UNIVERSIDAD PARA LA COOPERACIÓN INTERNACIONAL
(UCI)

# PROJECT MANAGEMENT PLAN FOR THE DEVELOPMENT OF AN INTRANET FOR THE ECONOMIC DIVISION IN THE MINISTRY OF ECONOMY AND FINANCES

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## DEDICATION

This research is particularly dedicated to my two sons, Sanderny Doryan and Berthony Dylan, as well as my wife, Sandy Jean, who has never stopped pushing me to reach the end of the tunnel despite the difficult period of Covid-19. She never traded words of encouragement to me, and she never ceased to remind me that my ability, perseverance, and sense of responsibility should enable me to achieve my goals.

This work is also dedicated to my mother and my father, who never traded in their service, patience, and support. Thanks to their sacrifices, today I become a professional of a career in the service of my country.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| APM | : The Association for Project Management |
| EAC | : Estimate at completion |
| ED | : Economic Division |
| EVM | : Earned value management |
| FGP | : Final graduation project |
| MEF | : Ministry of Economy and Finances |
| PERT | : Program Evaluation and Review Technique |
| PNET | : Probabilistic network evaluation technique |
| PMI | : Project Management Institute |
| PMIS | : Project management information system |
| PMBOK | : Project Management Body of Knowledge |
| PMO | : Project management office |
| SDLC | : System development life cycle |
| TEU | : Technical execution unit |
| UCI | : University for the International Cooperation |

## EXECUTIVE SUMMARY

Managing and disseminating economic and statistical information are vital for the credibility of the Ministry of Economy and Finances. A secure and efficient intranet coupled with a solid database is an important information system that any entity in the public administration needs to increase productivity and provide quality service to the national and international communities. Data can be easily collected, treated, analyzed, stored in a secured database with limited accessibility, and posted online for the public. The Economic Division is the unique department within the ministry that has the authority to centralize data and provide information to the decision makers and all of the local, regional, national, and international scientific communities.

The Economic Division (ED) is part of six technical departments within the Ministry of Economy and Finances (MEF), which is a functional organization where staff is grouped hierarchically by function. The Economic Division has only one service called economic studies, which has the mission to monitor economic activities and make forecasts. It manages a large amount of data through its studies and forecasting sub-division and monitors projects for national and international donors through its governance and international sub-division for cooperation. Currently, the Economic Division has three (3) directions and three (3) services and counts fifteen (15) permanent employees.

Currently, the Economic Division has no experience in initiating or planning projects. It does not have any project management framework to plan, manage, and monitor projects. Creating a project management plan to initiate and plan projects as a result of this research will be the cornerstone for the success of this software product. Additionally, it will become vital for the ministry to engage in the intranet development project, since it will enhance its capacity to plan projects, particularly information system projects, by specifying all inputs, tools, and techniques that should be used in the project management process.

The lack of guidelines, procedures, templates, and management tools to initiate, plan, and manage projects can undermine the development progress of all projects and lead to unorganized implementation. The purpose of this final graduation project (FGP) consists of creating a project management plan that will be very useful for project planning in order to increase the probability of project success. It will render a framework that can serve as a model for other projects in the future. It will define the basis of all project work and how it will be performed. It will also provide the opportunity to strengthen the capacity of the ministry to better manage projects in the short term and to pave the way to create a PMO in the medium and long term that defines and maintains standards for project management within the organization.

The general objective of this final graduation project (FGP) is to create a project management plan using the practice standards and frameworks of the Project Management Institute (PMI) for an intranet development project for the Economic

Division in the Ministry of Economy and Finance in order to collect, analyze, manage, store, and publish economic and financial data. The specific objectives are to develop a project charter that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities, to formally authorize the existence of a project and provide the project manager with the authority to apply organizational resources to project activities by creating a scope management plan, to develop a stakeholder management plan to identify stakeholders and develop strategies to effectively engage them, to manage the timely completion of the intranet project by developing a schedule management plan, to create a cost management plan to ensure that the project can be completed within the approved budget, to develop a quality management plan to ensure that the project will satisfy the stated or implied needs for which it was undertaken, to create a resource management plan to identify and manage materials and human resources for the successful completion of the project, to develop a communication management plan to ensure the timely and effective communication of the project performance and other key information, to develop a risk management plan to identify and prioritize risks in the project and develop a risk response plan, and to develop a procurement management plan to purchase products and services needed from outside the project team.

The methodology used for this research was analytical, observational, and quantitative. Interviews were conducted with senior managers, sponsors, and members of the project team, and they were used in data collection. The information that was found was analyzed for the development of a methodological solution through an in-depth analysis and the identification of appropriate strategies and process development. Other information sources include reference books, literature reviews, and articles. However, the main source of information was gathered from the Guide of Project Management Body of Knowledge (PMBOK® Guide, 6th Edition), which was used to develop the project management plan for the intranet development project.

In conclusion, the Ministry of Economy and Finances should conduct their future projects using good project management principles. Therefore, a project management plan with all of the subsidiary plans must be incorporated, and it will serve as a guide towards the completion of the project complying with the constraints of time, budget, quality, and scope.

One important element of the recommendations consists of proper communication being maintained by the project team and the relevant stakeholders to ensure a complete understanding of the requirements and deal with issues in a timely manner. In addition, the project manager and the team should adhere to strict budgetary constraints. The intranet development must be properly maintained to guarantee customer satisfaction long after its deployment. Finally, the ministry could seek to undertake similar or larger projects in the future after having gained project management skills and experiences.

# INTRODUCTION

## 1.1. Background

The Ministry of Economy and Finances (MEF) is part of the central administration of the government of Haiti, which currently has 22 ministries. This ministry contains six technical departments, five decentralized organizations and six autonomous organizations. The ministry also has a Technical Execution Unit (TEU), which coordinates and monitors development projects for the local government and international donors. Managing projects becomes a daily task for the ministry.

The Economic Division (ED) is one of the most strategic divisions at the Ministry of Economy and Finance (MEF). One of the main tasks of this department consists of collecting statistical data allowing the monitoring of economic activities and making forecasts.

The Economic Division also manages a large amount of data through its studies and forecasting sub-division, and it monitors projects for national and international donors through its governance and international sub-division for cooperation. All data regarding economics and financial projects is managed by employees in an Excel file located in a centralized desktop with limited storage capacity. To better organize their process of collecting data, the Economic Division decided to use an intranet with a consolidated database system. The ministry sent a request for financing to the World Bank for the project, and the bank answered positively. It claims for a project proposal.

Currently, the Economic Division has no experience in initiating and planning projects. It does not have any project management framework to plan, manage, and monitor projects. Creating a project management plan to initiate and plan projects as a result of this research will be the cornerstone for the success of this software product.

Completing this project can considerably improve the visibility of the ministry, open the door for new projects, improve the relationship between the ministry and its users, provide funding requirements for various project

phases, identify the project team and project stakeholders, and list the various criteria that the product should attain to meet the requirements.

## 1.2. Statement of the Problem

There is a lack of guidelines, procedures, templates, and management tools to initiate, plan, and manage projects at the Economic Division. Due to the size of project, the type of organization, and the level of complexity of the project, it becomes vital to create a project management plan.

Implementing the final graduation project will provide the opportunity to have a framework that can serve as a model for other projects in the future. It will define the basis of all project work and how it will be performed. It will also provide the opportunity to strengthen the capacity of the ministry to better manage projects in the short term and to pave the way to create a PMO in the medium and long term that defines and maintains standards for project management within the organization. The organizational process asset of the ministry will be updated with this plan, and the problem with the lack of planning projects will be solved.

## 1.3. Purpose

The purpose of this final graduation project (FGP) consists of creating a project management plan that will be very useful for project planning in order to increase the probability of project success. The ministry has a project unity that is very skillful in monitoring social and economic projects and does not have experience in planning information system projects.

The creation and use of the project management plan will provide the opportunity to better define the project objectives, quality metrics, milestones, success criteria, resource allocation, budget, and all components needed to ensure the project success. Given that this is the ministry’s first experience in managing an information technology project, the project management plan will become an organizational asset for the

ministry that might be used as a framework for future projects in other domains.

The intranet development project is very crucial for the ministry and for national and international communities as final users of the product. It should be carefully planned to meet the needs of the scientific community, which uses data for doing their jobs in situ or remotely.

## 1.4. General Objective

To create a project management plan using the PMBOK® Guide, 6th Edition, and standards within the Project Management Institute (PMI) as main reference for an intranet development project for the Economic Division in the Ministry of Economy and Finance in order to collect, analyze, manage, store, and publish economic and financial data.

## 1.5. Specific Objectives

1. To develop a project charter that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.
2. To create a scope management plan in order to ensure that the project includes all the work required, and only the work required, to complete the project successfully.
3. To develop a stakeholder management plan to identify stakeholders and develop strategies to effectively engage them
4. To create a schedule management plan in order to be able to track the progress of the different activities to ensure the timely completion of the intranet project.
5. To create a cost management plan to ensure that the project can be completed within the approved budget.

6. To develop a quality management plan to ensure that the project will satisfy the stated or implied needs for which it was undertaken.
7. To create a resource management plan to identify and manage materials and human resources for the successful completion of the project.
8. To develop a communication management plan to ensure the timely and effective communication of the project performance and other key information.
9. To develop a risk management plan to identify and prioritize risks in the project and develop a risk response plan.
10. To develop a procurement management plan to purchase products and services needed from outside the project team.

# 2 THEORETICAL FRAMEWORK

## 2.1 Company/Enterprise Framework

### Company/Enterprise Background

The Economic Division (ED) is part of six technical departments within the Ministry of Economy and Finance (MEF), which is a functional organization where staff is grouped hierarchically by function. The Economic Division has only one service called economic studies, which has the mission to monitor economic activities and make forecasts. The economic function of the ministry has been very weak due to the scarcity of this division. Since 2013, the ministry undertakes reforms that aim to reevaluate its economic functions in order to strengthen its financial and economic governance through the consolidation of the statistical data collection process in order to meet the needs of policy makers and the community. These reforms also aim to strengthen the macroeconomic analysis and forecasting function of the ministry and develop a new function called economic promotion.

These reforms have promoted the emergence of three (3) directions and three (3) services within the Economic Division, which are the following:

- Economic studies and forecasting: Its function is to monitor economic activities and make forecasts.
- Governance and international division for cooperation: It makes the coordination with international donors, manages the ministry project portfolio, and monitors key performance indicators for budget support disbursement.
- Economic promotion direction: It is responsible for the development of public and private enterprises and conducts general and specific studies to better understand the macroeconomic and microeconomic situation and to promote economic growth by stimulating investment.

Reforms have also provided the opportunity for this division to follow up with the program and project through its governance and international direction for cooperation.

Currently, the Economic Division counts fifteen (15) permanent employees against four (4) before reforms.

### 2.1.1 Mission and Vision Statements

**Mission Statements**

*To meet the needs of policy makers and data users by regularly providing quality economic and financial statistics through a well-organized, reliable, accessible, and secure information system*

Through this mission, the Economic Division needs to have a consolidated statistics database of the economy that permits to have updated statistical series in time. Providing a project management plan that allows the Economic Division to succeed its intranet project represents a cornerstone for the success of its mission.

**Vision Statements**

*To raise the Economic Division to the rank of general management and to develop its ability to anticipate, adapt, and innovate, intelligently in the face of an outside world and a rapidly changing population, when facing various challenges, particularly demographic, ecological, and technological*

It becomes obvious that this vision cannot materialize without a solid information system that represents the socle of this mutation. The intranet development will be the first of the innovative packages that the ministry would want to succeed. The result of this FGP, which is the creation of a management plan for the intranet project, will enhance the capacity of the ministry to plan projects, particularly information system projects, by specifying all inputs, tools, and techniques that should be used in the project management process.

### 2.1.2 Organizational Structure

The Ministry of Economy and Finance (MEF) is a functional organization where staff is grouped hierarchically by function. The Economic Division (ED) is under the

supervision of the general management, which contains five (5) departments. Figure 1 below presents the organizational structure of the Ministry of Economy and Finances. The Economic Division is now divided into three (3) services of which the information system where the project management plan will be created for the intranet development project. Each direction has a director, deputy director, chief of service, and dedicated staff.

The Economic Division is currently a small department staffed with fifteen (15) permanent employees. This number can be increased to twenty (20) including operational and project team members while executing the intranet development project.

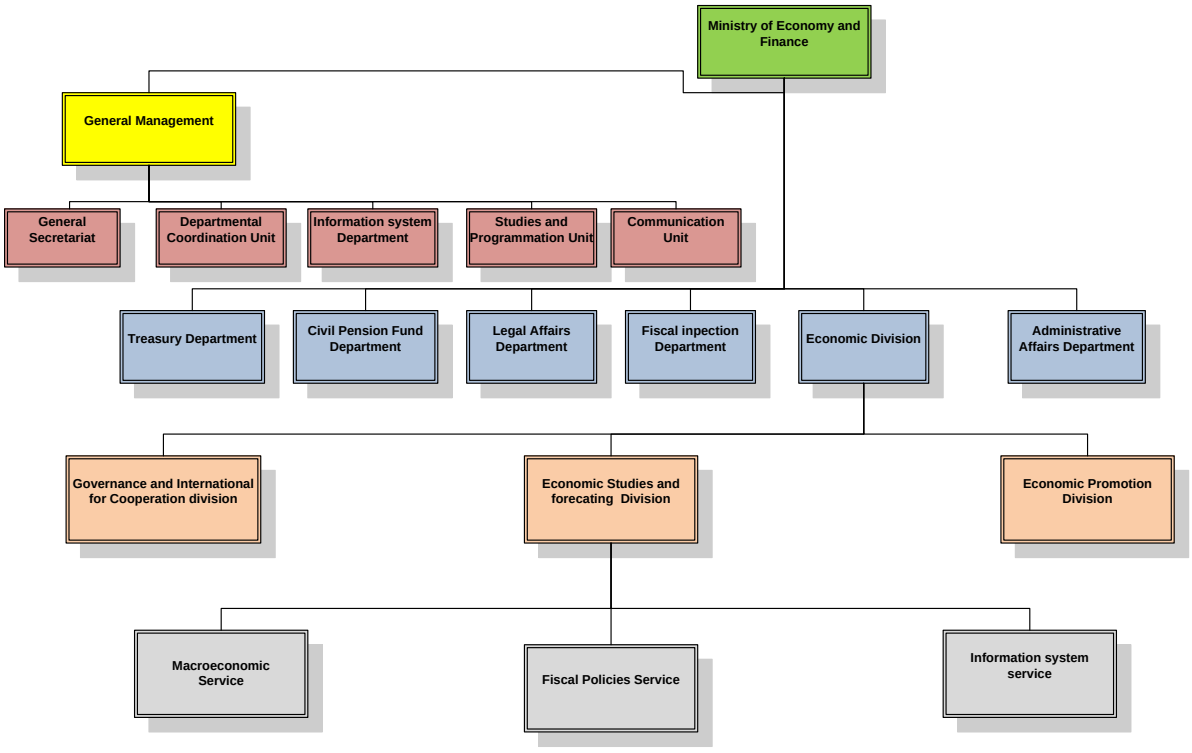



Figure 1:Organizational Structure (Source: Ministry of Economy and Finances, 2021)

### 2.1.3 Products Offered

The Ministry of Economy and Finances (MEF) makes information on the national economy in general available to the community. They can be found on its website, www.mef.gouv.ht, and in its regular publications, such as: government statistics,

the economic conjuncture, survey reports of the Haitian Institute of Statistics and Informatics, etc. Other information also concerns the administrative procedures for obtaining public services. The taxpayer's guide of the tax office, the publications of the pension fund, and those of the Fiscal Inspection department on customs exemptions are examples.

Currently, these statistics are produced by many departments within the ministry, and they are not centralized. The Economic Division is responsible for formatting and posting them on the website, which is a minor task for this division. As the ministry has decided to organize the data by developing an intranet combined with a consolidated database project, the project management plan will provide a framework to identify the main stakeholders well to ensure that the project includes all work required to evaluate the quality of the posted data and mobilize adequate resources to make quality information available to the public.

## 2.2 Project Management Concepts

### 2.2.1 Project

The word project is often used to describe something outside the normal day-to-day work. In some fields, such as research, software design, and construction, the normal day-to-day work is carrying out projects.

From an academic perspective, a project is a temporary organization to which resources are assigned to do work to bring about a beneficial change (Turner, 2006, p. 1).

The Association for Project Management (APM) in the United Kingdom defines a project as a unique, transient endeavor undertaken to achieve a desired outcome (APM, 2006, p. 150).

However, the definition provided by the Project Management Institute (PMI) broadly covered all aspects of the word project.

A project is a temporary endeavor undertaken to create a unique product, service, or result (PMI, 2017 p.4).

A project has the following attributes:

- It has a unique purpose.
- It is a temporary endeavor.
- It drives changes.
- It is developed using progressive elaboration.
- It often requires resources from various areas.
- It should have a primary customer or sponsor.

All of these attributes show that the development of an intranet is a project that has a unique purpose, and it takes place in an atmosphere of uncertainty. The project management plan that will be created will prove the temporary characteristic of the intranet development project. It will have a definite beginning and end. At the initiating stage, the Economic Division will commonly be referred to as being in the current state. The project management plan will show change driven by executing the project, and it will present the future state of this division as described in the vision statement. As the project management plan concerns the information system development, it is obvious that it will be developed using progressive elaboration. The project management plan will define the different milestones, test dates, and the approval before moving to the other stage of the project. The project management plan of the intranet project will present the project sponsors and beneficiaries through its stakeholder management plan.

### 2.2.2 Project Management

According to the Association for Project Management (APM), project management is the application of processes, methods, skills, knowledge, and experience to achieve specific project objectives according to the project acceptance criteria within the agreed parameters. Project management has final deliverables that are constrained to a finite timescale and budget.

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements PMI, 2017, p.10).

Project management methods can be applied to any project. They are often tailored to a specific type of project based on the project size, nature, industry, or sector.

The construction industry, which focuses on the delivery of things like buildings, roads, and bridges, has developed its own specialized form of project management that is referred to as construction project management, in which project managers can be trained and certified. The information technology industry has also evolved to develop its own form of project management that is referred to as IT project management, which specializes in the delivery of technical assets and services that are required to pass through various lifecycle phases, such as planning, design, development, testing, and deployment.

Currently, the Economic Division has no project management framework that includes project management process groups, knowledge areas, tools, and techniques. The result of the FGP will serve as a model to help internal project stakeholders understand the project management plan as well as educate them on best practices. The intended outcome of this FGP will help to foster departmental cohesion, portfolio expansion, and organizational growth.

### 2.2.3 Project Life Cycle

Buchanan and Boddy said the following: “a project is a unique venture with a beginning and an end” (1992, p.8). The bit in the middle is where most of the work is done. We say that a project has a life cycle, based on an analogy with living things that are born, grow, and live for a period of time doing things such as consuming food and water, breathing, moving, and then finally ending (death).

