGP planning and development assumptions

1. It is assumed that the student understands the FGP requirements.
2. It is assumed that the information required from the Government of St. Kitts and Nevis to complete the Project Management Plan will be accessible.
3. It is assumed that the Department of Public Sector Investment Planning will fulfil information requests in a timely manner.
4. It is assumed that the assigned tutor will review and provide feedback in a timely manner.

17. FGP constraints

1. Time: The twelve (12) weeks allotted to finalize the Final Graduation Project is short.
2. Scope: The project management plan is limited by the data available as government departments in St. Kitts and Nevis are often data-limited and lack primary data.
3. Cost: The FGP relies on the availability of financial resources which can be a challenge when other financial obligations are considered.
4. Quality: The student may have challenges understanding and conforming to the feedback being provided by the tutors.

18. FGP development risks

1. Changes in the political landscape in St. Kitts and Nevis may result in changes in personnel at the Department of Public Sector Investment Planning, making communication and data gathering difficult.

2. Unforeseen personal issues experienced by the student may affect the quality and submission of deliverables.
3. Instability in the current electricity supply in St. Kitts and Nevis could delay the FGP process and on-time delivery of deliverables.
4. Unclear feedback from tutors will affect the student's ability to deliver a high-quality FGP .

19. FGP main milestones

Milestones are related to deliverables on the second level (deliverables) and third level (control accounts) of the WBS of section 14 of this Charter. At the same time the deliverables are related to the specific objectives (in the case of the FGP please include the times for the tutorship reviews as well as for the readership).

Deliverable	**Finish estimated date**
1.1.1 Charter	11th November 2024
1.1.2 Work Breakdown Structure	
1.1.3 Chapter 1 – Introduction	2nd December 2024
1.1.4 Chapter 2 - Theoretical framework	18th November 2024
1.1.5 Chapter 3 - Methodological framework	25th November 2024
1.1.6 Annexes	2nd December 2024
1.2 Graduation Seminar Approval	9th December 2024
2.1.1 Tutor Assignment	10th December 2023
2.1.2 Communication with Tutor	14th March 2025
2.2 Adjustments of Previous Chapters (if needed)	14th March 2025
2.3.1 Project Charter	27th January 2025
2.3.2 Scope Management Plan	27th January 2025
2.3.3 Schedule Management Plan	27th January 2025
2.3.4 Cost Management Plan	3rd February 2025
2.3.5 Quality Management Plan	3rd February 2025
2.3.6 Resources Management Plan	10th February 2025
2.3.7 Communication Management Plan	10th February 2025
2.3.8 Risk Management Plan	17th February 2025
2.3.9 Procurement Management Plan	17th February 2025
2.3.10 Stakeholder Management Plan	24th February 2025
2.4 Chapter 5 - Conclusion	24th February 2025
2.5 Chapter 6 - Recommendations	3rd March 2025
2.6 Chapter 7 - Project Validation in Regenerative and Sustainable Development	3rd March 2025
3.1 Reviewers Assignment Request	14th March 2025
3.1.1 Assignment of two reviewers	14th March 2025

3.1.2 Communication with reviewers	14th March 2025
3.1.3 Final Graduation Project Submission to Reviewers	17th March 2025
3.2.1.1 Final Graduation Project Reading	23rd April 2025
3.2.1.2 Reader 1 Report	23rd April 2025
3.2.2.1 Final Graduation Project Reading	23rd April 2025
3.2.2.2 Reader 2 Report	23rd April 2025
4.1 Report for Reviewers	28th April 2025
4.2 Final Graduation Project Update	1st May 2025
4.3 Second Review by Reviewers	1st May 2025
5. Presentation to Board of Examiners	9th May 2025
5.1 Final Review by Board	16th May 2025
5.2 Final Graduation Project Grade Report	16th May 2025

20. Theroretical framework

20.1 Estate of the "matter"

The 2024 Budget Estimates for St. Kitts alluded to the fact that there were 145 projects capital projects planned and ongoing with an estimated government investment of over 1.5 billion dollars (Government of St. Kitts and Nevis, 2023). The Department of Public Sector Investment Planning (PSIP) within the Ministry of Sustainable Development is responsible for providing guidance, monitoring and evaluation and reporting on the public sector investment programme however data is managed using basic tools such as Microsoft Excel. With a large portfolio of projects that range in complexity and stringent reporting requirements, there is a need for a Project Management Information System (PMIS).