The project life cycle is the series of phases that a project passes through from its start to its completion (PMI, 2017, p.19). Phases refer to a collection of logically related project activities that culminate in the completion of one or more deliverables.

There is no single life cycle that applies to all projects; although certain types of projects will be associated with a particular lifecycle. We begin by describing a basic life cycle and then discuss some variations, which may provide an appropriate model for a given situation.

A project lifecycle can be a predictive, iterative, incremental, adaptive, or hybrid model. The phases of the life cycle development can be groups in two generic

project life cycles (Joshua Boyde (2014). A Down-To-Earth Guide to SDLC Project Management, Joshua p.36)

1) Linear/Waterfall

2) Iterative and Agile

The project life cycle contains five (5) phases: initiating, planning, executing, monitoring and control, and closing. Figure 2 below shows the life cycle for projects in a generic iterative and agile lifecycle.

As the FGP is related to the development of an intranet, which is a system/software development, it becomes important to mention the own software development project lifecycle. Figure 3 displays the system/software development life cycle, which has almost fifteen (15) phases for a waterfall life cycle.

Finding the best model that fits with the project is the responsibility of the project management team. The Economic Division is in its first step in initiating and planning projects, particularly the software/system development. The FGP outcome will provide a project life cycle that will assist the Economic Division in initiating, planning, and managing projects.

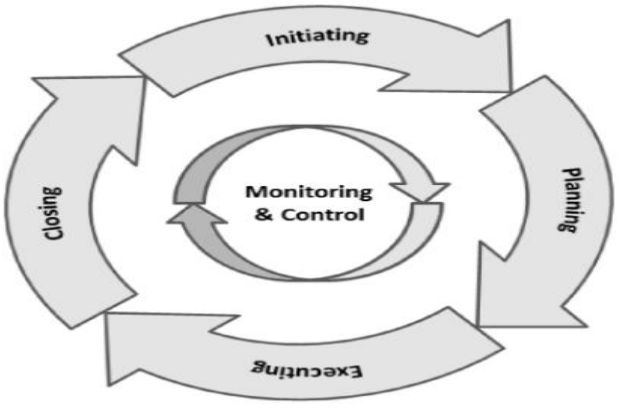



**Figure 2: Project Lifecycle Outlined as an Iterative Method**
**( Source : Reprinted from A Down-To-Earth Guide to SDLC Project Management by Joshua Boyde, p.40. Copyright 2014 by the author)**

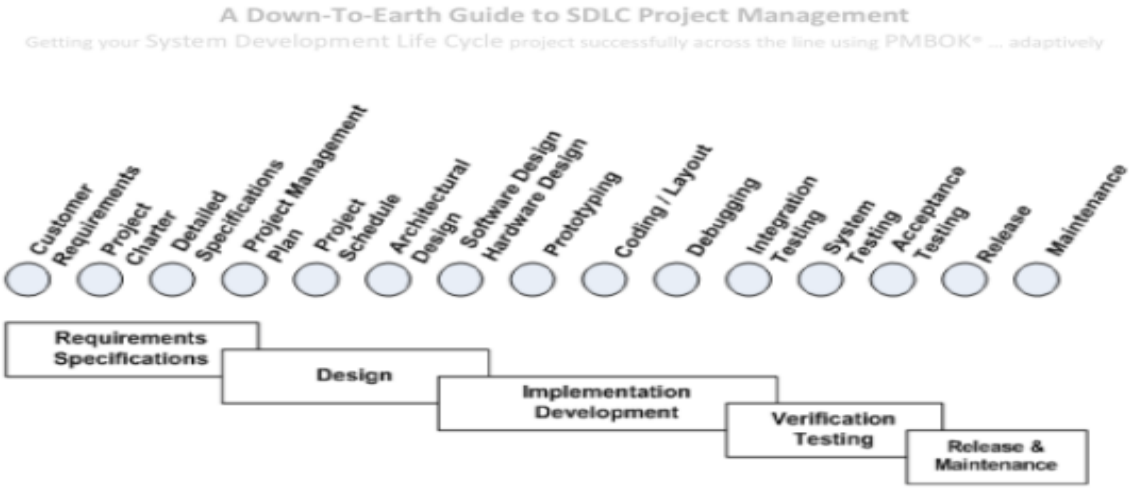



**Figure 3 : SDLC Related to a Waterfall Life cycle**
**( Source : Reprinted from "A Down-To-Earth Guide to SDLC Project Management, by Joshua Boyde, p.51. Copyright 2014 by the author )**

### 2.2.4 Project Management Processes

A project management process is an administration process for the planning and control of the services or the implementation of a project. This process begins after the approval of the customer; it is based on the contract and is targeted on the initial values of the process and the general management of a project.

The project management process requires a specific configuration that contains the project management documentation, project plans, project management methods, information exchange (individual interviews, project meetings, project workshops, etc.), and resources for the project planning and project implementation (Project Management Glossary (2020)).

The PMI defines the project management process as an execution of a series of project management activities. Every project management process produces one or more outputs from one or more inputs by using appropriate project management tools and techniques. Project management processes are grouped into five categories known as project management process groups (or process groups). The process groups are seldom discrete or one-time events; they are overlapping activities that occur throughout the project. Figure 5 illustrates how the process groups interact and shows the level of overlap at various times.

The five (5) process groups are the following:

**Initiating process group:** They are processes performed to define a new project or a new phase of an existing project by obtaining the authorization to start the project or phase.

**Planning process group:** They are processes required to establish the scope of the project, refine the objectives, and define the course of action that is required to attain the objectives that the project was undertaken to achieve.

**Executing process group:** They are processes performed to complete the work defined in the project management plan to satisfy the project specifications.

**Monitoring and controlling process group:** They are processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.

**Closing process group:** They are processes performed to finalize all activities across all process groups to formally close the project or phase.

Figure 6 presents the five (5) project management processes and their interaction.

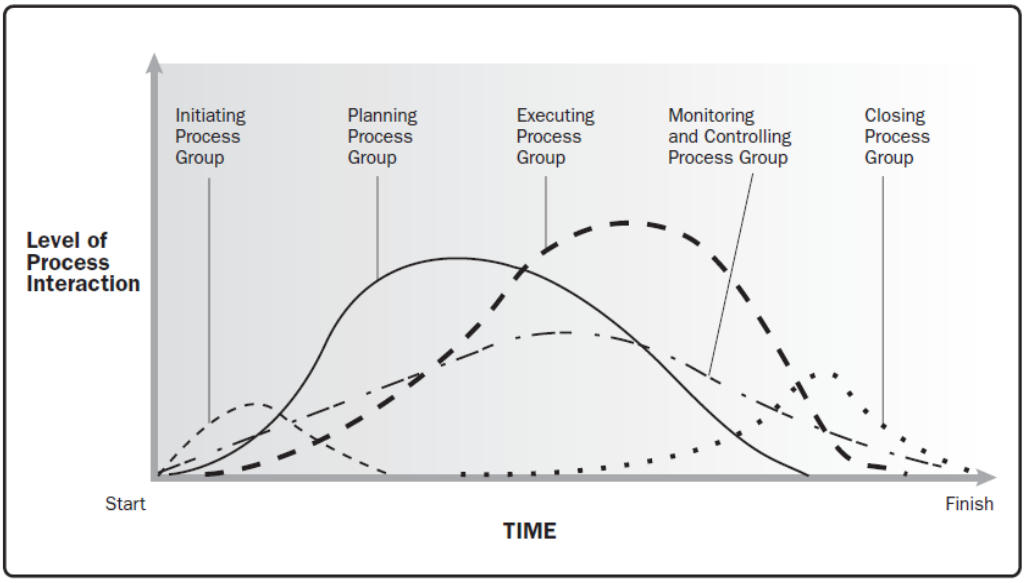



**Figure 4 : Process Groups Interacting in a Phase or Project**
**(Source: Reprinted from A Guide to the Project Management Body of Knowledge PMBOK Guide (p. 555), Copyright 2017 by Project Management Institute Inc)**

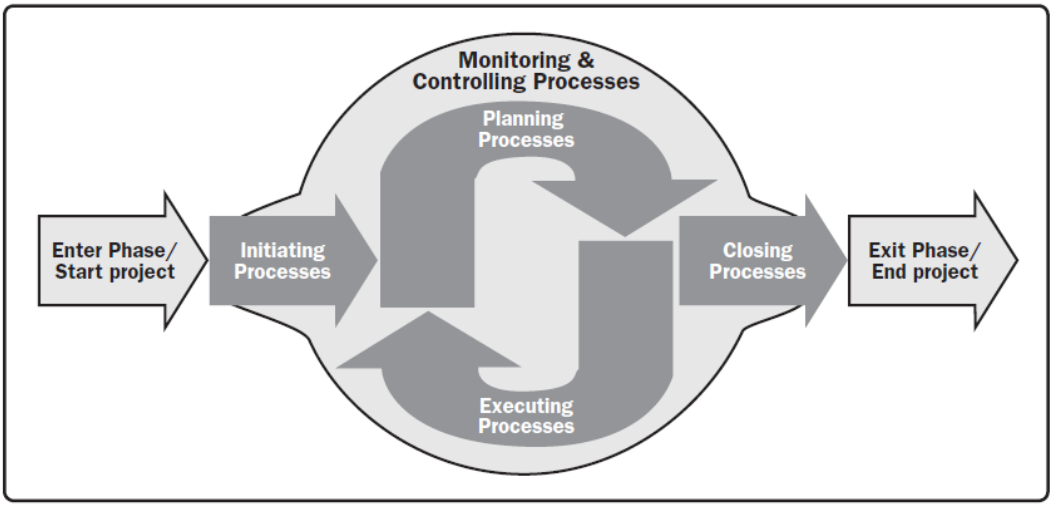



**Figure 5: Project Management Process Groups**
**(Source: Reprinted from A Guide to the Project Management Body of Knowledge PMBOK Guide (p. 561), Copyright 2017 by Project Management Institute Inc)**

Only the processes involved in initiating and planning a project will be used to develop the project management plan for the Economic Division intranet development project. The project management plan will be a compilation of subsidiary documents created as a result of each initiating and planning process activity.

### 2.2.5 Project Management Knowledge Areas

A knowledge area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. There are ten (10) identified knowledge areas (PMI, 2017, p. 23), and they are used in the majority of projects most of the time. The ten knowledge areas described in this guide are the following:

**Project integration management:** It is an overarching function that coordinates the work of all other knowledge areas. It affects and is affected by all of the other knowledge areas.

**Project scope management:** It involves working with all of the appropriate stakeholders to define, gain written agreement for, and manage all work required to complete the project successfully.

**Project schedule management:** It includes estimating how long it will take to complete the work, developing an acceptable project schedule given the cost-effective use of available resources, and ensuring the timely completion of the project.

**Project cost management:** It consists of preparing, managing and controlling the budget for the project.

Controlling project costs involves a two-step process:

1. Calculating the variance against the baseline

The project will also use the following metrics: earned value (budgeted cost of the scheduled work), actual cost (actual cost of the work performed), and planned value (budgeted cost of the scheduled work). These three numbers will then be combined to provide critical statistics, such as the schedule variance (SV), cost variance (CV), schedule performance index (SPI), and cost performance index (CPI). The schedule variance (SV) and cost variance (CV) are two essential parameters in earned value management (EVM). They analyze the progress of a project in terms of schedule and cost. The indices are also vital in the evaluation of the project, as they assess the efficiency of the project and, consequently, its performance.

1. Schedule variance (SV) is “a measure of schedule performance expressed as the difference between the earned value and the planned value” (PMI, 2013, p. 218). It indicates the point at which the project is at any given time. It is calculated using the following equation: SV = EV - PV.

2. Cost variance (CV) is “the amount of budget deficit or surplus at a given point in time, expressed as the difference earned and the actual cost” (PMI, 2013, p. 218). It is calculated using the following equation: CV = EV - AC.

3. Schedule performance index (SPI) is “a measure of schedule efficiency expressed as the ratio of earned value to planned value” (PMI, 2013, p.219). It can be derived using the following formula: SPI = EV/PV.

4. Cost performance index (CPI) is “a measure of the cost efficiency of budgeted resources, expressed as a ratio of earned value to cost” (PMI, 2013, p. 219). The formula used to compute this index is the following: CPI = EV/AC.

2-Planning corrective or preventive actions

Cost control plays a huge role in bringing attention to some areas of a project that are not performing well. It helps in determining whether a project activity is performing efficiently or inefficiently. It allows the stakeholders and senior officials to investigate the matter of underperformance and take the necessary steps.

**Project quality management:** It ensures that the project will satisfy the stated or implied needs for which it was undertaken.

**Project resource management:** It is concerned with making effective use of the people and physical resources needed for the project.

Acquire resources is “the process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work” (PMI, 2017, p. 329).

**Project communication management:** It involves generating, collecting, disseminating, and storing project information.

**Project risk management:** It includes identifying, analyzing, and responding to risks related to the project.

Probability and Impact Scales

Impact and probability are the two main components of risk analysis. Assessing impact versus probability is common in order to categorize and prioritize risks, as some risks may have a severe impact on project objectives but only happen on rare occasions, while others have a moderate impact but occur more frequently. All organization activities involve risks. Risks are events caused by uncertainties, which can have a positive or negative effect on the project objectives. All projects are unique, and thus, the associated risk varies between projects.

The risk analysis is a two-stage assessment process. Initially, qualitative methods are used to examine, categorize, and determine the main identified risk events, which are relevant for a more detailed quantitative assessment. In risk analysis, risk is traditionally defined as a function of probability and impact.

The probability is the likelihood of an event occurring and the consequences, to which extent the project is affected by an event, are the risk impacts. The probability and impact scales for the intranet development project are generated by general definitions provided by the project manager and team.

Chart 31 presents the probability scales of the intranet development project.

**Project procurement management:** It involves acquiring or procuring goods and services for a project from outside the performing organization.

**Project stakeholder management:** It focuses on identifying project stakeholders, understanding their needs and expectations, and engaging them appropriately throughout the project.

The Economic Division does not have any idea about how to apply the knowledge areas. The FPG will help bring focus and full clarity about them. They are very relevant to the realization of the project objectives.

# 3 METHODOLOGICAL FRAMEWORK

## 3.1 Information Sources

An information source is a source of information for somebody, i.e., anything that might inform a person about something or provide knowledge to somebody. Information sources may be observations, people speeches, documents, pictures, organizations, etc. (Library & Information Science Network, paragraph 2).

Different epistemologies have diverse views regarding the importance of the various kinds of information sources. Empiricism regards sense data as the ultimate information sources, while other epistemologies have different views (Kragh,1989). The various types of information sources can be divided into two broad categories: documentary sources and non-documentary sources.

A) **Documentary sources** are generally published or recorded knowledge documents.

B) **Non-Documentary sources** form a substantial part of communication, especially in science and technology. User's studies have underlined the importance of such sources. These sources provide information that other sources do not. Figure 7 shows the types of information sources.

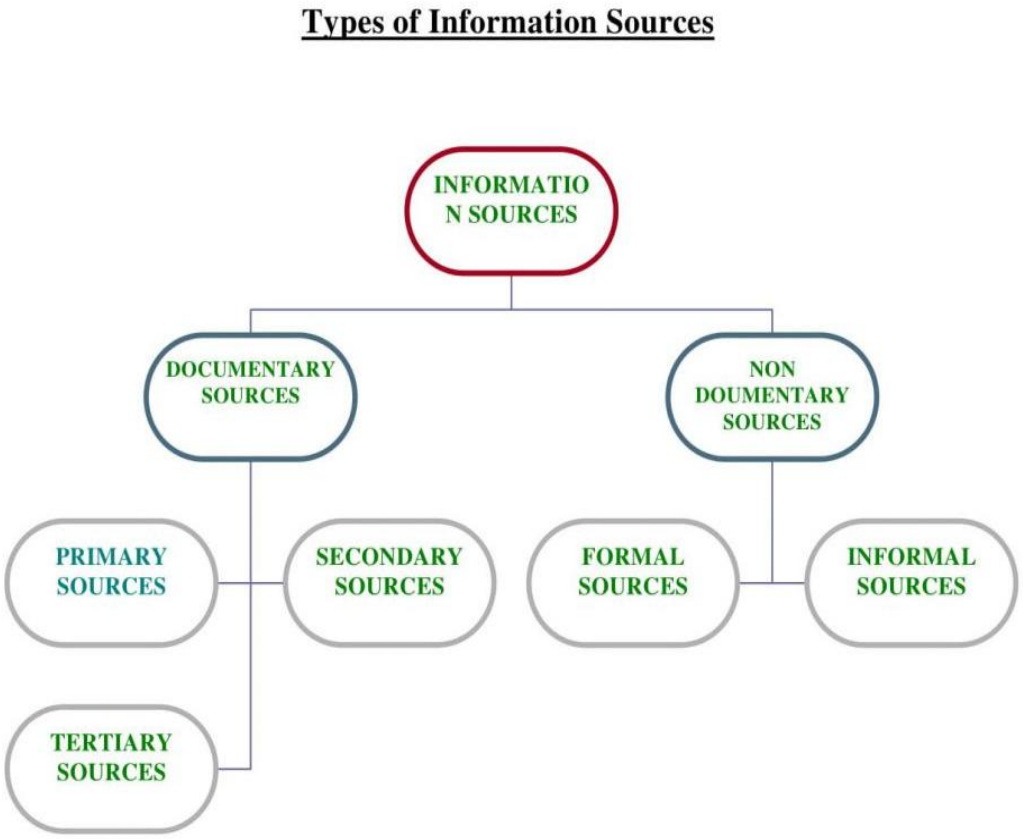



**Figure 6 : Types of Information Sources**
**(Source : Reprinted from Sanjana A. (2020) Information Sources CHAPTER – 2 Information Sources, Academia. https://www.academia.edu/35631470)**

### 3.1.1 Primary Sources

Primary sources are the original documents of an event or discovery, such as the results of a research, experiments or surveys, interviews, letters, diaries, legal documents, and scientific journal articles. Primary sources are also recordings of events as they are first described (University of Michigan-Flint, 2020, paragraph 6).

Primary source is a term used in several disciplines to describe source material that is closest to the person, information, period, or idea being studied (Library& Information Science Network, paragraph 1.1).

In historiography, a primary source (also called original source) is an artifact, document, recording, or other source of information that was created at the

time under study. If it was created by a human source, then a source with direct personal knowledge of the events was being described.

In journalism, a primary source can be a person with direct knowledge of a situation or a document created by such a person.

Primary sources can be videotapes, audio recordings or eyewitness news reports, books, periodicals, conference papers, research monographs, patents, standards, web sites, speeches, memorandums, interviews, etc.

The primary sources of information that will be used in this project are the following:

- Interviews

  Interviews will be conducted with the main stakeholders to understand the requirements and better define the scope of the project.
- Websites

  They will be used to better understand the nature of the products offered, the mission, vision, function, and type of organization.
- Research (statistical data)

  They will be used to better appreciate the quality, reliability, and sensitivity of the product services and results.