A Project Management Information system will aid the project management team at PSIP in monitoring and reporting project performance among the other benefits to be derived by a PMIS. The creation of this project management plan for the development of the PMIS will ensure that best practices in project management are being implemented when developing the PMIS, and that the PMIS will meet the quality requirements and be delivered on time and within budget.

20.2 Basic conceptual framework

Project management, Project management knowledge areas, Regenerative development, Project Management Information Systems, Capital Projects

21. Methodological framework

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
1. To create a Project Charter that outlines the project´s goals and objectives, scope, and resources.	Project Charter	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP and Documents produced by the Department of PSIP Project Management standards.	Qualitative	Interviews Meetings Expert Judgement Document Analysis	The data available to complete the project charter lacks depth.
2. To develop a scope management plan that defines the work required to successfully complete the Project Management Information System.	Scope management plan	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP Project	Qualitative	Expert Judgement Document Analysis Interviews Benchmarking	The depth of data available to adequately build out the project´s scope, and the time available to achieve this objective given the 3-month timeframe to complete the entire FGP.

		Management standards. Journal articles Internet sources			
3. To formulate a schedule management plan that describes how the Project Management Information System´s activity schedule will be developed, monitored and managed, and ensures that the project activities will be delivered on time.	Schedule management plan	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP and Expert knowledge. Project Management standards. Journal articles Internet sources	Mixed	Expert Judgement Decomposition PMIS (Microsoft project) Analogous Estimating Document Analysis Interviews	The time available to achieve this objective given the 3-month timeframe to complete the entire FGP.
4. To develop a cost management plan that outlines how costs for the Project Management Information System will be estimated, managed and monitored to avoid cost overruns.	Cost management plan	Expert knowledge Document review Project Management standards. Internet sources	Mixed	Expert Judgement Analogous Estimating Document Analysis Cost Aggregation	The time available to achieve this objective given the 3-month timeframe to complete the entire FGP.

5. To create a quality management plan that defines the standards that need to be met by the Project Management Information System, and how they will be managed.	Quality management plan	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP Expert knowledge. Project Management standards Internet sources	Qualitative	Expert Judgement Interviews Meetings Document Analysis	The time available to achieve this objective given the 3-month timeframe to complete the entire FGP.
6. To develop a resource management plan that identifies the resources required for the Project Management Information System, and describes how they will be acquired, managed and monitored throughout the project.	Resource management plan	Interviews and meetings with relevant stakeholders including but not limited to staff members at the Department of PSIP Expert knowledge Project Management standards Journal articles Internet sources	Qualitative	Expert Judgement Responsibility assignment matrix Document Analysis Analogous Estimating Interviews	The time available to achieve this objective given the 3-month timeframe to complete the entire FGP.