### 3.1.2 Secondary Sources

Secondary sources of information are those that are either compiled from or refer to primary sources of information, the original information having been casually modified, selected, or reorganized to serve a definite purpose for a group of users. Such sources contain information arranged and organized based on some definite plan. They contain organized knowledge rather than new knowledge. Information given in primary sources is made available in a more convenient form. Due to their very nature, secondary sources are more easily and widely available than primary sources. These not only provide digested information but also serve as bibliographical keys to primary sources of information. The primary sources are the first to appear, and they are

followed by secondary sources. It is difficult to find information from primary sources directly. Therefore, one should consult secondary sources in the first instance, which will lead to specific primary sources (Library & Information Science Network, paragraph 1.2).

Secondary sources might be indexes, bibliographies, indexing periodicals, abstracting periodicals, reviews, monographs, encyclopedias, dictionaries, handbooks, manuals, etc.

The secondary sources that will be used for the project are the following:

- Reference books, including dictionaries and encyclopedias
- Literature reviews and review articles (e.g., book reviews)
- Textbooks (PMI, 2017)

**Chart 1, Information Sources (Source: Gabriel Duvalsaint, the author, April 2021)**

| Objectives | Information sources | |
|---|---|---|
| | Primary | Secondary |
| To develop a project charter that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities | Meeting minutes/ Interviews will be conducted with the main sponsor, clients, representative team members, senior manager of the organization, network capacity, and security experts. Available organizational reforms report, which describes the vision and function of this division | The PMBOK® Guide, 6th Edition, PMI, Project Management Handbook, and reference books, including dictionaries and encyclopedias |
| To create a scope management plan in order to ensure that the project includes all the work required, and only the work required, to complete the project | Meeting minutes/ Interviews will be conducted with the Economic Division staff members and project beneficiaries. Research report available on the Economic Division | The PMBOK® Guide, 6th Edition, PMI, Project Management Handbook, Reference books, including dictionaries and encyclopedias, and practice standards for the work breakdown structure |

| | | |
|---|---|---|
| successfully | | |
| To develop a stakeholder management plan to identify stakeholders and develop strategies to effectively engage them | One-on-one interview with the Economic Division Staff and economic and statistic providers and questionnaires and surveys with sampled users | The PMBOK® Guide, 6th Edition, PMI,<br>Project Management Handbook, reference books, including dictionaries and encyclopedias, and the practice guide of requirement management |
| To create a schedule management plan in order to be able to track the progress of the different activities to ensure the timely completion of the intranet project | Personal interviews with the lead project manager (expert) and the practice standard for scheduling | The PMBOK® Guide, 6th Edition, PMI, Project Management Handbook, reference books, and reference works |
| To create a cost management plan to ensure that the project can be completed within the approved budget | Personal interviews with the lead project manager (expert), sponsor and budget and finance department and the practice standard for project estimating | The PMBOK® Guide, 6th Edition, PMI,<br>Project Management Handbook, and reference works |
| To develop a quality management plan to ensure that the project will satisfy the stated or implied needs for which it was undertaken | Personal interviews with the lead project manager (expert), legal and audit departments and international standard organizations | The PMBOK® Guide, 6th Edition, PMI,<br>Project Management Handbook, reference works, the practice guide of requirement management, and project quality management |
| To create a resource management plan to identify and manage materials and human resources for the | Personal interviews with the lead project manager (expert), the Economic Division staff, the human resources and logistics department, and procurement department | The PMBOK® Guide, 6th Edition; PMI;<br>Project Management Handbook; reference works;<br>Human and physical resources, |

| | | |
|---|---|---|
| successful completion of the project | | policies, and procedures; human and physical resources, surveys, and register; and project manager development capacity framework |
| To develop a communication management plan to ensure the timely and effective communication of the project performance and other key information | E-meetings and face-to-face interviews with the lead project manager (expert), the Economic Division staff, communication unit, and data producers | The PMBOK® Guide, 6th Edition, PMI, Project Management Handbook, reference works, and standardized guidelines for information and communication |
| To develop a risk management plan to identify and prioritize risks in the project and develop a risk response plan | Personal interviews with the lead project manager (expert), senior manager staff, sponsor, the Economic Division, users, regulators, etc. | The PMBOK® Guide, 6th Edition, PMI, Project Management Handbook, reference works, and practice standard for project risk management |

### 3.2 Research Methods

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge". Redman and Mory (1923) define research as a "systematized effort to gain new knowledge". Some people consider research as a movement, a movement from the known to the unknown. It is a voyage of discovery. We all possess the vital instinct of inquisitiveness for when the unknown confronts us; we wonder, and our inquisitiveness makes us probe and attain full and fuller understanding of the unknown. This inquisitiveness is the mother of all knowledge,

and the method, which man employs for obtaining the knowledge of whatever the unknown is, can be termed as research (Research Methodology, Second Revised Edition, page 1).

The basic types of research are as follows:

(i) Descriptive vs. analytical

(ii) Applied vs. fundamental

(iii) Quantitative vs. qualitative

(iv) Conceptual vs. empirical

(v) Other types, such as:

- Field-Setting research, laboratory research, or simulation research
- Clinical or diagnostic research
- Historical research
- Conclusion-Oriented and decision-oriented

**Descriptive vs. Analytical**

Descriptive research includes different kinds of surveys and fact-finding enquiries. The major purpose of descriptive research is the description of the situation as it exists at present.

In analytical research, on the other hand, the researcher must use facts or information that is already available and analyze it to make a critical evaluation of the material.

**Applied vs. Fundamental**

Applied research aims to find a solution for an immediate problem facing a society or an industrial/business organization, whereas fundamental research is mainly concerned with generalizations and the formulation of a theory.

**Quantitative vs. Qualitative**

Quantitative research is based on the measurement of a quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity.

Qualitative research, on the other hand, is concerned with qualitative phenomena, i.e., phenomena relating to or involving quality or kind.

**Conceptual vs. Empirical**

Conceptual research is related to abstract ideas or theories. It is generally used by philosophers and thinkers to develop new concepts or reinterpret existing ones. On the other hand, empirical research relies on experience or observation alone, often without due regard for a system and theory. It is data-based research, coming up with conclusions that are capable of being verified by observation or experiments.

At this juncture, it seems appropriate to explain the difference between research methods and research methodology. Research methods may be understood as all those methods/techniques that are used to carry out research. Research methods or techniques refer to the methods that researchers use in performing research operations.

For the final graduation project, two types of research will be used for the specific objectives:

1- The analytical method classified as library research, which contains the analysis of historical records and documents
2- Field research, which regroups non-participants' direct observations, participants' observations, mass observations, mail questionnaires, personnel interviews, focused and group interviews, and telephone surveys

**Chart 2, Research Methods (Source: Gabriel Duvalsaint, the author, April 2021)**

| **Objectives** | **Research methods** | | |
|---|---|---|---|
| | **Analytical method** | **Observation** | **Quantitative/ Qualitative** |
| To develop a project charter that formally authorizes the | This method will use the facts and information from the sources | This research applies to the project charter, as it ensures a common | Qualitative research will be applied to activities related to the business case, project |

| | | | |
|---|---|---|---|
| existence of a project and provides the project manager with the authority to apply organizational resources to project activities | identified in Chart 1, objective 1, page 21, to analyze the direct link between the project and the strategic objectives of the organization when creating the project charter. | understanding by the stakeholders of the key deliverables, milestones, and roles and responsibilities of everyone involved in the project. | success criteria, resource pre-assignment, and measurable project objectives. |
| To create a scope management plan in order to ensure that the project includes all the work required, and only the work required, to complete the project successfully | Historical information will be used in scope planning, as it entails critical thinking to be applied, undertaking all the work required, and only the work required, to complete the project. | This research applies to scope management, as it ensures that all processes are included in the project. | Qualitative research will be applied to the activities related to the work breakdown structure, work breakdown structure dictionary, deliverables, collecting requirements, and defining the scope. |
| To develop a stakeholder management plan to identify stakeholders and develop strategies to effectively engage them | This method will be used, as it entails critical thinking and information when communicating to stakeholders. | This research applies to stakeholder management to track the ongoing behavior of the project stakeholders. | Academic research and qualitative analysis will be applied in the process of identification, prioritization, and engagement of stakeholders. |
| To create a schedule management plan in order to be able to track the progress of the different activities to ensure the timely completion of the | The analytical method will be utilized using the facts and information from the sources identified in Chart 1, objective 2, page 21, to guide the decision making when creating the | The observation /interview will be applied to project time management to gather data related to the schedule/time and to ensure the process includes all required | Quantitative research related to schedule estimates will be applied to activities described in the schedule management. |

| | | | |
|---|---|---|---|
| intranet project | time/schedule management plan. | elements. | |
| To create a cost management plan to ensure that the project can be completed within the approved budget | This method will be used, as it entails critical thinking and information to ensure that the processes and their associated tools and techniques are documented in the cost management plan. | This research will be applied to project cost management as the cost observation and monitoring is applied. | Quantitative research related to cost estimates will be applied to the activities described in the scope management plan. |
| To develop a quality management plan to ensure that the project will satisfy the stated or implied needs for which it was undertaken | The analysis of historical records and documents will be used, as it entails critical thinking to be applied when adding quality processes to the project. | This research applies to quality management, since at a point in time, the observer intervenes in the environment that he would have observed to correct any processes that are not in compliance with the stakeholders' requirements. | Quantitative and qualitative research will be applied to the related activities to identify and prioritize customer requirements. |
| To create a resource management plan to identify and manage materials and human resources for the successful completion of the project | This method will be used, as it entails critical thinking for acquiring additional resources of which staff. | The non-participants' direct observation applies to human resources and tracks the ongoing behavior of project team members. | Quantitative research will be applied to activities related to estimating and acquiring resources. |
| To develop a communication management plan to | The analytical method will be utilized using the facts and information from the | This research applies to communication management, observing | Qualitative research will be applied to develop an appropriate approach and plan |

| | | | |
|---|---|---|---|
| ensure the timely and effective communication of the project performance and other key information | sources identified in Chart 1, objective 6, page 23, to guide the decision making when creating the communication management plan. | and tracking the communication flow throughout the project. | for project communication activities. |
| To develop a risk management plan to identify and prioritize risks in the project and develop a risk response plan | This method will be used in risk management, as it entails critical thinking to be applied when planning and defining risk response strategies. | This type of research applies to risk management, identifying and monitoring the risks throughout the project. | The quantitative and qualitative methods apply to risk management, as they observe and track the probability and impact of risks on the project. |
| To develop a procurement management plan to purchase products and services needed from outside the project team | This method will be used, as it entails critical thinking to be applied when purchasing and acquiring products or services outside the project team. | This research applies to procurement to observe and track the purchase of items for the project. | Qualitative research will be applied to activities related to purchasing and acquiring products, services, and results needed from outside the project team. |

### 3.3 Tools

The definition of tool may vary depending on the area where the research will be conducted. A tool is something tangible, such as a template or software program, used in performing an activity to produce a product or result (PMI ,2017, p 725). Project management tools are assets that assist an individual or team to effectively organize work and manage projects and tasks. The chart below summarizes the tools that will be used on the FGP.

**Chart 3, Tools (Source: Gabriel Duvalsaint, the author, April 2021)**

| Objectives | Tools |
|---|---|

| | |
|---|---|
| To develop a project charter that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities | 1. Project charter template<br>2. Project management plan template |
| To formally authorize the existence of a project and provide the project manager with the authority to apply organizational resources to project activities by creating a scope management plan | 1.Requirement traceability matrix template<br>2.Requirement documentation template<br>3. Scope management plan template<br>4. Requirement management plan<br>5. Work breakdown structure generator<br>6. Work breakdown structure dictionary template |
| To develop a stakeholder management plan to identify stakeholders and develop strategies to effectively engage them | 1. Stakeholder management matrix<br>2. Stakeholder analysis chart in Microsoft Excel 2016<br>3. Stakeholder register matrix<br>4. Stakeholder engagement assessment matrix<br>5. Stakeholder power/interest grid in Microsoft Excel |
| To manage the timely completion of the intranet project by developing a schedule management plan | 1-Expert judgment<br>2-Data analysis<br>• Alternative analysis<br>• Reserve analysis<br>• Schedule network analysis<br>3-Decomposition<br>4-Precedence diagramming method<br>5-Dependency determination and integration<br>6-Leads and lags<br>7-Project management information system<br>8- Three-point estimating |

| | |
|---|---|
| | 9-Critical path method<br>10-Schedule compression<br>11-Resource optimization<br>12-Performance reviews<br>13-Meetings |
| To create a cost management plan to ensure that the project can be completed within the approved budget | 1-Expert judgment<br>2-Data analysis<br>• Alternative analysis<br>• Reserve analysis<br>3-Bottom-up estimating<br>4-Project management information system<br>5-Cost aggregation<br>6-Funding limit reconciliation<br>7-Earned value analysis<br>8- Performance reviews |
| To develop a quality management plan to ensure that the project will satisfy the stated or implied needs for which it was undertaken | 1-Expert judgment<br>2- L-Shape matrix<br>3-Customer weighted prioritization matrix<br>4-Roles and responsibilities chart<br>5-Metrics and quality baseline<br>6- Quality activities matrix<br>7- Check sheets for collecting data<br>8-Flow chart<br>9- Test and inspection planning<br>10- Burn/Control chart<br>11-Audits |
| To create a resource management plan to identify and manage materials and human resources for the successful completion of the project | 1-Expert judgment<br>2-Responsibility assignment matrix<br>3-Resource breakdown structure<br>4-Project organizational chart<br>5-Resource histogram<br>6-Performance reviews<br>7-Training |

| | |
|---|---|
| | 8- Individual and team assessments<br>9- Project management information system<br>10-Work performance reports |
| To develop a communication management plan to ensure the timely and effective communication of the project performance and other key information | 1- Expert judgment<br>2- Project team directory<br>3-Project management information system (PMIS)<br>4-Communication matrix<br>5-Communication flow chart<br>6-Escalation matrix<br>7- Project reporting template |
| To develop a risk management plan to identify and prioritize risks in the project and develop a risk response plan | 1-Expert judgment<br>2-Risk breakdown structure<br>3-Risk and impact scales<br>4-Probability and impact matrix<br>5-Risk register |
| To develop a procurement management plan to purchase products and services needed from outside the project team | 1- Expert judgment<br>2-Market research<br>3- Make-or-buy analysis<br>4-Proposal evaluation template<br>5-Procurement metrics template |

### 3.4 Assumptions and Constraints

An assumption can be a factor in the planning process that is true, real, or certain, without proof or demonstration result (PMI, 2017, p 699).

Assumptions affect all aspects of project planning and are part of the progressive elaboration of the project. Project teams frequently identify, document, and validate assumptions as part of their planning process. Assumptions generally involve a

degree of risk. Assumptions are used as tools and techniques to identify risks to the project from the inaccuracy, instability, inconsistency, or incompleteness of the assumptions. Assumptions are often incorporated in the scope baseline and project estimates. Project management best practices recommend that the project manager periodically check the stability of assumptions. It is a very important step.

A constraint is a limiting factor that affects the execution of a project, program, portfolio, or process (PMI, 2017, p 701).

**Chart 4, Assumptions and Constraints (Source: Gabriel Duvalsaint, the author, April 2021)**

| Objectives | Assumptions | Constraints |
|---|---|---|
| To develop a project charter that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities | All information and support will be provided by the UCI and the team to create the project charter. | Limited time to create the project charter |
| To formally authorize the existence of a project and provide the project manager with the authority to apply organizational resources to project activities by creating a scope management plan | All required information to develop the scope of the project will be disclosed by the relevant people.<br>The scope management plan identifies all required work. | The scope may change as the project progresses. |

| Objectives | Assumptions | Constraints |
|---|---|---|
| To develop a stakeholder management plan to identify stakeholders and develop strategies to effectively engage them | The stakeholder management list will contain the main stakeholders involved and plan how to properly manage the requirements.<br><br>Full collaboration of the UCI and closed cooperation with the stakeholders to complete project | The main stakeholders are not correctly identified in the start of the project.<br><br>The stakeholders' requirements and level of interest may vary during the project. |

| Objectives | Assumptions | Constraints |
|---|---|---|
| To manage the timely completion of the intranet project by developing a schedule management plan | The time allocated for the development of the project management plan for the intranet development project is sufficient.<br><br>All goods and services will be procured on time. | The disbursement for the project execution is made on time.<br><br>Delays in government processes may impede the project progress.<br><br>Political turmoil may impact the project progress. |

| Objectives | Assumptions | Constraints |
|---|---|---|
| To create a cost management plan to ensure that the project can be completed within the approved budget | The budget created during planning will accurately depict the financial resources required to develop the intranet project. | Not enough information on cost and resources is available to complete a detailed budget.<br><br>Not enough money is budgeted for the reserve management. |
| To develop a quality management plan to ensure that the project will satisfy the stated or implied needs for which it was undertaken | All stakeholder requirements will be collected, analyzed, and prioritized.<br><br>The quality management plan will identify all technical and managerial quality requirements of the project. | Stakeholders' requirements may change as the project progresses.<br>Requirements not specified correctly<br>International standards not being available |
| To create a resource management plan to identify and manage materials and human resources for the successful completion of the project | The organization has enough human and physical resources to complete the project.<br>All academic resources will be provided by the UCI. | Some resources may not be locally available.<br><br>Difficulties to have access to UCI resources. |

| Objectives | Assumptions | Constraints |
|---|---|---|
| To develop a communication management plan to ensure the timely and effective communication of the project performance and other key information | The organization has the technology required to meet the communication needs of all stakeholders.<br>The information communicated during this planning process will be adequately comprehended, translated, and acted upon by stakeholders. | Some communication methods may not be available.<br>Communication infrastructure is inadequate for collecting and disseminating information to different stakeholders. |
| To develop a risk management plan to identify and prioritize risks in the project and develop a risk response plan | There is enough information available to adequately identify most individual and general project risks and non-event risks. | Not all risks were identified at the beginning of project.<br><br>Additional risks may occur because of other constraints. |
| To develop a procurement management plan to purchase products and services needed from outside the project team | All goods and services will be procured according to the established procurement process.<br>The procurement process will comply with the principles of public procurement. | Some suppliers may not have the required goods locally available.<br>The use of international suppliers should not cause schedule delays. |

### 3.5 Deliverables

A deliverable is any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project (PMI, 2017 p 704).

A deliverable is a tangible or intangible good or service produced as a result of a project that is intended to be delivered to a customer (either internal or external). A deliverable could be a report, document, software product, server upgrade, or any other building block of an overall project.

A deliverable differs from a project milestone in that a milestone is a measurement of progress toward an output, whereas a deliverable is the output delivered to a customer or sponsor. For a typical project, a milestone might be the completion of a product design, while the deliverable might be the technical diagram or detailed design report of the product.

In technical projects, deliverables can be further classified as hardware, software, or design documents. In contracted efforts, a deliverable may refer to an item specifically required by contract documents, such as an item on a contract data requirement list or mentioned in the work statement.