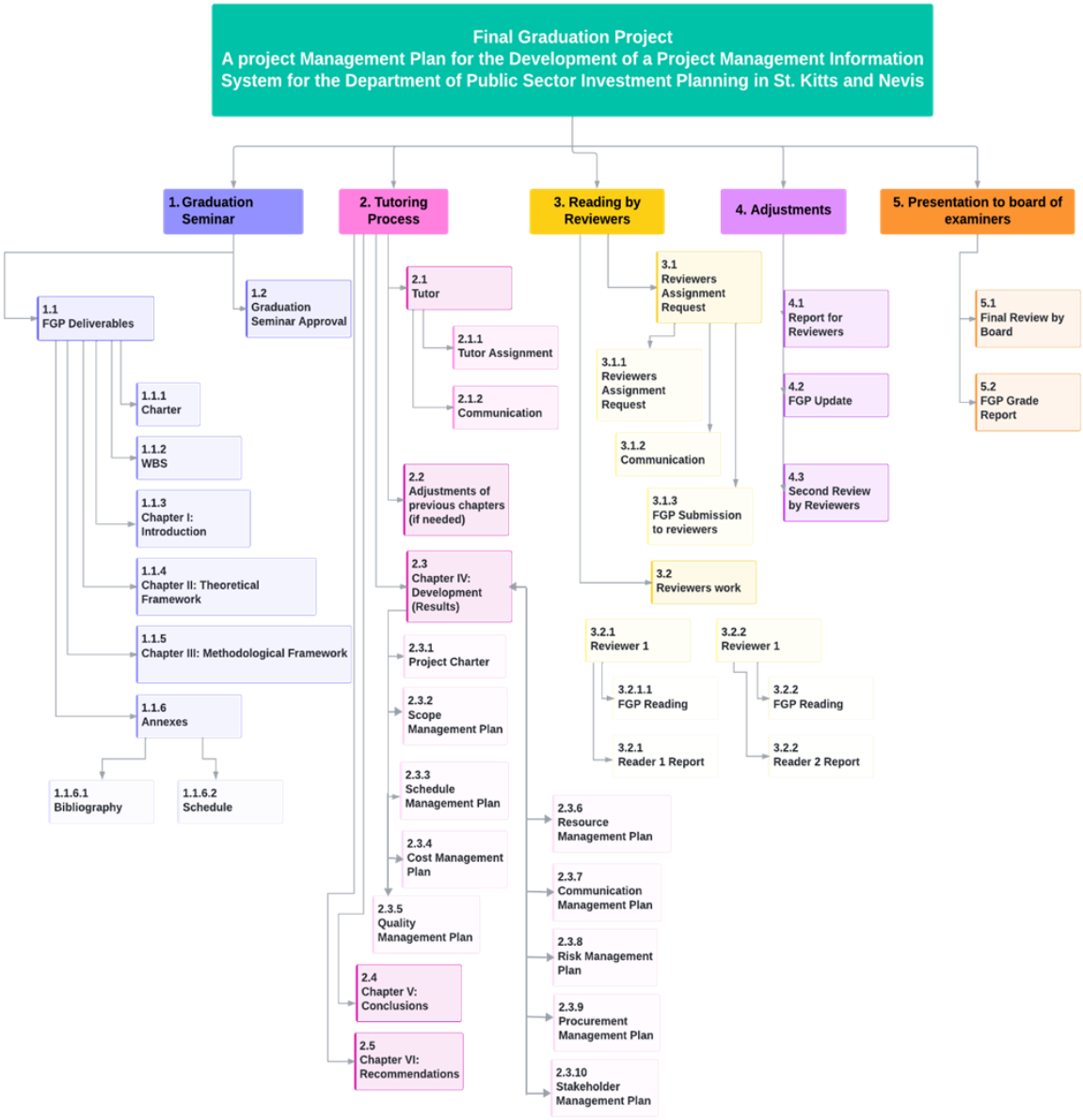
7. To create a communication plan that outlines how information regarding the Project Management Information System will be effectively communicated to them.	Communication plan	Meetings with relevant stakeholders including but not limited to staff members at the Department of PSIP Expert knowledge Project Management standards Journal articles Internet sources	Qualitative	Expert Judgement Meetings Communication Requirements Analysis Communication Technology	The time available to achieve this objective given the 3-month timeframe to complete the entire FGP.
8. To formulate a risk management plan that identifies all potential project risks and the actions required to manage them.	Risk management plan	Interviews with relevant stakeholders including but not limited to staff members at the Department of PSIP Expert knowledge. Project Management standards Journal articles Internet sources	Qualitative	Expert Judgement Document Analysis Checklist Interviews Root cause analysis Risk Probability and Impact Assessment	The time available to achieve this objective given the 3-month timeframe to complete the entire FGP.

9. To create a procurement management plan that defines the processes that will be executed to ensure timely procurement of goods and services for the Project Management Information System.	Procurement management plan	Expert knowledge Project Management standards Internet sources	Quantitative	Expert Judgement Document Analysis Data gathering	The time available to achieve this objective given the 3-month timeframe to complete the entire FGP.
10. To design a stakeholder management plan that identifies project stakeholders and effective strategies for their engagement and buy-in.	Stakeholder management plan	Meetings with relevant stakeholders including but not limited to staff members at the Department of PSIP Expert knowledge Project Management standards Internet sources	Qualitative	Expert Judgement Stakeholder Analysis Document Analysis Interviews	The time available to achieve this objective given the 3-month timeframe to complete the entire FGP.

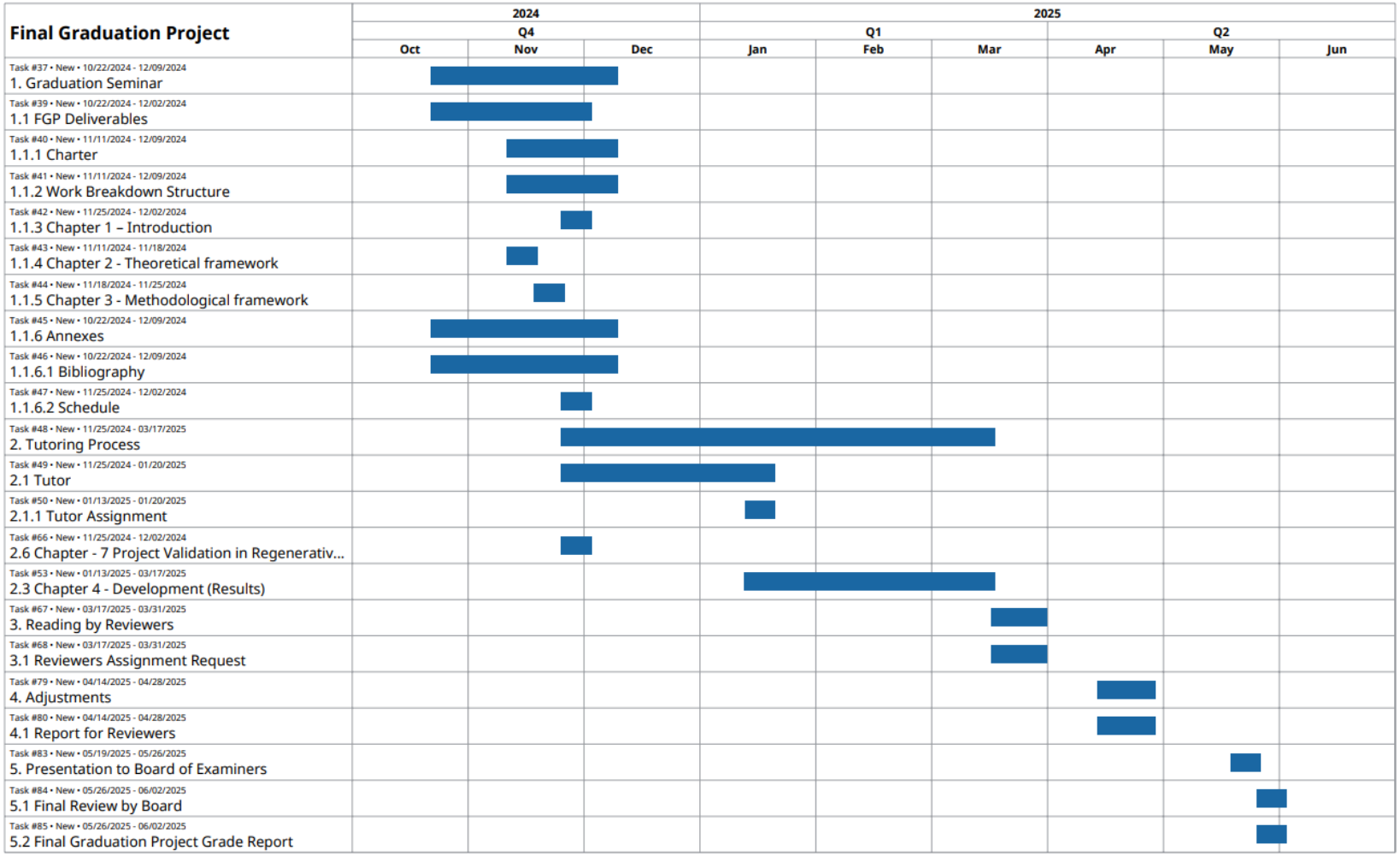
22. Validation of the work in the field of the regenerative and sustainable development.

The Final graduation project as well as the end product, the project management information system supports both regenerative and sustainable development as in the case of sustainable development both the project and the end product will have the greatest impact on the sustainability of cities, resilience in public infrastructure, sustainable economic growth, and will overall lead to the improvement of the quality of life for the people of St. Kitts and Nevis. Similarly, in the case of regenerative development, the final graduation project and the end product, the project management information system will have more of an impact on the environmental, social and economic dimension.

Appendix 2: FGP WBS



Appendix 3: FGP Schedule



Appendix 4: Preliminary bibliographical research

Balaban, S., & Đurašković, J. (2021). Agile Project Management as an Answer to Changing Environment. *European Project Management Journal*, *11*(1), 12–19. Researchgate. https://doi.org/10.18485/epmj.2021.11.1.2

Explanation: This journal article outlines ways in which agile project management has positively impacted how projects are organized and executed and will serve as a resource document when justifying the selection of the use of this type of methodology when developing the project management plan.

Bhatt, T. (2024, March 26). Implementing Agile Methodologies In Website Development Projects. *Intelivita* . https://www.intelivita.com/blog/agile-methodology-for-website-development/

Explanation: This article describes agile methodologies and their benefits when developing IT platforms and will serve as a resource document when providing justification for the selection of the use of this type of methodology when developing the project management plan.