**Chart 5, Deliverables (Source: Gabriel Duvalsaint, the author, April 2021)**

| Objectives | Deliverables |
|---|---|
| To develop a project charter that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities | Project charter |
| To formally authorize the existence of a project and provide the project manager with the authority to apply organizational resources to project activities by creating a scope management plan | Scope management plan<br>Requirement management plan<br>Requirement traceability matrix |
| To develop a stakeholder management plan to identify stakeholders and develop strategies to effectively engage them | Stakeholder management plan Stakeholder management matrix Stakeholder register |
| To manage the timely completion of the intranet project by developing a schedule management plan | Schedule management plan<br>Project schedule network diagrams<br>Schedule in the Gantt chart |
| To create a cost management plan to ensure that the project can be completed within the approved budget | Cost management plan<br>Cost estimates<br>Project budget |
| To develop a quality management plan to ensure that the project will satisfy the stated or implied needs for which it was undertaken | Quality management plan |
| To create a resource management plan to identify and manage materials and human resources for the successful completion of the project | Resource management plan |
| To develop a communication | Communication management plan |

| | |
|---|---|
| management plan to ensure the timely and effective communication of the project performance and other key information | Communication matrix |
| To develop a risk management plan to identify and prioritize risks in the project and develop a risk response plan | Risk management plan<br>Risk register |
| To develop a procurement management plan to purchase products and services needed from outside the project team | Procurement management plan |

# 4 RESULTS

## 4.1. Project Charter

### 4.1.1 Introduction

The project charter is the first objective for the development of the project management plan for the development of the intranet project for the Economic Division within the Ministry of Economy and Finances as well as the first process in the project integration management knowledge area. This project charter will be accomplished using interviews, meeting minutes, the organizational reform report, and a template from the PMBOK® Guide, 6th Edition.

The project charter consists of the project's purpose, objectives, description, high level risks, stakeholder list, high-level requirements, assumptions and constraints, identification of deliverables, a summary milestone schedule, the overall project budget, criteria necessary for the project approval, the identification of the project manager, and the sponsor's authorization (PMI, 2017, page 81).

A template from the UCI scope management course will be used as a tool to develop the project charter that formally authorized the project and provided the project manager with the authority to apply organizational resources to the project to produce the project management plan.

Since the Economic Division did not have a developed project management approach to deliver the development of the intranet project, due to the fact that there were no organizational process assets (OPA), and due to the lack of a formal project management team or project management office (PMO), the assistant project manager would be the only person responsible for the development of the project management plan.

### 4.1.2 Background

Since its existence, the Economic Division continues using Microsoft Excel as a means to save, store, and distribute economic and financial data within the ministry. The need for this project arises from technological reasons. The Economic Division faces a problem of reliability, quality, availability, accessibility, and lost data. Also, as the amount of data becomes large enough, the need to

conceive and develop a database to store data appears very urgent. In the third quarter of 2020, the Ministry of Economy and Finance sent a financing request to the World Bank for the project of the development of an intranet that reacts positively by asking for the development of a project management plan for this project.

### 4.1.3 Overview

#### 4.1.3.1 Project Title:

Project Management Plan for the Development of an Intranet Project for the Economic Division in the Ministry of Economy and Finance

#### 4.1.3.2 Project Description

The project management plan for the development of an intranet project for the Economic Division in the Ministry of Economy and Finance aims to build the capacity of the Ministry of Economy and Finance. The Economic Division will be the only department that collects, treats, analyzes, stores, and distributes economic and financial data within the ministry. The project will have a consolidated database to manage statistical data, which is largely saved in Excel files. To secure the information system, an application will be developed to allow authenticated users to selectively manipulate the database (according to their previously defined access rights). To centralize the access to data and publications, an intranet will be created for the Economic Division and other departments of this ministry. It will be a three-month project, which started on February 15, 2021, and the intranet project will be opened on June 15, 2021.

#### 4.1.3.3 Pre-Assigned Resources

**Location**

The ministry will allocate a dedicated room for the project to ensure good monitoring and control on the project and a better understanding and interaction between the project team and the software development company. This area is

one important resource and must be pre-assigned before further planning the intranet development project.

**Human Resources**

The software development company will need to secure an experienced software engineer and a software development team to conceive and develop the main components of the project. An internal dedicated team will be pre-assigned for the project not only to participate in the product design but also to test and validate the developed tools.

**Information Technology Infrastructure**

Equipment and materials related to information technology need to be available to the project team. This is the most critical resource and must be pre-assigned before imitating the project.

### 4.1.3.4 Project Objectives

**Chart 6, Project Objectives (Source: Gabriel Duvalsaint, the author, April 2021)**

| General objective | Specific objectives | Timeline |
|---|---|---|
| To create a project management plan using the practice standards and frameworks of the Project Management Institute (PMI) for an intranet development project for the Economic Division of the Ministry of Economy and Finance in order to collect, analyze, manage, store, and publish economic and financial data in their website | To design a consolidated database to manage economic and financial data, which is largely stored and saved in Excel and comma separated virgule (csv) formats. | 8 weeks |
| | To create an application that allows authenticated users to selectively manipulate the centralized database to secure the information system | 3 weeks |
| | To develop an intranet system to centralize the access to data and publications from the Economic Division | 5 weeks |

#### 4.1.3.5 Project Risks and Constraints

**Risks:**

**Political/ Government Change**

Haiti is a democratic country, and as such, it changes its president and government members at elections. The project will be at risk if the new minister of economy and finances decides to review the project. The project will be at risk, as the new minister may cancel or make changes to the project despite the prior approval and contract signed by the previous project. Change in an important stakeholder such as the government is a great risk to the project.

**Political/ Social Unrest**

Haiti continuously faces social unrest and political trouble. The project will be at risk if the project team and development team cannot have access to roads and experience difficulties to meet and discuss potential changes and reviews.

**Health and Safety Impact**

Due to COVID-19, the project will be at risk if one of the project team players is tested positive and this forces all others to remain in quarantine. The project may be delayed. Change in the schedule is a great risk for the project.

**Constraints:**

**Funding/ Sponsorship Limitation**

No project has an unlimited budget. Each project management team must operate within an agreed budget. In the case of the intranet development, a major constraint would be working with a limited budget. The project involves developing three important components in a fragile environment. This may lead to many surprises and additional expenses.

**Cooperation Limitation**

The intranet development project will be developed in collaboration with the internal department and international partners. The success and smooth execution of the project relies heavily on the cooperation and acceptance of these stakeholders. A lack of collaboration could be a huge risk for the project.

**Limited Internet Connection**

The intranet development project will need a high-speed internet connection to develop a prototype and also to test and validate different components of the product. A weak internet connection can delay the project and generate additional expenses.

### 4.1.3.6 Project Stakeholders

**Chart 7, Project Stakeholders (Source: Gabriel Duvalsaint, the author, April 2021)**

| Name | Organization | Job title | Responsibility and authority |
|---|---|---|---|
| **Javier Rodrigo** | World Bank | Program coordinator | Participation in the intranet development project process by providing information and financial support. High level authority. |
| **Patrick Brutus** | Ministry of Economy and Finances | Minister | Allocating funds to the intranet development project. Developing project operation regulations, policies, and protocols. Providing his signature for the approvals of the necessary documents. High level of authority. |
| **Gabriel Santini** | Economic Division | Project manager | Providing information, organizational process assets, and |

| | | | |
|---|---|---|---|
| | | | all necessary documents to organize and plan the project. Providing guidance and advice to the board of the minister of economy and finance. Medium level authority |
| **Lys Pierre** | LPJ Software Development Inc. | Software engineer | Designing, organizing, planning, and developing the intranet project. Providing the budget and technical specification of materials and equipment necessary to plan and manage the project. Providing advice and guidance to the local project team coordinator. Medium level of authority. |
| **Maarten Vincent** | International technical partners: The European Union and Inter-American Development Bank | Representative | Providing technical assistance and expertise in designing and planning the intranet project development.<br><br>Providing advice to the local project team coordinator and World Bank program coordinator.<br><br>Low level of authority |
| **Frantz Lesage** | Economic, financial, and statistical community | Representative | Participating in the planning and development of the intranet module by providing advice and guidance on the prototype, testing process, etc. Low level of authority |

#### 4.1.3.7 Project/Product Deliverables

The specific deliverables of the product are the following:

- Requirement specification (document)
- Database modeling document
- Document of the manipulation interface conception and implementation from the consolidated database
- Preparation of the manual of use and technical manual for the interface management of the consolidated database
- Document of the intranet conception and implementation
- Preparation of the manual of use and technical manual for the intranet
- Hardware and software proposal for the technical infrastructure of the intranet development project

The results of the project are the following:

- The consolidated database contains economic and finance data from the Economic Division and other local and international entities.

- The application is created, and access rights are defined and distributed to authenticated users to selectively manage the database.

- The intranet is fully functional, and the access to data and publications is protected and centralized.

### 4.1.3.8 Summary of Project Milestones

**Chart 8, Summary of Project Milestones (Source: Gabriel Duvalsaint, the author, April 2021)**

| Milestones | Due Date | Who's responsible |
|---|---|---|
| Project initiation/kick off | 02/15/2021 | Project Sponsor, project steering committee, project manager |
| Data collection and transmission | 02/23/2021 | Economic Division, Software development company |
| Database modeling document | 03/10/2021 | Software development company |
| Validation database modeling document | 03/18/2021 | Project steering committee, project manager |
| Implementation of the consolidated database | 03/26/2021 | Software development company |
| Conception and implementation of the manipulation interface from the consolidated database document | 04/12//2021 | Software development company |
| Test for the manipulation interface of the consolidated database | 04/20/2021 | Software development company, project manager, Economic Division |

| | | |
|---|---|---|
| Preparation of the manual of use and technical manual for the interface management of the consolidated database | 04/28/2021 | Software development company |
| Document of the intranet conception and implementation | 05/20/2021 | Software development company |
| Intranet acceptance test by the users | 05/28/2021 | Software development company, project manager, Economic Division |
| Preparation of the manual of use and technical manual for the intranet | 06/07/2021 | Software development company |
| Final validation of the project | 05/15/2021 | Project Sponsor, project steering committee, project manager |

#### 4.1.3.9 Assumptions

- **Scope:** Other features will not be added to the project, which can considerably change the project scope during the execution of project.
- **Financing:** The project will receive sufficient financial support during the execution to procure all equipment, software, and materials needed to effectively develop the intranet project development.
- **Human resources:** The project will be equipped with sufficient experienced staff and skilled workers, and they will not move to another project.
- **Planning:** Sponsors will approve the components of the intranet development project as indicated in the design and schedule.

- **Schedule:** The project will be substantially completed in sixteen weeks with additional weeks for allocating for the remaining work.

### 4.2. Scope Management Plan

Project scope management involves defining and controlling what work is or is not included in a project. The main planning processes performed as part of project scope management include planning scope management, collecting requirements, defining scope, and creating the WBS. The main documents that are produced are requirement documents, a requirement management plan, a requirement traceability matrix, and a scope baseline, which is composed of an approved scope statement, a WBS, and a WBS dictionary (Kathy Schwalbe (2017). *An Introduction to Project Management, 4th Edition*, Schwalbe, p 213).

#### 4.2.1. Scope Management Approach

As none of the departments of the Ministry of Economy and Finance have expertise in planning projects and since the ministry does not have organizational process assets, such as policies and procedures and historical information, the project manager and team will have the responsibility to develop the scope management plan. The scope management plan of this project will contain the project scope statement; work breakdown structure (WBS); WBS dictionary, also known as the scope verification matrix; and a requirement traceability matrix as an output of the collecting requirement process.

The project scope will be validated by the sponsor, project manager, and stakeholders by formally signing off and approving deliverables that meet the acceptance criteria and documenting deliverables that have not been accepted as components of the work performance information.

The project life cycle adopted for the intranet development project will be predictive; that means project deliverables are defined at the beginning of the project, and any changes to the scope are progressively managed.

All change requests related to the scope will be submitted to the project manager, who will then evaluate the requested scope change. Upon acceptance of the scope change request, the project manager will submit the scope change request to the

change control board and project sponsor for acceptance. Based on feedback and input from the project manager and stakeholders, the project sponsor is responsible for the acceptance of the final project deliverables and project scope. This scope management plan will be accomplished using meeting minutes, expert judgment provided by the sponsor, and a template from the PMBOK® Guide, 6th Edition and PMI Practice Standard for Work Breakdown Structure, 2nd Edition.

### 4.2.2 Roles and Responsibilities

Managing the scope of a project is an important step in project management. It should be clearly coordinated to ensure the success of the project. The project manager, sponsor, and team will all play key roles in managing the scope of this project. They must be aware of their various responsibilities to ensure that the work done is within the established scope throughout the project lifecycle. The table below defines the roles and responsibilities for the scope management of the intranet development project.

**Chart 9, Scope Management Roles & Responsibilities (Source: Gabriel Duvalsaint, the author, April 2021)**

| Name | Role | Responsibilities |
|---|---|---|
| **Javier Rodrigo** | Project sponsor | 1.To approve or deny scope change requests as it is appropriate<br>2.To evaluate the need for scope change requests<br>3.To accept project deliverables |
| **Gabriel Santini** | Project manager | 1. To measure and verify the project scope<br>2. To facilitate scope change requests<br>3. To facilitate impact assessments of scope change requests<br>4. To organize and facilitate scheduled change control meetings<br>5. To communicate the outcomes of scope change requests<br>6. To update project documents upon the approval of all scope changes |

| | | |
|---|---|---|
| **Economic Division** | Project team members | 1.To propose scope and schedule changes for approval<br>2.To take part in the definition of the project's scope<br>3. To evaluate the need for scope changes and communicate them to the project manager as it is necessary |
| **Lys Pierre** | Project development team | 1.To evaluate the feasibility of project scope changes<br>2. To execute change directives issued by the project manager |
| **Users, International partners, and the Scientific community** | Other stakeholders | They can propose scope changes. |

### 4.2.3. Project Scope Statement

As an output of the process of defining the scope, the project scope statement is the description of the project scope, major deliverables, and exclusions. The project scope statement documents the entire scope, including the project and product scope. It also provides a common understanding of the project scope among project stakeholders. It enables the project team to perform more detailed planning, guides the project team's work during execution, and provides the baseline for evaluating whether requests for changes or additional work are contained within or outside the project's boundaries (PMI, 2017, p 154).

#### 4.2.3.1 Project Scope Description

The scope of this project will consist of developing an intranet that centralizes the access to various data through the following elements:

- A consolidated database that will be interconnected with other databases of other departments in the department
- Sector databases that include data from 4 sectors of the economy:

  - Monetary and financing
  - Balance of payment
  - Real sector
  - Public administration sector
- Publications of economic and financial data, administrative documents, notes, strategy papers, economic and statistic surveys, and other public documents in their website

The intranet will be developed by using the client-server 3 tier architecture. In this kind of architecture, the data is centralized on a server, and the application that contains all management rules is centralized on another server. Client computers access the application through any web browser that displays the graphical interface to interact with this application.

**Required IT Equipment**

Any computer using any operating system (Windows, Linux, Mac, etc.) can be used as a client workstation because the application will be "web based" and therefore will not require a lot of computing power from client workstations.

**Required Software**

**Chart 10, Operating System (Source: Gabriel Duvalsaint, the author, April 2021)**

| Environment | Software | Advantages | Disadvantages |
|---|---|---|---|
| Windows | Windows server 2008 /2012 | More local expertise | Owner license (paid) |
| Linux/Unix | Debian, Suse, Free BSD, etc. | Less local expertise | Free license |

**Chart 11, Database Management System (Source: Gabriel Duvalsaint, the author, April 2021)**

| Environment | Software | Advantages | Disadvantages |
|---|---|---|---|
| Windows | SQL Server 2008/2012 | More local expertise and the compatibility with Ms. Excel | Owner license (paid) |
| Windows | Database management system (MySQL, PostgreSQL, etc.) | Less local expertise | Free license |
| Linux/Unix | Database management system (MySQL, PostgreSQL, etc.) | Less local expertise | Free license |

#### 4.2.3.2 Deliverables

The deliverable for this project will be a fully functioning intranet system with the flexibility to modify and expand the application as it is necessary in the future. This project will be accepted once the new software has been successfully tested.

#### 4.2.3.3 Acceptance Criteria

The deliverable acceptance criteria are defined as a formal statement of needs, rules, tests, requirements, and standards that must be used in reviewing the project outcome and come to an agreement with the customer on the point that the project has produced the deliverables that meet the initial expectations of the customer (Deliverables Acceptance Management – Setting Criteria for Accepting Project Deliverables, paragraph 4). The PMBOK® Guide, 6th Edition, defined acceptance criteria as a set of conditions that is required to be met before deliverables are accepted. The acceptance criteria for the intranet development will be mainly test environments and acceptance tests such as the following:

The specifications required on the operating system, RAM, system type, and data files necessary for the software to run are met accordingly with the information from the deliverable requirement specification document (*test environment*).

The database contains 90% of the data from the four (4) sectors, which are saved in Ms excel, and it accepts files with different extensions, such as csv, pdf, etc. (*smoke test*).

All authorized users are able to log in to the system via the application and can access the data according to previously defined access rights (*black box testing*).

The graphic interface to interact with the application works correctly when users connect to the database (*user acceptance test*).

External users may use an internet connection to get access to the data published by the Economic Division without frequent interruption (*user acceptance test*).

#### 4.2.3.4 Project Exclusions

The project does not include any application updates and upgrades developed during the closure phase or after the project finalization.

The project does not include web content management and control.

User desktop hardware upgrades or replacements will not be part of the project.

IT security management will not be included in the project.

### 4.2.4 Collect Requirements

Collect requirements is the process of determining, documenting, and managing stakeholder needs and requirements to meet objectives. It is important to document requirements in enough detail so that they can be measured during the project execution. To collect requirements for the intranet development, the project manager and team will use interviews, focus groups, and prototypes as tools and techniques. The main output for this process will be a requirement documentation.

#### 4.2.4.1 Requirement Documentation

The requirement documentation describes how individual requirements meet the business need for the project. Requirements may start out at a high level and become progressively more detailed as more information about the requirements is known. The format of the requirement document may range from a simple document listing all of the requirements categorized by stakeholder and priority to

more elaborate forms containing an executive summary, detailed descriptions, and attachments.

Many organizations categorize requirements into different types, such as business and technical solutions, the former referring to stakeholder needs and the latter to how those needs will be implemented. The table below presents the adopted requirement documentation.

**Chart 12, Requirement Documentation (Source: Gabriel Duvalsaint, the author, April 2021)**

| Categories | Requirements | Priority level |
|---|---|---|
| Business requirements | 1- The intranet development project, which will be complied with regulatory and meet the users' needs | Medium |
| Stakeholder requirements | 1-Information should always be available for internal and external users.<br>2- Friendly interface | Medium |
| Solution requirements | 1-Highly secured intranet<br>2-Easy access to the database<br>3- Frequent website updates | Medium |
| Project requirements | Contracts for the software development company and providers | High |

### 4.2.5. Create the Work Breakdown Structure

Successful project management relies on thorough planning. This begins by defining the project objectives with sufficiently detailed information. The work breakdown structure (WBS) provides the foundation for defining work as it relates to project objectives. The WBS also establishes the framework for managing the work to its completion. Because the WBS defines the total scope of the project, work should not be done on a project if it is not included in the WBS.

Creating the WBS is the process of subdividing project deliverables and project work into smaller, more manageable components (PMI,2017 p. 156).

The lowest level of a WBS is called a work package, and each work package should be defined in enough detail to estimate what it would cost and how long it would take to create.

The WBS of the intranet development project will be created by using the technique of decomposition, expert judgment, and generic or corporate WBS templates. The generic template will be tailored and developed by the project manager with the help of the project team. Figure 7 below shows the WBS of the intranet development project.

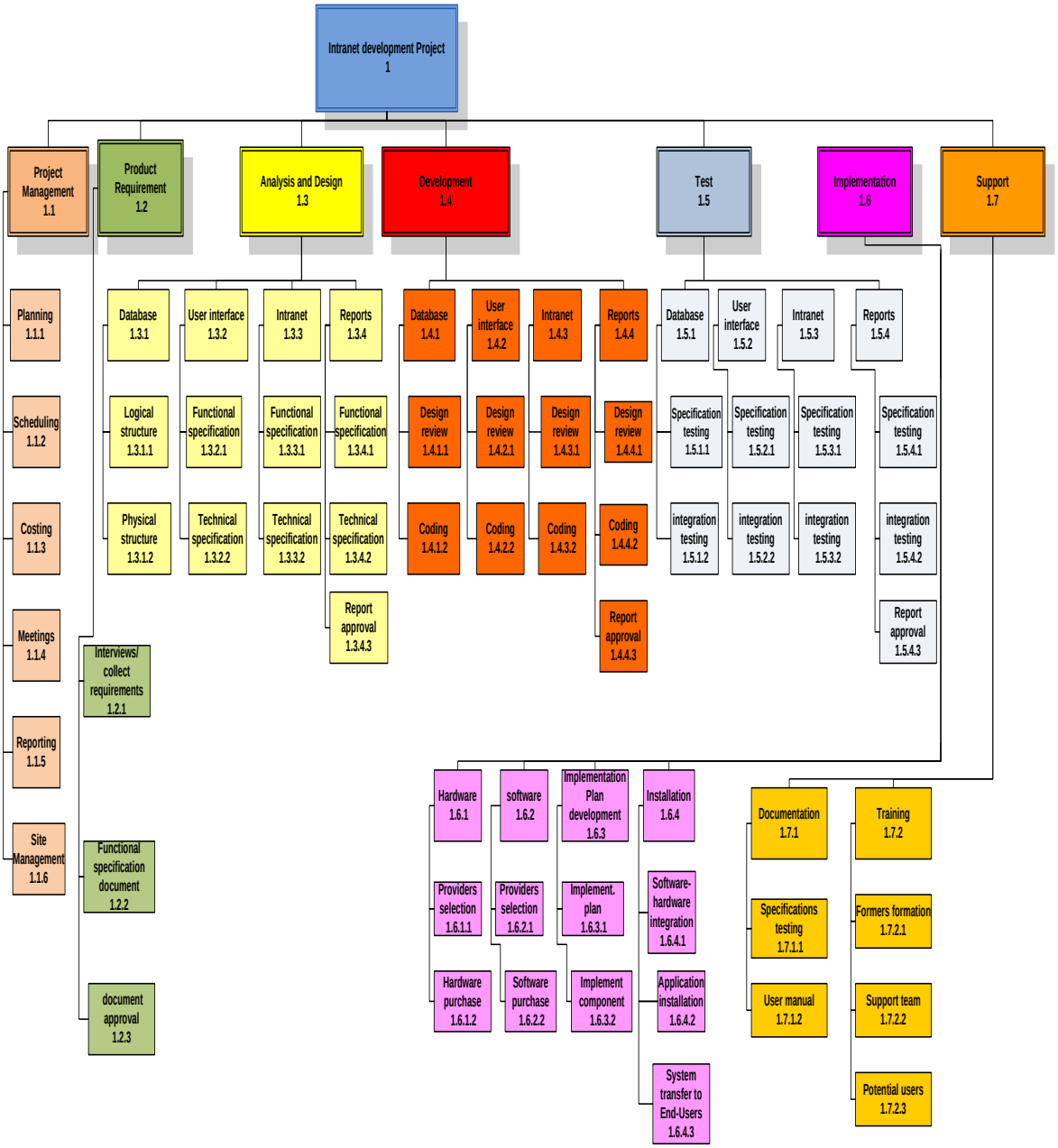



**Figure 7 : Work Breakdown Structure (Source: Gabriel Duvalsaint, the author, April 2021)**

### 4.2.6. Create the Work Breakdown Structure Dictionary

The WBS dictionary is a document that provides detailed deliverable, activity, and scheduling information about each component in the WBS. The WBS dictionary is a document that explains the contents of and serves as a user manual for the WBS. It will be updated in the later stage with information from another process.

**Chart 13, Work Breakdown Structure Dictionary (Source: Gabriel Duvalsaint, the author, April 2021)**

| Level | WBS code | Work package | Description of work | Deliverables | Resources |
|---|---|---|---|---|---|
| 1 | 1 | Intranet Development project | All component required to specify, design, test and deploy the software | | |
| 2 | 1.1 | Project management | | | |
| 2 | 1.2 | Product requirements | | | |
| 3 | 1.2.1 | Collecting requirements | A meeting to determine the project needs | Initial requirement documentation | A spreadsheet, notebook, research, survey, laptop, and the internet |
| 3 | 1.2.2 | Functional specification | Defining the current situation and providing the future description of management information system from collected requirement information | Initial functional documentation | A consultant, laptop, the internet, and MIS research |
| 3 | 1.2.3 | Document approval | The document presents the future function of the system. | Approved document | The main stakeholders, a laptop, projector, and the internet |
| 2 | 1.3 | Analysis and design | | | |
| 3 | 1.3.1.1 | Logical structure | A logical model of data that describes the table, key, attribute of the database | Logical model presentation and documentation | The project team and staff, a projector, the internet, and a laptop |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 1.3.1.2 | Physical structure | A physical and technical architecture of the database | Physical model presentation and documentation | The project team and staff, a projector, the internet, and a laptop |
| 3 | 1.3.2.1 | User interface functional specifications | Designing a user-friendly interface that is human-computer interaction prescribed | User interface functional documentation | A laptop, the internet, and software |
| 3 | 1.3.2.2 | User interface technical specifications | Defining technical specifications needed to design the user-friendly interface | User interface technical documentation | A laptop, the internet, software, and hardware |
| 3 | 1.3.3.1 | Intranet application functional specifications | Designing the intranet network with all critical and non-critical features | Intranet functional documentation | A laptop, the internet, and software |
| 3 | 1.3.3.2 | Intranet application technical specifications | Defining technical specifications, such as language, tools, and protocols, needed to design the intranet | Intranet technical documentation | A laptop, the internet, software, and hardware |
| 3 | 1.3.4.3 | Reports | A report of functional and technical specification proposals | Report approved documentation | A spreadsheet, notebook, laptop, and the internet |
| 2 | 1.4. | Development | | | |
| 3 | 1.4.1.1 | Design review | A review of the entire database structure and functional and technical specifications | Review documentation | A laptop, the internet, and social media |
| 3 | 1.4.1.2 | Coding | Creating the table and writing code for developing the database | Coding documentation | A laptop, the internet, software, and hardware |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 1.4.2.1 | Design review | A review of the functional and technical specifications of the user interface | Review documentation | A spreadsheet, notebook, laptop, the internet, and a flowchart |
| 3 | 1.4.2.2 | Coding | Writing codes for developing and presenting the user interface | Coding documentation | A laptop, the internet, software, and hardware |
| 3 | 1.4.3.1 | Design review | A review of the functional and technical specifications of the intranet | Review documentation | A spreadsheet, notebook, laptop, the internet, and a flowchart |
| 3 | 1.4.3.2 | Coding | Writing codes for developing the intranet | Coding documentation | A spreadsheet, notebook, laptop, the internet, and a flowchart |
| 3 | 1.4.3.3 | Reports | A report of the design review and coding | Report approved documentation | A spreadsheet, notebook, laptop, and the internet |
| 2 | 1.5 | Test | | | |
| 3 | 1.5.1.1 | Specification testing | Carrying out quality tests to ensure the materials, software, and hardware meet the specifications provided for the data base system | Control and verification report | A laptop, the internet website, and procurement proposal |
| 3 | 1.5.1.2 | Integration testing | Carrying out quality tests to ensure the database is working as designed | Quality assurance report | A laptop, the internet, website, and local network |
| 3 | 1.5.2.1 | Specification | Carrying out quality tests to | Control and | A laptop, |

| | | | | | |
|---|---|---|---|---|---|
| | | testing | ensure the materials, software, and hardware meet the specifications provided for the user interface | verification report | the internet, website, and procurement proposal |
| 3 | 1.5.2.2 | Integration testing | Carrying out quality tests to ensure the interface is working properly as designed | Quality assurance report | A laptop, the internet, website, and local network |
| 3 | 1.5.3.1 | Specification testing | Carrying out quality tests to ensure the materials, software, and hardware meet the specifications provided for the intranet | Control and verification report | A laptop, the internet, website, and procurement proposal |
| 3 | 1.5.3.2 | Integration testing | Carrying out quality tests to ensure the intranet is working properly as designed | Quality assurance report | A laptop, the internet, website, and local network |
| 2 | 1.6 | Implementation | | | |
| 3 | 1.6.1.1 | Providers' selection | Selecting providers according to the bid process of the procurement management plan | The request for the proposal and request for the quotation | A laptop,the internet, hardware, and specification lists |
| 3 | 1.6.1.2 | Purchased hardware | The inventory of the received hardware, servers, materials, and equipment | Inventory documentation | A spreadsheet, notebook, laptop, and the internet |
| 3 | 1.6.2.2 | Purchased software | The inventory of the software license and free received software | Inventory documentation | A spreadsheet, notebook, laptop, and the internet |
| 3 | 1.6.3.2 | Implementation components | Implementing all components of the project according to the project's description | Report documentation | A spreadsheet, notebook, laptop, and the internet |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 1.6.4.1 | Software-Hardware integration | Ensuring hardware and software features are compatible and work together as a system | Software-hardware integration report | A laptop, the internet, hardware, and software |
| 3 | 1.6.4.2 | Application installation | Installing the application according to the scope description | Application installation process documentation | A laptop, the internet, hardware, and software servers |
| 2 | 1.7 | Support | | | |
| 3 | 1.7.1.2 | User manual | Guidelines of different application components and operations | User manual documentation | A laptop and the internet |
| 3 | 1.7.2.1 | Formers' formation | Forming a pool of four (4) formers to manage the application | Formation documentation | A laptop, desktop, the internet, and a projector |
| 3 | 1.7.2.2 | Support team | Forming a support team in the ministry to handle the application in case of troubleshooting | Formation documentation | A laptop, the internet, a projector, and WIFI |
| 3 | 1.7.2.3 | Potential users | Extending the formation to potential users in different departments in the ministry | Formation documentation | A laptop, the internet, a projector, and WIFI |
| | 1.7.2.4 | Transfer to end-users | Effective transfer of the intranet to the Economic Division | Required internal documentation and clearances from the organization, new owners, and government | Computers, the internet, application, database, and intranet |

### 4.3. Project Schedule Management

Project schedule management involves the processes required to ensure the timely completion of a project. The main planning processes performed as part of project schedule management are planning schedule management, defining activities, sequencing activities, estimating activity resources, estimating activity durations, and developing the project schedule. The main documents produced are a schedule management plan, an activity list and attributes, a milestone list, a project schedule network diagram, activity resource requirements, activity duration estimates, and a project schedule (Kathy Schwalbe (2017) *Introduction to Project Management, Fourth edition*, Schwalbe, p. 241).

#### 4.3.1 Schedule Management Plan

##### 4.3.1.1 Process Description and Importance

###### 4.3.1.1.1 Schedule Development:

The intranet development project will be created using a suitable and recognized project software starting with the deliverables identified in the work breakdown structure (WBS). The activities identified under level 3 in the WBS will identify the specific tasks that must be performed to complete each deliverable. Activity sequencing will be used to determine the order of work packages and assigned relationships between the project activities. The activity duration will be used to calculate the number of work periods required to complete the work packages. Once a preliminary schedule has been developed, it will be reviewed by the project team and any other resource tentatively assigned to the project. Once a consensus has been met on the proposed work package assignments, durations, and schedule, the project sponsor will review and approve the schedule. The project manager will be responsible for developing and managing the project schedule.

##### 4.3.1.2 Tools and Techniques to be Used on the Schedule Management Plan

The purpose of this process is to determine the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule. The project team holds meetings, consults with experts, and

analyzes data to produce a schedule management plan, which becomes a component of the project management plan.

#### 4.3.1.3 Level of Accuracy

The level of accuracy specifies the acceptable range used in determining realistic activity duration estimates and may include an amount for contingencies. For this project, an acceptance range of ± 10% will be used in determining realistic duration estimates.

#### 4.3.1.4 Units of Measure

The typical unit for measuring the duration of an activity is a day. Human resource measurements are staff/day. No other fractions or portions of identified measures are used for the project.

#### 4.3.1.5 Control Thresholds

For the intranet development project, if a team member feels a schedule change is necessary, the project manager and team will meet to review and evaluate the change. The project team will determine which tasks are affected, calculate the variance, and generate a list of possible alternatives for consideration. If, after completing the evaluation, the project manager determines that any change exceeds the established thresholds or boundaries, a change request will be submitted to the project committee.

A change request is necessary if either of the following two conditions is true:

- The proposed change is estimated to increase or reduce the work package duration by 10% or more when compared against the baseline.
- The proposed change is estimated to increase or reduce the overall project duration by 10% or more when compared against the baseline.

Once the schedule change request is reviewed and approved, the project manager will record the change request result, store the documents in the project repository, modify the schedule according to the approved change, and communicate the change and impacts to the project team and stakeholders.

#### 4.3.1.6 Rule of Performance

The intranet development project will use the schedule variance and schedule performance index (SPI) as the basis for measuring schedule performance. In addition, the project will track one additional data point to improve the estimation accuracy: the percentage of tasks on time, which measures the percentage of tasks that finish on or ahead of their planned finish date.

### 4.3.2 Activity List

#### 4.3.2.1 Process Description

The activity list includes the schedule activities required on the project**.** The activity list includes an activity identifier and a work scope description for each activity in sufficient detail to ensure that project team members understand what work is required to be completed. The expert judgment and the decomposition technique will be used to define activities. The activity list will be produced sequentially, with the WBS and WBS dictionary. Each work package within the WBS is decomposed into the activities required to produce the work package deliverables. The activity list of the project will be updated periodically as the project progresses and will be presented in Chart 14.

### 4.3.3 Activity Sequencing

#### 4.3.3.1 Process Description

Sequencing activities is the process of identifying and documenting relationships among the project activities. The fundamental goal of the sequence activities process is to finalize the interrelationship of activities to finish the project scope and achieve the task objectives. For this project, a finish-to-start (FS) logical relationship will be used by the project manager and team as a precedence diagramming method (PDM) to link project activities. The project management team determines the dependencies that may require a lead or a lag to accurately define the logical relationship. The use of leads and lags should not replace the schedule logic. Also, duration estimates do not include any leads or lags. Figure 8

will display the project schedule network diagram, which is the output of this process.

### 4.3.4 Duration Estimates

#### 4.3.4.1 Process Description

Estimate activity duration is the process that involves analyzing different activities and estimating how long it will take to accomplish a certain task with an estimated amount of resources.

The estimate activity duration process is used to approximate the amount of time or work periods needed to complete project activities with the assigned resources. There are many inputs and considerations required for estimating activity durations. They include the scope of the activity, resource types and quantities, available resources, resource calendars, project scope statement, and other organizational and environmental factors.

This process estimates the amount of work required to complete an activity as well as the number of resources needed to complete the work. These estimates will be used to determine the number of work periods required for an activity to be completed. Any assumptions and supporting data must also be documented to support the estimates.

There are several tools and techniques that can be used to estimate activity durations. In this project, the three-point estimate technique combined with expert judgment will be used for activity durations. Appendix 4 will display the duration estimates of each activity.

### 4.3.5 Project Schedule and Critical Path

#### 4.3.5.1 Process Description

The project schedule is a vital tool in planning, executing, monitoring, and communicating the delivery to stakeholders. The project schedule assigns tasks to each responsible agency and ensures these are completed within the stipulated time frames in order to create a cohesive flow of project activities. The project

schedule is established to keep projects on track, set realistic time frames, assign resources appropriately, and manage quality.

Another important element is the critical path, which allows organizations to prioritize the tasks that require greater focus. Tasks falling along the critical path directly impact the ability to complete the project on time. Any delay in these types of tasks will set back the project completion date. Tasks that are not on the critical path may be delayed without affecting the final completion date of the project. For this reason, critical path tasks incur a higher priority in the use of the project's resources.

The project schedule is the output of a schedule model that presents linked activities with planned dates and durations, milestones, and resources. The project schedule is in a tabular form, but MS project will be used to deliver a graphic presentation of the project schedule. The bar charts, also known as Gantt charts, represent schedule information where the list of activities and activity durations are shown according to the start and finish dates. In the table form, we also have the milestone schedule. Milestones are activities with zero duration; they identify the scheduled start or completion of the major deliverables.

The critical path is the longest path that includes activities with zero total float. The critical path method is used to calculate the critical path(s) of the project and the amount of total and free float. The critical path method applied to the project will be based on the PERT technique. With the MS Project software, we have identified the critical path and calculated the duration of the project, which is 101 days.