Government of St. Kitts and Nevis. (2023). Expenditure Financial Summary By Ministry. https://mof.gov.kn/wp-content/uploads/2023/03/2024-ESTIMATES-VOLUME-II-final.pdf

Explanation: This document produced by the Government of St. Kitts and Nevis outlines the mission of the Department of PSIP and provides information on all the capital projects and associated budgets for each government Ministry for 2024. This serves as a resource for establishing the background for the project management plan.

Gutterman, Alan. S. (2023). *Project Management*. https://www.researchgate.net/publication/372761291_Project_Management

Explanation: This research document provides an overview of all the key elements of a project management plan and will therefore be a resource document for the development of this project management plan.

Micale, R., La Fata, C. M., Lombardo, A., & La Scalia, G. (2021). Project Management Information Systems (PMISs): A Statistical-Based Analysis for the Evaluation of Software Packages Features. *Applied Sciences*, *11*(23). MDPI. https://doi.org/10.3390/app112311233

Explanation: This journal article identifies useful features found in existing project management information systems and will be used as a guide when identifying desirable features of the proposed platform and incorporating them into the scope and schedule of this project management plan.

Mleke, M. N., & Dida, M. A. (2020). A Web-based Monitoring and Evaluation System for Government Projects in Tanzania: The Case of Ministry of Health. *Engineering,*

Technology & Applied Science Research, *10*(4), 6109–6115. https://doi.org/10.48084/etasr.3435

Explanation: This journal article identifies useful features found in similar project monitoring IT-based tools and will be used as a guide when identifying desirable features of the proposed platform and incorporating them into the scope and schedule of this project management plan.

Muhammad, U., Nazir, T., Muhammad, N., Maqsoom, A., Nawab, S., Fatima, S. T., Shafi, K., & Butt, F. S. (2021). Impact of agile management on project performance: Evidence from I.T sector of Pakistan. *PLoS One*, *16*(4). plos. https://doi.org/10.1371/journal.pone.0249311

Explanation: The study highlighted in this journal examines the effects of agile management practices on project performance and will be used to demonstrate the usefulness in the application of agile methodologies when developing IT platforms.

PMWeb. (2023, June 14). *How can Project Owners in the Public Sector Have a Quick Solution to Monitor, Evaluate and Report their Projects' Portfolio Performance?* PMWeb. https://pmweb.com/how-can-project-owners-in-the-public-sector-have-a-quick-solution-to-monitor-evaluate-and-report-their-projects-portfolio-performance/

Explanation: This article delves into the use of project management information systems in addressing the challenges faced in monitoring, evaluating, and reporting projects' performance.

Project Management Institute. (2019). *Practice standard for work breakdown structures.* (3rd ed.). Project Management Institute, Inc.

Explanation: This resource provides a step-by-step guide on the development of work breakdown structures and will be a key resource document for developing project schedules and budgets.