**Chart 14, Project Schedule (Source: Gabriel Duvalsaint, the author, April 2021**

| **Project Schedule** | |
|---|---|
| **FULL PROJECT NAME:** | PROJECT MANAGEMENT PLAN FOR THE DEVELOPMENT OF AN INTRANET FOR THE ECONOMIC DIVISION IN THE MINISTRY OF ECONOMY AND FINANCES |
| **DATE:** | **February 2021 - April 2021** |

| ACTIVITY LIST | | | | | | |
|---|---|---|---|---|---|---|
| **WBS Code** | **ACTIVITY NAME** | **Activity ID** | **ACTIVITY DESCRIPTION** | **Milestones** | **Predecessor activity IDs** | **Duration days** |
| **1.1** | | 1.1.1 | Getting the board's approval and responsible stakeholders' agreement | | Start | |
| | | 1.1.2 | Signing of the loan agreement | | 1.1.1 | 2 |
| | | 1.1.3 | Procuring service contracts | | 1.1.2 | 5 |
| | | 1.1.4 | Hiring the software department company | | 1.1.3 | 2 |
| **1.2.1** | Collect requirements of stakeholders | 1.2.1.1 | Meeting to determine the project needs | | 1.1.4 | 4 |
| **1.2.2** | Develop the functional specification of the whole system | 1.2.2.1 | Defining the current situation and providing the future description of management information system from the collected requirement information | | 1.2.1.1 | 3 |
| **1.2.3** | Document approval | 1.2.3.1 | The document presents the future function and characteristics of the system. | **Data collection and transmission** | 1.2.2.1 | 3 |
| **1.3.1.1** | Define the logical structure of database | 1.3.1.1.1 | Logical model of data that describes the tables, keys, cardinality and attributes of the database | | 1.2.3.1 | 3 |
| **1.3.1.2** | Design physical structure of database | 1.3.1.2.1 | Defining and presenting the physical layer, access methods, storage structure, buffer, manager, storage manager, catalog of data, indices, log etc. | **Database modeling document** | 1.2.3.1 | 3 |
| **1.3.2.1** | Prepare user interface functional specifications | 1.3.2.1.1 | Designing a user-friendly interface that is prescribed for human-computer interaction | | 1.3.1.2.1 | 3 |
| | Prepare user interface technical specifications | 1.3.2.2.1 | Defining technical specifications, such as language, tools, and protocols, needed to design the intranet | **Designing a user interface documentation** | 1.3.2.1.1 | 3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **1.3.2.2** | Produce intranet application functional specifications | 1.3.3.1.1 | Designing the intranet network with all critical and non-critical features | | 1.3.2.2.1 | 3 |
| **1.3.3.1** | Produce intranet application technical specifications | 1.3.3.2.1 | Defining technical specifications, such as language, tools, and protocols, needed to design the intranet | **Designing the intranet documentation** | 1.3.3.1.1 | 3 |
| **1.3.3.2**<br><br>**1.3.4.3** | Prepare and submit Report | 1.3.4.3.1 | A report of functional and technical specification proposals | | 1.3.3.2.1 | 1 |
| **1.4.1.1** | Design review of database specifications | 1.4.1.1.1 | A review of the entire database structure and functional and technical specifications | | 1.3.3.3.1 | 1 |
| **1.4.1.2** | Coding of database management system | 1.4.1.2.1 | Creating tables and writing codes to develop the database | | 1.4.1.1.1 | 4 |
| | Design review of user interface specification | 1.4.2.1.1 | A review of the functional and technical specifications of the user interface | | 1.3.3.3.1 | 1 |
| **1.4.2.1** | Coding of user interface application | 1.4.2.2.1 | Writing scripts and codes for developing and presenting the user interface | | 1.4.2.1.1 | 4 |
| **1.4.2.2** | Design review of intranet specifications | 1.4.3.1.1 | A review of the functional and technical specifications of the intranet | | 1.3.3.3.1 | 1 |
| **1.4.3.1** | Coding for intranet software | 1.4.3.2.1 | Writing scripts and codes for developing the intranet | | 1.4.3.1.1 | 4 |
| **1.4.3.2**<br><br>**1.4.4.3** | Prepare and submit Report | 1.4.4.3.1 | A report of the design review and coding | | 1.4.3.2.1 | 1 |
| **1.5.1.1** | Select providers for hardware | 1.5.1.1.1 | Selecting providers according to the bid process of the | | 1.4.4.3.1 | 2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | procurement management plan | | | |
| **1.5.1.2** | Purchase and deliver of hardware | 1.5.1.2.1 | Procuring hardware, servers, materials, and accessories according to the specifications provided by the software development company | | 1.5.1.1.1 | 17 |
| **1.5.2.1** | Select providers for software | 1.5.2.1.1 | Selecting providers according to the bid process of the procurement management plan | | 1.4.4.3.1 | 2 |
| **1.5.2.2** | Purchase and deliver Software/license | 1.5.2.2.1 | Procuring the license free software and accessories according to the specifications provided by the software development company | | 1.5.2.1.1 | 7 |
| **1.5.3.2** | Implement all components | 1.5.3.2.1 | Implementing all components of the project according to the project's description | **Implementation of the database, user-interface, and intranet** | 1.5.2.2.1<br>1.5.1.2.1 | 3 |
| | Integrate software with hardware | 1.5.4.1.1 | Ensuring that the software, hardware, and a network of the systems works optimally and securely | | 1.5.3.2.1 | 5 |
| **1.5.4.1** | Install application | 1.5.4.2.1 | Installing the application and components according to the approved requirement documentation | | 1.5.4.1.1 | 3 |
| **1.5.4.2**<br>**1.5.4.3** | Transfer the whole system to the testing phase | 1.5.4.3.1 | Transfer of the application to the project team and specific users for testing | | 1.5.4.2.1 | 2 |
| **1.6.1.1** | Test of specification for database management system | 1.6.1.1.1 | Carrying out quality testing to ensure the materials, software, and hardware meet the specifications provided for the database system | **Testing documentation** | 1.5.4.3.1 | 2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **1.6.1.2** | Test of integration of database module | 1.6.1.2.1 | Testing the modules/components when they are integrated to verify that they work as expected | | 1.6.1.1.1 | 2 |
| **1.6.2.1** | Test of specification for user interface application | 1.6.2.1.1 | Conducting tests in accordance with the requirement specifications for the user interface application | | 1.5.4.3.1 | 2 |
| **1.6.2.2** | Test of integration for user interface application | 1.6.2.2.1 | Carrying out quality testing to ensure the materials, software, and hardware meet the specifications provided for the interface application | | 1.6.2.1.1 | 2 |
| **1.6.3.1** | Test of specification for intranet software | 1.6.3.1.1 | Conducting tests in accordance with the requirement specifications for the intranet application | | 1.5.4.3.1 | 2 |
| **1.6.3.2** | Test of integration for intranet software | 1.6.3.2.1 | Conducting tests in accordance with the requirement specifications for the intranet application | | 1.6.3.1.1 | 2 |
| **1.6.4.3** | Prepare and submit Report | 1.6.4.3.1 | Reporting the performance of the testing documentation approved by the stakeholders | **Acceptance of the user test documentation** | 1.6.3.2.1 | 1 |
| **1.7.1.1** | Prepare and submit specifications and testing manual of the whole system | 1.7.1.1.1 | Documentation to test the software application in order to identify bugs | **Manual of use and technical manual for the interface management of the consolidated database** | 1.6.4.3.1 | 3 |
| **1.7.1.2** | develop the user manual | 1.7.1.2.1 | The manual containing all essential information for the user to make full use of the information system | **Manual of use for intranet users** | 1.6.4.3.1 | 3 |
| **1.7.2.1** | Train Formers | 1.7.2.1.1 | Forming a pool of four (4) formers to train other staffs to manage the application | | 1.7.1.2.1 | 4 |
| | Build support team | | Assisting and connecting with the | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **1.7.2.2** | | 1.7.2.2.1 | whole department group to meet stakeholders' needs and expectations | | 1.7.2.1.1 | 2 |
| **1.7.2.3** | Training potential users of the system | 1.7.2.3.1 | Extending the formation to potential users in different departments in the ministry | | 1.7.2.1.1 | 5 |
| **1.7.2.4** | Transfer the system to end-users | 1.7.2.4 | Transferring the application to the final users | **Final validation of the project** | 1.7.2.3.1 | 1 |
| **1.7.2.5** | Closing | 1.7.2.5 | Project closing activities | | 1.7.2.4 | 4 |
| **1.7.2.6** | End | 1.7.2.6 | Project closure | | 1.7.2.5 | 0 |

### 4.3.6 Project Schedule in MS Project

The Microsoft Project Schedule software was used to create the project schedule. The project duration is 101 days (5 months and 1 day) and consists of 7 work packages and 43 different activities identified by a unique activity ID. Figure 8 below shows the project schedule.

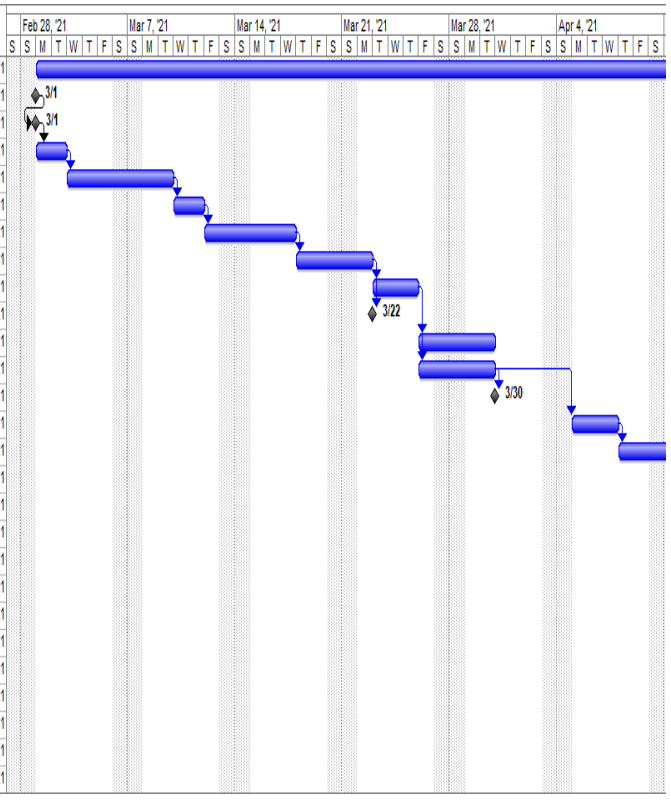
To establish the duration of the activities and create the project schedule, a work schedule of 40 hours per week was set, distributed over eight hours a day from Monday to Friday, from 8:00 a.m. to 5:00 p.m. In addition, there are 3 holidays during the project process. Here is the list:

Friday, April 2, 2019: Holy Friday

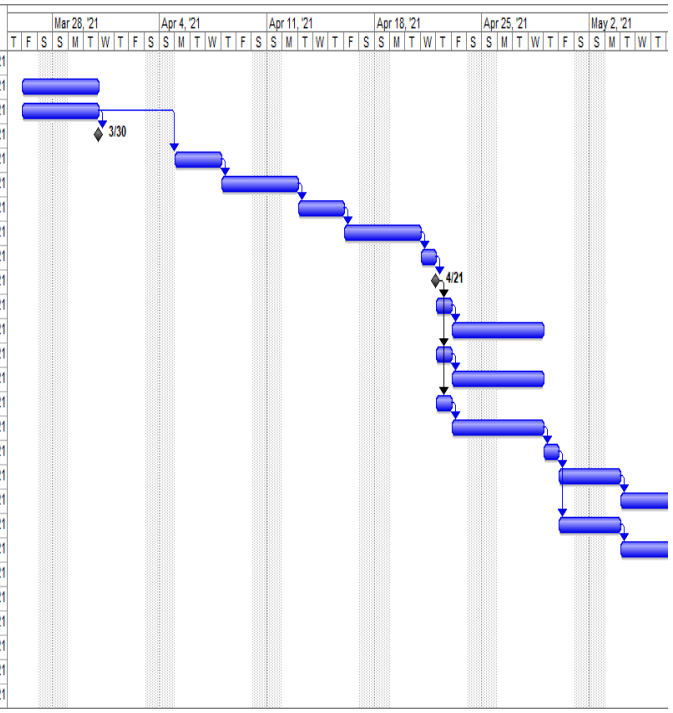
Tuesday, May 18, 2019: Flag Day

Thursday, June 3, 2019: Corpus Christi

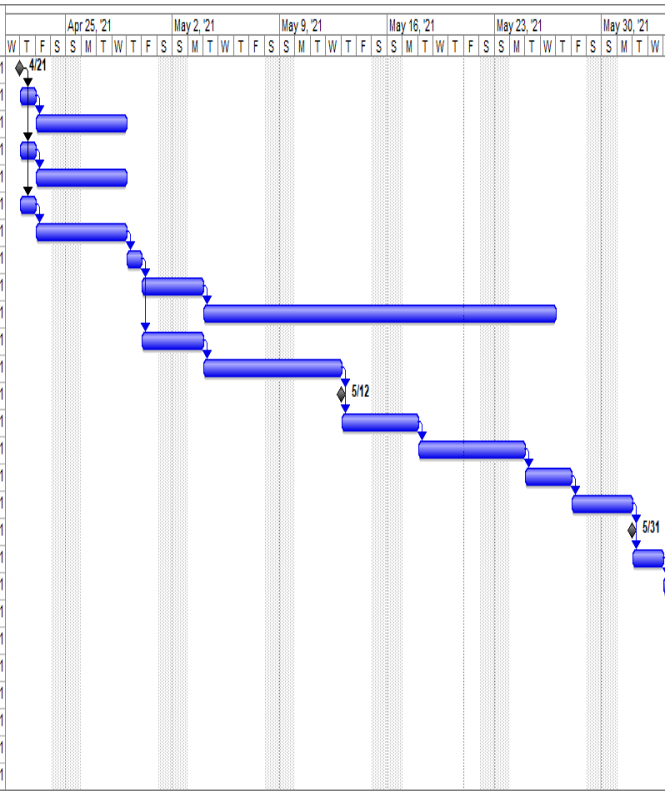
| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | Intranet Development Project | 101 days? | Mon 3/1/21 | Mon 7/19/21 |
| 2 | Project mangement/project initiation | 0 days | Mon 3/1/21 | Mon 3/1/21 |
| 3 | 1.1.1 Get Board's Approval and Responsible Stakeholders agreement | 0 days | Mon 3/1/21 | Mon 3/1/21 |
| 4 | 1.1.2 Signing of Loan Agreement | 2 days | Mon 3/1/21 | Tue 3/2/21 |
| 5 | 1.1.3 Procure Service Contracts | 5 days | Wed 3/3/21 | Tue 3/9/21 |
| 6 | 1.1.4 Hire Software Department Company | 2 days | Wed 3/10/21 | Thu 3/11/21 |
| 7 | 1.2.1.1 Collect requirements from stakeholders | 4 days | Fri 3/12/21 | Wed 3/17/21 |
| 8 | 1.2.2.1 Develop functional specification of the whole system | 3 days | Thu 3/18/21 | Mon 3/22/21 |
| 9 | 1.2.3.1 Get document approval | 3 days | Tue 3/23/21 | Thu 3/25/21 |
| 10 | Data collection and transmission | 0 days | Mon 3/22/21 | Mon 3/22/21 |
| 11 | 1.3.1.1.1 Define the Logical structure of database | 3 days | Fri 3/26/21 | Tue 3/30/21 |
| 12 | 1.3.1.2.1 Design physical structure of database | 3 days | Fri 3/26/21 | Tue 3/30/21 |
| 13 | Database modeling documentantion approved | 0 days | Tue 3/30/21 | Tue 3/30/21 |
| 14 | 1.3.2.1.1 Prepare user interface functional specifications | 3 days | Mon 4/5/21 | Wed 4/7/21 |
| 15 | 1.3.2.2.1 Prepare user interface technical specifications | 3 days | Thu 4/8/21 | Mon 4/12/21 |
| 16 | 1.3.3.1.1 Produce intranet application functional specifications | 3 days | Tue 4/13/21 | Thu 4/15/21 |
| 17 | 1.3.3.2.1 Produce intranet application technical specifications | 3 days | Fri 4/16/21 | Tue 4/20/21 |
| 18 | 1.3.4.3.1 Prepare and submit Reports | 1 day | Wed 4/21/21 | Wed 4/21/21 |
| 19 | User interface and intranet documentation appoved | 0 days | Wed 4/21/21 | Wed 4/21/21 |
| 20 | 1.4.1.1.1 Design Review of database specifications | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 21 | 1.4.1.2.1 Coding of database management system | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 22 | 1.4.2.1.1 Design review of user interface specification | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 23 | 1.4.2.2.1 Coding of user interface application | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 24 | 1.4.3.1.1 Design review of intranet specifications | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 25 | 1.4.3.2.1 Coding for intranet software | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 26 | 1.4.4.3.1 Prepare and submit Reports | 1 day | Thu 4/29/21 | Thu 4/29/21 |
| 27 | 1.5.1.1.1 Select providers for hardware | 2 days | Fri 4/30/21 | Mon 5/3/21 |



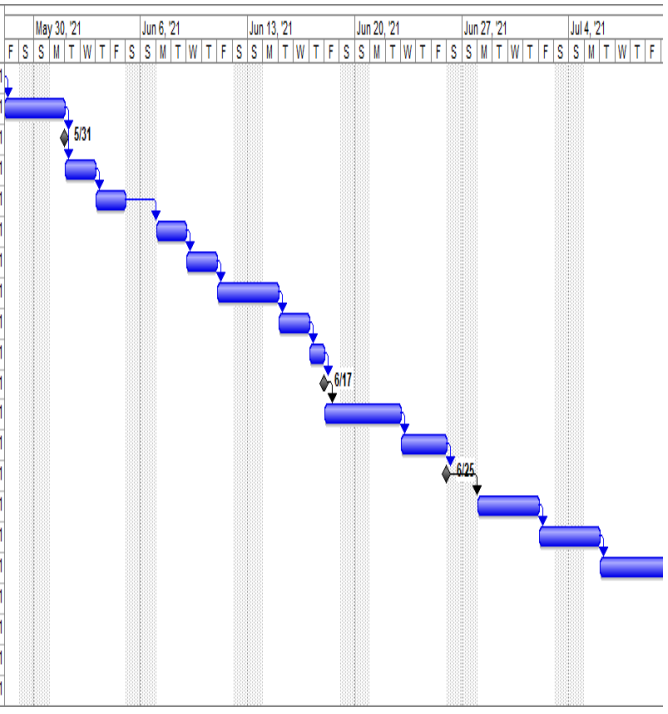

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 10 | Data collection and transmission | 0 days | Mon 3/22/21 | Mon 3/22/21 |
| 11 | 1.3.1.1.1 Define the Logical structure of database | 3 days | Fri 3/26/21 | Tue 3/30/21 |
| 12 | 1.3.1.2.1 Design physical structure of database | 3 days | Fri 3/26/21 | Tue 3/30/21 |
| 13 | Database modeling documentantion approved | 0 days | Tue 3/30/21 | Tue 3/30/21 |
| 14 | 1.3.2.1.1 Prepare user interface functional specifications | 3 days | Mon 4/5/21 | Wed 4/7/21 |
| 15 | 1.3.2.2.1 Prepare user interface technical specifications | 3 days | Thu 4/8/21 | Mon 4/12/21 |
| 16 | 1.3.3.1.1 Produce intranet application functional specifications | 3 days | Tue 4/13/21 | Thu 4/15/21 |
| 17 | 1.3.3.2.1 Produce intranet application technical specifications | 3 days | Fri 4/16/21 | Tue 4/20/21 |
| 18 | 1.3.4.3.1 Prepare and submit Reports | 1 day | Wed 4/21/21 | Wed 4/21/21 |
| 19 | User interface and intranet documentation appoved | 0 days | Wed 4/21/21 | Wed 4/21/21 |
| 20 | 1.4.1.1.1 Design Review of database specifications | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 21 | 1.4.1.2.1 Coding of database management system | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 22 | 1.4.2.1.1 Design review of user interface specification | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 23 | 1.4.2.2.1 Coding of user interface application | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 24 | 1.4.3.1.1 Design review of intranet specifications | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 25 | 1.4.3.2.1 Coding for intranet software | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 26 | 1.4.4.3.1 Prepare and submit Reports | 1 day | Thu 4/29/21 | Thu 4/29/21 |
| 27 | 1.5.1.1.1 Select providers for hardware | 2 days | Fri 4/30/21 | Mon 5/3/21 |
| 28 | 1.5.1.2.1 Purchase and deliver of hardware | 17 days | Tue 5/4/21 | Wed 5/26/21 |
| 29 | 1.5.2.1.1 Select providers for software | 2 days | Fri 4/30/21 | Mon 5/3/21 |
| 30 | 1.5.2.2.1 Purchase and deliver Software/license | 7 days | Tue 5/4/21 | Wed 5/12/21 |
| 31 | Implementation of database, user-interface, and intranet | 0 days | Wed 5/12/21 | Wed 5/12/21 |
| 32 | 1.5.3.2.1 Implement all components of sytem | 3 days | Thu 5/13/21 | Mon 5/17/21 |
| 33 | 1.5.4.1.1 Verify Software/hardware integration | 5 days | Tue 5/18/21 | Mon 5/24/21 |
| 34 | 1.5.4.2.1 Install application | 3 days | Tue 5/25/21 | Thu 5/27/21 |
| 35 | 1.5.4.3.1 Transfer the whole system to the testing phase | 2 days | Fri 5/28/21 | Mon 5/31/21 |
| 36 | Testing documentation | 0 days | Mon 5/31/21 | Mon 5/31/21 |

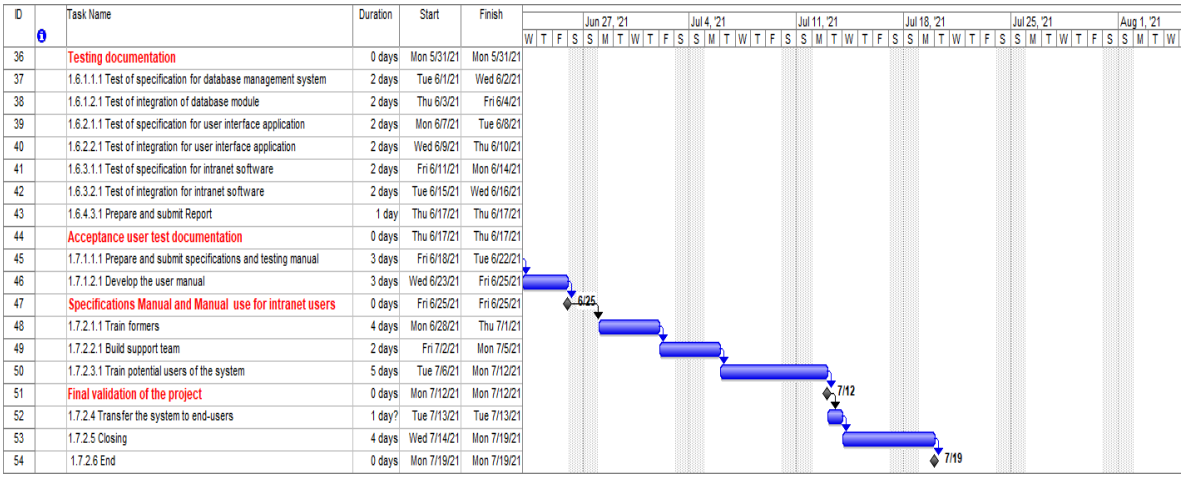


| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 19 | User interface and intranet documentation appoved | 0 days | Wed 4/21/21 | Wed 4/21/21 |
| 20 | 1.4.1.1.1 Design Review of database specifications | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 21 | 1.4.1.2.1 Coding of database management system | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 22 | 1.4.2.1.1 Design review of user interface specification | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 23 | 1.4.2.2.1 Coding of user interface application | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 24 | 1.4.3.1.1 Design review of intranet specifications | 1 day | Thu 4/22/21 | Thu 4/22/21 |
| 25 | 1.4.3.2.1 Coding for intranet software | 4 days | Fri 4/23/21 | Wed 4/28/21 |
| 26 | 1.4.4.3.1 Prepare and submit Reports | 1 day | Thu 4/29/21 | Thu 4/29/21 |
| 27 | 1.5.1.1.1 Select providers for hardware | 2 days | Fri 4/30/21 | Mon 5/3/21 |
| 28 | 1.5.1.2.1 Purchase and deliver of hardware | 17 days | Tue 5/4/21 | Wed 5/26/21 |
| 29 | 1.5.2.1.1 Select providers for software | 2 days | Fri 4/30/21 | Mon 5/3/21 |
| 30 | 1.5.2.2.1 Purchase and deliver Software/license | 7 days | Tue 5/4/21 | Wed 5/12/21 |
| 31 | Implementation of database, user-interface, and intranet | 0 days | Wed 5/12/21 | Wed 5/12/21 |
| 32 | 1.5.3.2.1 Implement all components of sytem | 3 days | Thu 5/13/21 | Mon 5/17/21 |
| 33 | 1.5.4.1.1 Verify Software/hardware integration | 5 days | Tue 5/18/21 | Mon 5/24/21 |
| 34 | 1.5.4.2.1 Install application | 3 days | Tue 5/25/21 | Thu 5/27/21 |
| 35 | 1.5.4.3.1 Transfer the whole system to the testing phase | 2 days | Fri 5/28/21 | Mon 5/31/21 |
| 36 | Testing documentation | 0 days | Mon 5/31/21 | Mon 5/31/21 |
| 37 | 1.6.1.1.1 Test of specification for database management system | 2 days | Tue 6/1/21 | Wed 6/2/21 |
| 38 | 1.6.1.2.1 Test of integration of database module | 2 days | Thu 6/3/21 | Fri 6/4/21 |
| 39 | 1.6.2.1.1 Test of specification for user interface application | 2 days | Mon 6/7/21 | Tue 6/8/21 |
| 40 | 1.6.2.2.1 Test of integration for user interface application | 2 days | Wed 6/9/21 | Thu 6/10/21 |
| 41 | 1.6.3.1.1 Test of specification for intranet software | 2 days | Fri 6/11/21 | Mon 6/14/21 |
| 42 | 1.6.3.2.1 Test of integration for intranet software | 2 days | Tue 6/15/21 | Wed 6/16/21 |
| 43 | 1.6.4.3.1 Prepare and submit Report | 1 day | Thu 6/17/21 | Thu 6/17/21 |
| 44 | Acceptance user test documentation | 0 days | Thu 6/17/21 | Thu 6/17/21 |
| 45 | 1.7.1.1.1 Prepare and submit specifications and testing manual | 3 days | Fri 6/18/21 | Tue 6/22/21 |




| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 34 | 1.5.4.2.1 Install application | 3 days | Tue 5/25/21 | Thu 5/27/21 |
| 35 | 1.5.4.3.1 Transfer the whole system to the testing phase | 2 days | Fri 5/28/21 | Mon 5/31/21 |
| 36 | Testing documentation | 0 days | Mon 5/31/21 | Mon 5/31/21 |
| 37 | 1.6.1.1.1 Test of specification for database management system | 2 days | Tue 6/1/21 | Wed 6/2/21 |
| 38 | 1.6.1.2.1 Test of integration of database module | 2 days | Thu 6/3/21 | Fri 6/4/21 |
| 39 | 1.6.2.1.1 Test of specification for user interface application | 2 days | Mon 6/7/21 | Tue 6/8/21 |
| 40 | 1.6.2.2.1 Test of integration for user interface application | 2 days | Wed 6/9/21 | Thu 6/10/21 |
| 41 | 1.6.3.1.1 Test of specification for intranet software | 2 days | Fri 6/11/21 | Mon 6/14/21 |
| 42 | 1.6.3.2.1 Test of integration for intranet software | 2 days | Tue 6/15/21 | Wed 6/16/21 |
| 43 | 1.6.4.3.1 Prepare and submit Report | 1 day | Thu 6/17/21 | Thu 6/17/21 |
| 44 | Acceptance user test documentation | 0 days | Thu 6/17/21 | Thu 6/17/21 |
| 45 | 1.7.1.1.1 Prepare and submit specifications and testing manual | 3 days | Fri 6/18/21 | Tue 6/22/21 |
| 46 | 1.7.1.2.1 Develop the user manual | 3 days | Wed 6/23/21 | Fri 6/25/21 |
| 47 | Specifications Manual and Manual use for intranet users | 0 days | Fri 6/25/21 | Fri 6/25/21 |
| 48 | 1.7.2.1.1 Train formers | 4 days | Mon 6/28/21 | Thu 7/1/21 |
| 49 | 1.7.2.2.1 Build support team | 2 days | Fri 7/2/21 | Mon 7/5/21 |
| 50 | 1.7.2.3.1 Train potential users of the system | 5 days | Tue 7/6/21 | Mon 7/12/21 |
| 51 | Final validation of the project | 0 days | Mon 7/12/21 | Mon 7/12/21 |
| 52 | 1.7.2.4 Transfer the system to end-users | 1 day? | Tue 7/13/21 | Tue 7/13/21 |
| 53 | 1.7.2.5 Closing | 4 days | Wed 7/14/21 | Mon 7/19/21 |
| 54 | 1.7.2.6 End | 0 days | Mon 7/19/21 | Mon 7/19/21 |





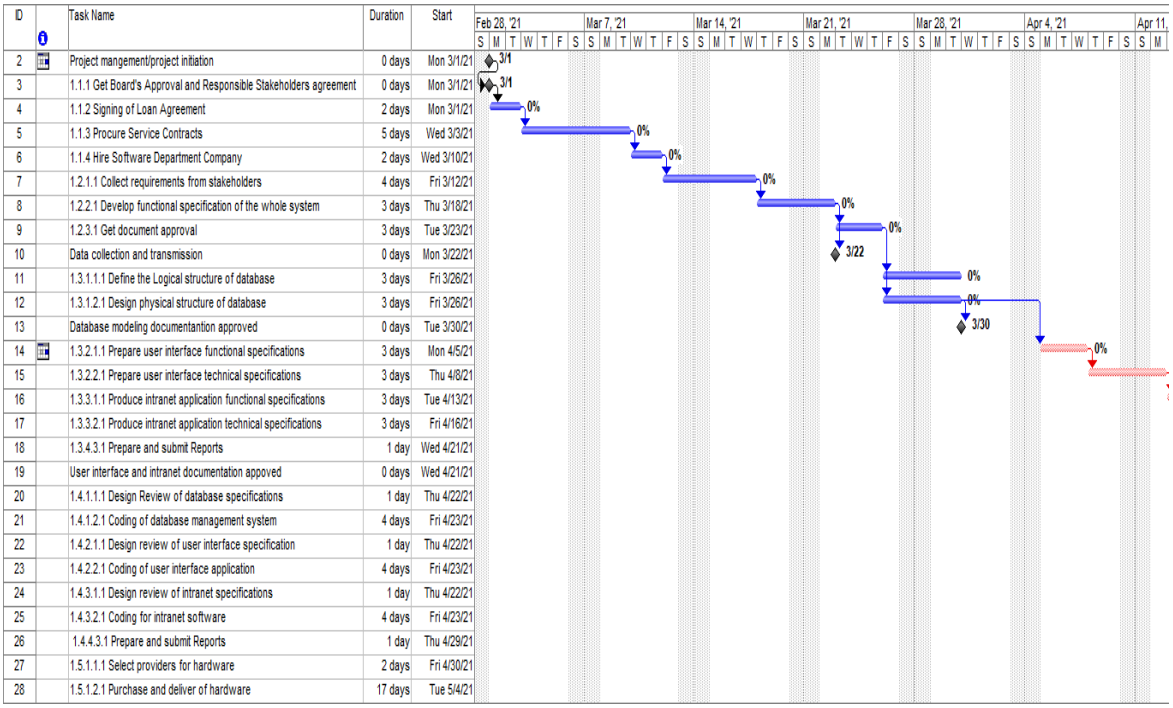
| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 36 | Testing documentation | 0 days | Mon 5/31/21 | Mon 5/31/21 |
| 37 | 1.6.1.1.1 Test of specification for database management system | 2 days | Tue 6/1/21 | Wed 6/2/21 |
| 38 | 1.6.1.2.1 Test of integration of database module | 2 days | Thu 6/3/21 | Fri 6/4/21 |
| 39 | 1.6.2.1.1 Test of specification for user interface application | 2 days | Mon 6/7/21 | Tue 6/8/21 |
| 40 | 1.6.2.2.1 Test of integration for user interface application | 2 days | Wed 6/9/21 | Thu 6/10/21 |
| 41 | 1.6.3.1.1 Test of specification for intranet software | 2 days | Fri 6/11/21 | Mon 6/14/21 |
| 42 | 1.6.3.2.1 Test of integration for intranet software | 2 days | Tue 6/15/21 | Wed 6/16/21 |
| 43 | 1.6.4.3.1 Prepare and submit Report | 1 day | Thu 6/17/21 | Thu 6/17/21 |
| 44 | Acceptance user test documentation | 0 days | Thu 6/17/21 | Thu 6/17/21 |
| 45 | 1.7.1.1.1 Prepare and submit specifications and testing manual | 3 days | Fri 6/18/21 | Tue 6/22/21 |
| 46 | 1.7.1.2.1 Develop the user manual | 3 days | Wed 6/23/21 | Fri 6/25/21 |
| 47 | Specifications Manual and Manual use for intranet users | 0 days | Fri 6/25/21 | Fri 6/25/21 |
| 48 | 1.7.2.1.1 Train formers | 4 days | Mon 6/28/21 | Thu 7/1/21 |
| 49 | 1.7.2.2.1 Build support team | 2 days | Fri 7/2/21 | Mon 7/5/21 |
| 50 | 1.7.2.3.1 Train potential users of the system | 5 days | Tue 7/6/21 | Mon 7/12/21 |
| 51 | Final validation of the project | 0 days | Mon 7/12/21 | Mon 7/12/21 |
| 52 | 1.7.2.4 Transfer the system to end-users | 1 day? | Tue 7/13/21 | Tue 7/13/21 |
| 53 | 1.7.2.5 Closing | 4 days | Wed 7/14/21 | Mon 7/19/21 |
| 54 | 1.7.2.6 End | 0 days | Mon 7/19/21 | Mon 7/19/21 |



**Figure 8 : Project Schedule (Source: Gabriel Duvalsaint, the author, 2021)**

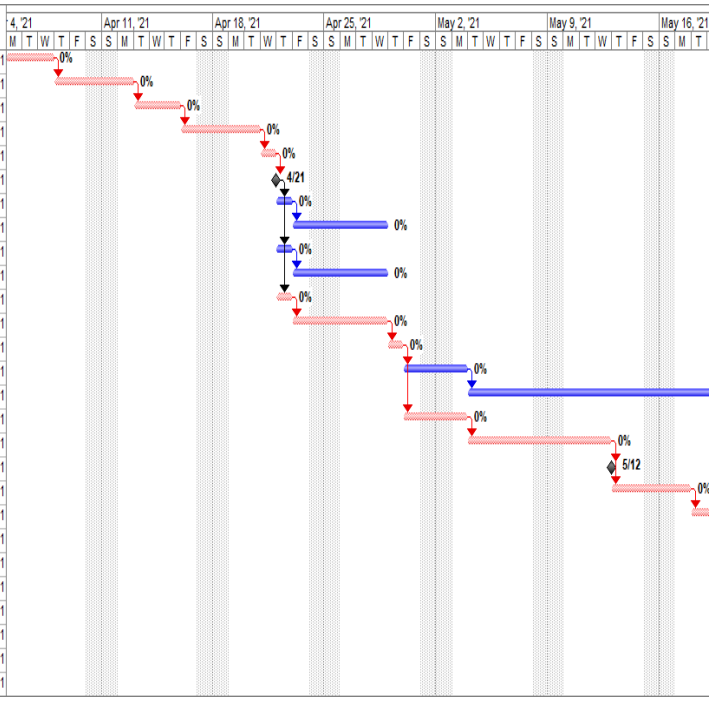
### 4.3.7 Critical Path (Shown in the Project Schedule)

The critical path of the intranet development project has been identified. The activities are highlighted in red in the project schedule. The activities of the critical path are shown below in Figure 9.