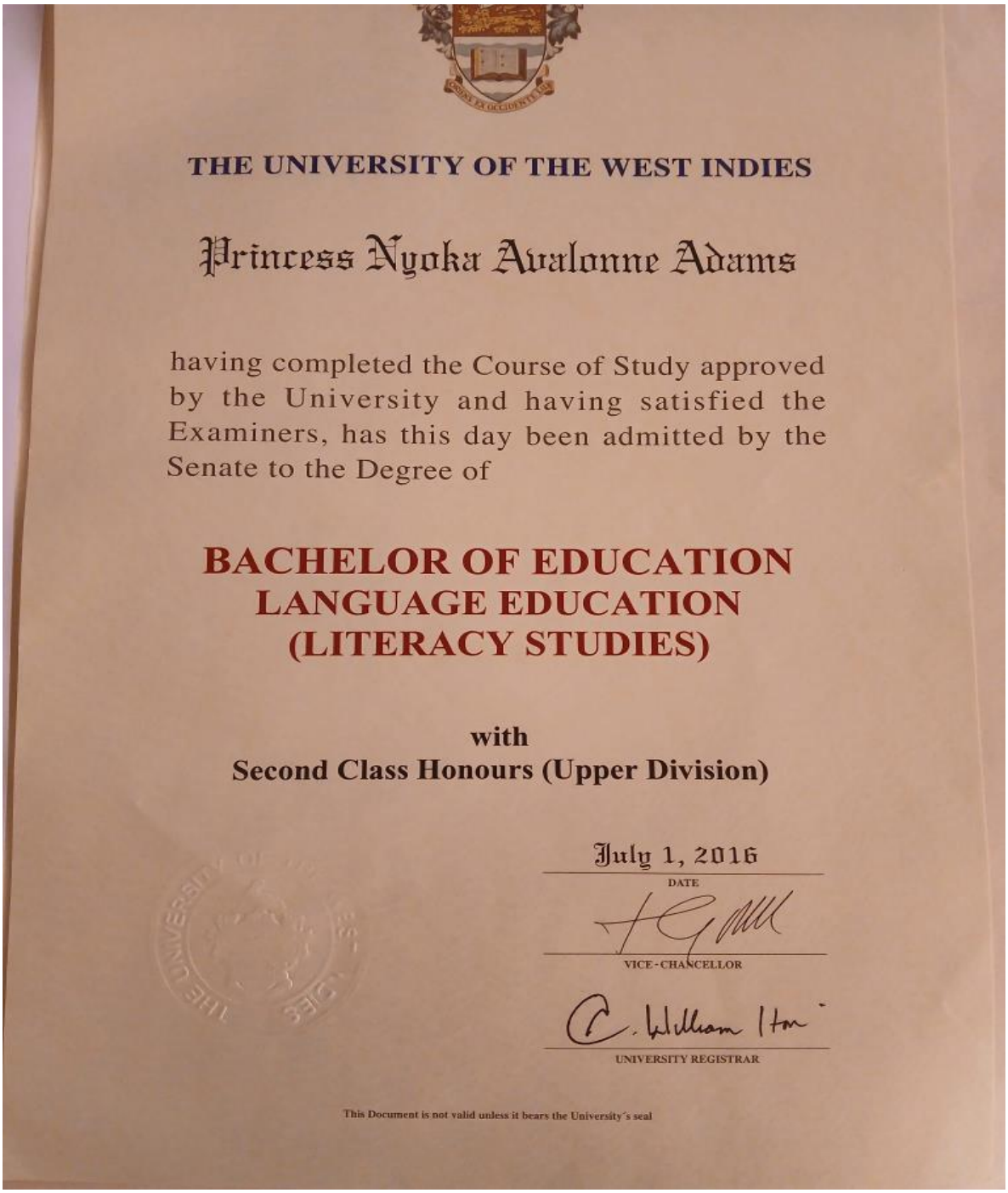
Project Management Institute. (2021). *Guide to the Project Management Body of Knowledge (PMBOK® guide)* (7th ed.). Project Management Institute.

Explanation: The PMBOK provides guidelines on the complete list of project management domains and the key principles of project management. It will be a key resource document in developing this project.

Van Besouw, J., Bond-Barnard, T., & Bond-Barnard, T. (2021). Smart Project Management Information Systems (SPMIS) for Engineering Projects -Project Performance Monitoring & Reporting. *International Journal of Information Systems and Project International Journal of Information Systems and Project Management*, *9*(1), 78–97. https://doi.org/10.12821/ijispm090104

Explanation: This article delves into the importance of monitoring and reporting in projects, and identifies useful features found in existing project management information systems that will be used as a guide when identifying desirable features of the proposed platform.

Appendix 5: Philologist Credentials



THE UNIVERSITY OF THE WEST INDIES

Princess Nyoka Avalonne Adams

having completed the Course of Study approved by the University and having satisfied the Examiners, has this day been admitted by the Senate to the Degree of

BACHELOR OF EDUCATION
LANGUAGE EDUCATION
(LITERACY STUDIES)

with
Second Class Honours (Upper Division)

July 1, 2016
DATE

VICE-CHANCELLOR

UNIVERSITY REGISTRAR

This Document is not valid unless it bears the University's seal

Appendix 6: Philologist Review and approval

19th April, 2025

Academic Advisor
Masters Degree in Project Management
Universidad para la Cooperacion Internacional

Re: Philological REview of Final Graduation Project Submitted by Nikkita Browne in partial fulfillment of requirements for a Master's Degree in Project Management .

Dear Academic Advisor:

With this letter, I confirm that I have reviewed the Final Graduation Project (FGP)submitted by MPM candidate Nikkita Browne entitled " Project Management Plan for the Development of a Project Management Information System to monitor and track the progress of projects implemented by the Department of Public Sector Investment Planning in St.Kitts and Nevis."

I hereby confirm that Ms. Browne has made all the necessary corrections to the FGP as I have advised as philologist. It is my professional opinion that the document meets the literary and linguistic standards in written English as required for the Universidad para la Cooperacion Internacional.

Warm Regards,

Princess Nyoka Adams
Philologist