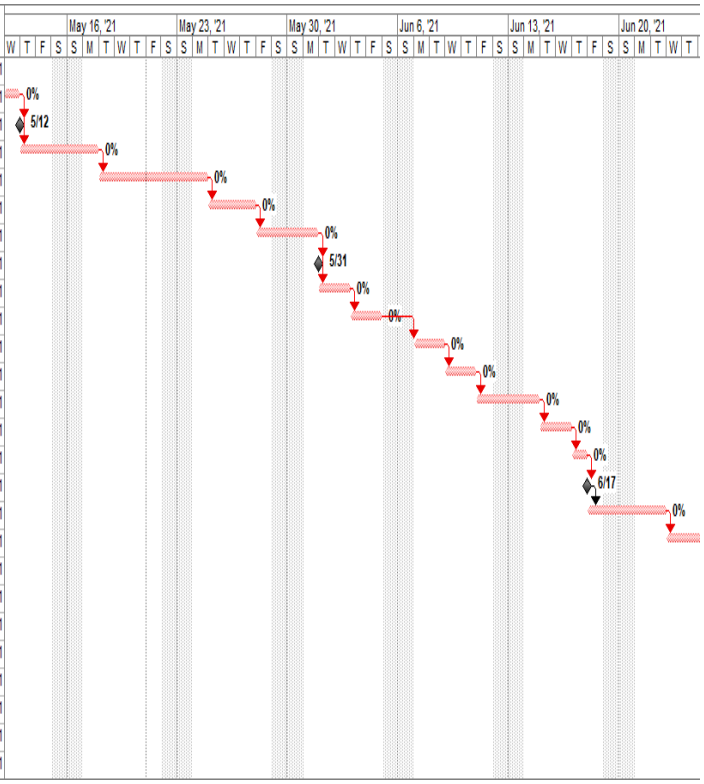


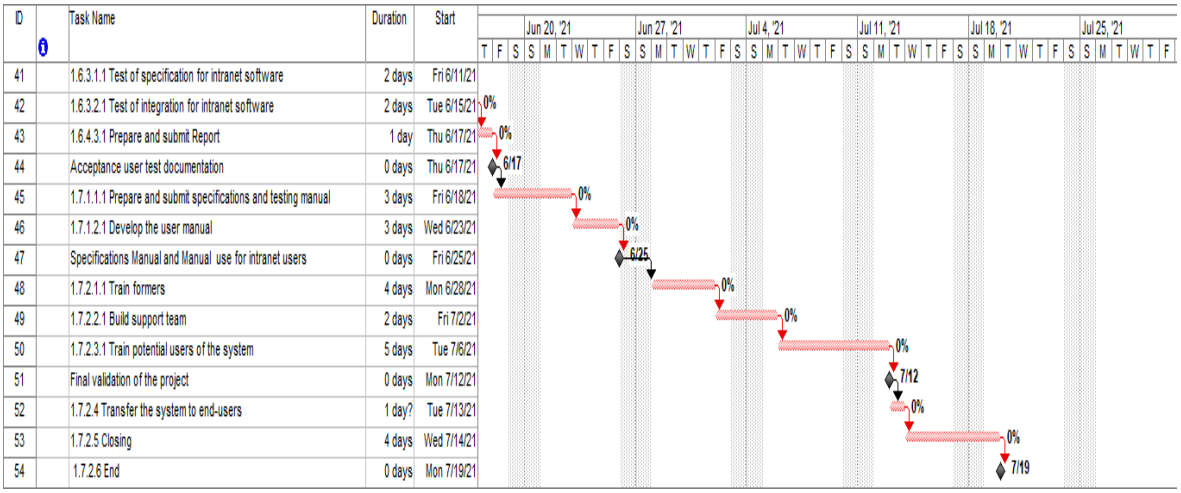
| ID | Task Name | Duration | Start |
|---|---|---|---|
| 2 | Project mangement/project initiation | 0 days | Mon 3/1/21 |
| 3 | 1.1.1 Get Board's Approval and Responsible Stakeholders agreement | 0 days | Mon 3/1/21 |
| 4 | 1.1.2 Signing of Loan Agreement | 2 days | Mon 3/1/21 |
| 5 | 1.1.3 Procure Service Contracts | 5 days | Wed 3/3/21 |
| 6 | 1.1.4 Hire Software Department Company | 2 days | Wed 3/10/21 |
| 7 | 1.2.1.1 Collect requirements from stakeholders | 4 days | Fri 3/12/21 |
| 8 | 1.2.2.1 Develop functional specification of the whole system | 3 days | Thu 3/18/21 |
| 9 | 1.2.3.1 Get document approval | 3 days | Tue 3/23/21 |
| 10 | Data collection and transmission | 0 days | Mon 3/22/21 |
| 11 | 1.3.1.1.1 Define the Logical structure of database | 3 days | Fri 3/26/21 |
| 12 | 1.3.1.2.1 Design physical structure of database | 3 days | Fri 3/26/21 |
| 13 | Database modeling documentantion approved | 0 days | Tue 3/30/21 |
| 14 | 1.3.2.1.1 Prepare user interface functional specifications | 3 days | Mon 4/5/21 |
| 15 | 1.3.2.2.1 Prepare user interface technical specifications | 3 days | Thu 4/8/21 |
| 16 | 1.3.3.1.1 Produce intranet application functional specifications | 3 days | Tue 4/13/21 |
| 17 | 1.3.3.2.1 Produce intranet application technical specifications | 3 days | Fri 4/16/21 |
| 18 | 1.3.4.3.1 Prepare and submit Reports | 1 day | Wed 4/21/21 |
| 19 | User interface and intranet documentation appoved | 0 days | Wed 4/21/21 |
| 20 | 1.4.1.1.1 Design Review of database specifications | 1 day | Thu 4/22/21 |
| 21 | 1.4.1.2.1 Coding of database management system | 4 days | Fri 4/23/21 |
| 22 | 1.4.2.1.1 Design review of user interface specification | 1 day | Thu 4/22/21 |
| 23 | 1.4.2.2.1 Coding of user interface application | 4 days | Fri 4/23/21 |
| 24 | 1.4.3.1.1 Design review of intranet specifications | 1 day | Thu 4/22/21 |
| 25 | 1.4.3.2.1 Coding for intranet software | 4 days | Fri 4/23/21 |
| 26 | 1.4.4.3.1 Prepare and submit Reports | 1 day | Thu 4/29/21 |
| 27 | 1.5.1.1.1 Select providers for hardware | 2 days | Fri 4/30/21 |
| 28 | 1.5.1.2.1 Purchase and deliver of hardware | 17 days | Tue 5/4/21 |

| ID | Task Name | Duration | Start |
|---|---|---|---|
| 14 | 1.3.2.1.1 Prepare user interface functional specifications | 3 days | Mon 4/5/21 |
| 15 | 1.3.2.2.1 Prepare user interface technical specifications | 3 days | Thu 4/8/21 |
| 16 | 1.3.3.1.1 Produce intranet application functional specifications | 3 days | Tue 4/13/21 |
| 17 | 1.3.3.2.1 Produce intranet application technical specifications | 3 days | Fri 4/16/21 |
| 18 | 1.3.4.3.1 Prepare and submit Reports | 1 day | Wed 4/21/21 |
| 19 | User interface and intranet documentation appoved | 0 days | Wed 4/21/21 |
| 20 | 1.4.1.1.1 Design Review of database specifications | 1 day | Thu 4/22/21 |
| 21 | 1.4.1.2.1 Coding of database management system | 4 days | Fri 4/23/21 |
| 22 | 1.4.2.1.1 Design review of user interface specification | 1 day | Thu 4/22/21 |
| 23 | 1.4.2.2.1 Coding of user interface application | 4 days | Fri 4/23/21 |
| 24 | 1.4.3.1.1 Design review of intranet specifications | 1 day | Thu 4/22/21 |
| 25 | 1.4.3.2.1 Coding for intranet software | 4 days | Fri 4/23/21 |
| 26 | 1.4.4.3.1 Prepare and submit Reports | 1 day | Thu 4/29/21 |
| 27 | 1.5.1.1.1 Select providers for hardware | 2 days | Fri 4/30/21 |
| 28 | 1.5.1.2.1 Purchase and deliver of hardware | 17 days | Tue 5/4/21 |
| 29 | 1.5.2.1.1 Select providers for software | 2 days | Fri 4/30/21 |
| 30 | 1.5.2.2.1 Purchase and deliver Software/license | 7 days | Tue 5/4/21 |
| 31 | Implementation of database, user-interface, and intranet | 0 days | Wed 5/12/21 |
| 32 | 1.5.3.2.1 Implement all components of sytem | 3 days | Thu 5/13/21 |
| 33 | 1.5.4.1.1 Verify Software/hardware integration | 5 days | Tue 5/18/21 |
| 34 | 1.5.4.2.1 Install application | 3 days | Tue 5/25/21 |
| 35 | 1.5.4.3.1 Transfer the whole system to the testing phase | 2 days | Fri 5/28/21 |
| 36 | Testing documentation | 0 days | Mon 5/31/21 |
| 37 | 1.6.1.1.1 Test of specification for database management system | 2 days | Tue 6/1/21 |
| 38 | 1.6.1.2.1 Test of integration of database module | 2 days | Thu 6/3/21 |
| 39 | 1.6.2.1.1 Test of specification for user interface application | 2 days | Mon 6/7/21 |
| 40 | 1.6.2.2.1 Test of integration for user interface application | 2 days | Wed 6/9/21 |




| ID | Task Name | Duration | Start |
|---|---|---|---|
| 29 | 1.5.2.1.1 Select providers for software | 2 days | Fri 4/30/21 |
| 30 | 1.5.2.2.1 Purchase and deliver Software/license | 7 days | Tue 5/4/21 |
| 31 | Implementation of database, user-interface, and intranet | 0 days | Wed 5/12/21 |
| 32 | 1.5.3.2.1 Implement all components of sytem | 3 days | Thu 5/13/21 |
| 33 | 1.5.4.1.1 Verify Software/hardware integration | 5 days | Tue 5/18/21 |
| 34 | 1.5.4.2.1 Install application | 3 days | Tue 5/25/21 |
| 35 | 1.5.4.3.1 Transfer the whole system to the testing phase | 2 days | Fri 5/28/21 |
| 36 | Testing documentation | 0 days | Mon 5/31/21 |
| 37 | 1.6.1.1.1 Test of specification for database management system | 2 days | Tue 6/1/21 |
| 38 | 1.6.1.2.1 Test of integration of database module | 2 days | Thu 6/3/21 |
| 39 | 1.6.2.1.1 Test of specification for user interface application | 2 days | Mon 6/7/21 |
| 40 | 1.6.2.2.1 Test of integration for user interface application | 2 days | Wed 6/9/21 |
| 41 | 1.6.3.1.1 Test of specification for intranet software | 2 days | Fri 6/11/21 |
| 42 | 1.6.3.2.1 Test of integration for intranet software | 2 days | Tue 6/15/21 |
| 43 | 1.6.4.3.1 Prepare and submit Report | 1 day | Thu 6/17/21 |
| 44 | Acceptance user test documentation | 0 days | Thu 6/17/21 |
| 45 | 1.7.1.1.1 Prepare and submit specifications and testing manual | 3 days | Fri 6/18/21 |
| 46 | 1.7.1.2.1 Develop the user manual | 3 days | Wed 6/23/21 |
| 47 | Specifications Manual and Manual use for intranet users | 0 days | Fri 6/25/21 |
| 48 | 1.7.2.1.1 Train formers | 4 days | Mon 6/28/21 |
| 49 | 1.7.2.2.1 Build support team | 2 days | Fri 7/2/21 |
| 50 | 1.7.2.3.1 Train potential users of the system | 5 days | Tue 7/6/21 |
| 51 | Final validation of the project | 0 days | Mon 7/12/21 |
| 52 | 1.7.2.4 Transfer the system to end-users | 1 day? | Tue 7/13/21 |
| 53 | 1.7.2.5 Closing | 4 days | Wed 7/14/21 |
| 54 | 1.7.2.6 End | 0 days | Mon 7/19/21 |





| ID | Task Name | Duration | Start |
|---|---|---|---|
| 41 | 1.6.3.1.1 Test of specification for intranet software | 2 days | Fri 6/11/21 |
| 42 | 1.6.3.2.1 Test of integration for intranet software | 2 days | Tue 6/15/21 |
| 43 | 1.6.4.3.1 Prepare and submit Report | 1 day | Thu 6/17/21 |
| 44 | Acceptance user test documentation | 0 days | Thu 6/17/21 |
| 45 | 1.7.1.1.1 Prepare and submit specifications and testing manual | 3 days | Fri 6/18/21 |
| 46 | 1.7.1.2.1 Develop the user manual | 3 days | Wed 6/23/21 |
| 47 | Specifications Manual and Manual use for intranet users | 0 days | Fri 6/25/21 |
| 48 | 1.7.2.1.1 Train formers | 4 days | Mon 6/28/21 |
| 49 | 1.7.2.2.1 Build support team | 2 days | Fri 7/2/21 |
| 50 | 1.7.2.3.1 Train potential users of the system | 5 days | Tue 7/6/21 |
| 51 | Final validation of the project | 0 days | Mon 7/12/21 |
| 52 | 1.7.2.4 Transfer the system to end-users | 1 day? | Tue 7/13/21 |
| 53 | 1.7.2.5 Closing | 4 days | Wed 7/14/21 |
| 54 | 1.7.2.6 End | 0 days | Mon 7/19/21 |



**Figure 9 : Project Critical Path (Source: Gabriel Duvalsaint, the author, 2021)**

### 4.3.8 Reserve Analysis

Contingency reserves are referred to as schedule reserves that account for schedule uncertainty. Contingency reserves are the estimated duration within the schedule baseline that is allocated for the identified risks that are accepted. They may be a percentage or a fixed number of works. The methods used for contingency estimation are generally divided into 'Deterministic' and 'Probabilistic' classes (Moselhi, 1997).

Deterministic methods most traditionally employed involve the simple assignment of a percentage contingency based upon the estimate of project cost or time or based upon subcomponents of project cost or time. The deterministic methods are usually grouped in two sub-groups: Percentage of overall value and Percentage of item by item values.

Probabilistic methods involve assigning probability distribution functions to project cost or time components and then, through a summative process, developing a probability distribution function for the overall project cost or time itself. Among probabilistic methods, we have the PERT/PNET or similar weighted average techniques; the Pareto principle, (80/20) rule; and Monte Carlo simulation (MCS) technique. For this assignment, we will use the PERT / PNET techniques.

When contingency is calculated using probabilistic methods, the contingency allowance is usually expressed as a 'P' or probability value typically from P5 to P95.

P50 represents the project cost or schedule with sufficient risk provisions to provide a 50% level of confidence in the outcome i.e., there is 50% likelihood that the project cost (or schedule) will not be exceeded.

Considering that the critical path activities follow a normal probability distribution, it can be established that there is a 50% probability of finishing this project in 101 days. If we increase the probability to 84%, the time of the project will be closed to 103 days (101+ 2), where 2 is the standard deviation critical path. The three-point estimating techniques in Chart 15 will show the standard deviation for the critical path of the project.

**Chart 15, Three-Point Estimating Techniques (Source: Gabriel Duvalsaint, the author, April 2021)**

| Activity | Optimistic tO | Most likely tM | Pessimistic tP | Estimated Activity Duration (tO+4tM+tP)/6 | Variance ((tP-tM)/6)^2 |
|---|---|---|---|---|---|
| Get Board's Approval and Responsible Stakeholders agreement | 0 | 0 | 0 | 0 | 0.00 |
| Signing of Loan Agreement | 1 | 2 | 4 | 2 | 0.25 |
| Procure Service Contracts | 4 | 5 | 6 | 5 | 0.11 |
| Hire Software Department Company | 1 | 2 | 3 | 2 | 0.11 |
| Collect requirements | 3 | 4 | 5 | 4 | 0.11 |
| Functional specification | 2 | 3 | 5 | 3 | 0.25 |
| Document approval | 1 | 3 | 5 | 3 | 0.44 |
| Logical structure | 2 | 3 | 4 | 3 | 0.11 |
| Physical structure | 2 | 3 | 4 | 3 | 0.11 |
| User interface functional specifications | 2 | 3 | 4 | 3 | 0.11 |
| User interface technical specifications | 2 | 3 | 4 | 3 | 0.11 |
| Intranet application functional specifications | 2 | 3 | 4 | 3 | 0.11 |
| Intranet application technical specifications | 2 | 3 | 4 | 3 | 0.11 |
| Reports | 1 | 1 | 2 | 1 | 0.03 |
| Design Review | 1 | 1 | 2 | 1 | 0.03 |
| Coding | 3 | 4 | 6 | 4 | 0.25 |
| Design Review | 1 | 1 | 2 | 1 | 0.03 |
| Coding | 3 | 4 | 6 | 4 | 0.25 |
| Design Review | 1 | 1 | 2 | 1 | 0.03 |
| Coding | 3 | 4 | 5 | 4 | 0.11 |
| Reports | 1 | 1 | 2 | 1 | 0.03 |
| Providers selection | 1 | 2 | 3 | 2 | 0.11 |
| Hardware purchase | 15 | 17 | 20 | 17 | 0.69 |
| Providers selection | 1 | 2 | 3 | 2 | 0.11 |
| Software purchase | 5 | 7 | 9 | 7 | 0.44 |
| Implementation component | 2 | 3 | 5 | 3 | 0.25 |
| Software/hardware integration | 4 | 5 | 6 | 5 | 0.11 |
| Application installation | 2 | 3 | 4 | 3 | 0.11 |
| System transfers to testing phase | 1 | 2 | 3 | 2 | 0.11 |
| Specification testing | 1 | 2 | 3 | 2 | 0.11 |
| Integration testing | 1 | 2 | 3 | 2 | 0.11 |
| Specification testing | 1 | 2 | 3 | 2 | 0.11 |
| Integration testing | 1 | 2 | 3 | 2 | 0.11 |
| Specification testing | 1 | 2 | 3 | 2 | 0.11 |
| Integration testing | 1 | 2 | 3 | 2 | 0.11 |
| Report approval | 1 | 1 | 2 | 1 | 0.03 |
| Specifications and testing manual | 2 | 3 | 4 | 3 | 0.11 |
| User manual | 2 | 3 | 4 | 3 | 0.11 |
| Formers formation | 3 | 4 | 5 | 4 | 0.11 |
| Support team | 1 | 2 | 3 | 2 | 0.11 |
| Training potential users | 4 | 5 | 6 | 5 | 0.11 |
| System transfers to end-users | 1 | 1 | 2 | 1 | 0.03 |
| Closing | 3 | 4 | 5 | 4 | 0.11 |
| End | 0 | 0 | 0 | 0 | 0.00 |
| | | | | | |
| **Total variance for critical path** | | | | | **3.39** |
| **Standard deviation** | | | | | **2** |

### 4.3.9 Schedule Control Procedure

The project schedule will be reviewed and updated as necessary, after monthly meetings for progress verification. The project manager is responsible for managing updates and reviews, determining the impacts of schedule variances, submitting schedule change requests, and reporting the schedule status in accordance with the project's communication plan.

The project team is responsible for participating in schedule updates, communicating any changes to the actual start/finish dates to the project manager, and participating in schedule variance resolution activities as needed.
The project sponsor will maintain the awareness of the project schedule status and review/approve any schedule change requests submitted by the project manager.

### 4.4. Project Cost Management

Project cost management includes the processes required to ensure that a project team completes a project within an approved budget. The main planning processes performed as part of project cost management are planning cost management, estimating costs, and determining the budget. Estimating costs involves developing an approximation or cost estimate of the resources needed to complete a project. Cost budgeting involves allocating the overall cost estimate to individual tasks over time to establish a baseline for measuring performance. The main documents that are produced include a cost management plan, cost estimates, and a cost baseline *(Kathy Schwalbe (2017). Introduction to Project Management, fourth edition, Schwalbe*, p. 245).

#### 4.4.1 Cost Management Plan

The cost management plan clearly defines how the costs on a project will be managed throughout the project. It sets the format and standards by which the project costs are measured, reported, and controlled. It comprises the activities used to estimate, allocate, and control the costs of a project. It produces an approved budget, monitors costs throughout the project, and provides a basis for the decisions to control unexpected or extra costs.
In relation to the intranet development project, the project manager will be responsible for preparing, managing, and reporting on the cost of the project throughout its duration. The project manager and team are expected to prepare monthly project progress reports as well as any other reports requested by the sponsor and steering committee of the project. They are also expected to monitor the expenditures, commitments, and balance of funds under the project budget lines and draft project budget revisions.

Changes to the project or its budget must go through a review and approval process sealed with the signatures of the authorized personnel from the World Bank and the Ministry of Economy and Finances.

#### 4.4.1.1 Process Description and Importance

The cost management plan describes how the project costs will be planned, structured, and controlled. It helps project managers to determine the overall cost of a project. It should be noted that the project costs determined in this process are an estimation that becomes more accurate as more information of the project becomes available. Despite this, it is very important for project managers to have a good understanding of this process to avoid cost overruns. By nature, estimates have a variance, (how much the costs can differ based on the final project requirements). Project managers should aim to produce cost estimates with narrow variance gaps, as this indicates a minimal difference between the estimated costs and the actual project budget.

Upon developing the initial budget, the project manager must ensure it is being monitored and controlled by recording all incurred costs against the remaining funds of the initial budget. This will ensure that expenses remain within budget. It will also provide the project manager with current and updated available balances.

#### 4.4.1.2 Tools and Techniques to be Used on the Cost Management Plan

The tools and techniques identified for the plan cost management process in the PMBOK®Guide, 6th Edition, are the following: (a) expert judgement, (b) data analysis, and (c) meetings.

Acquiring expert judgement from individuals or groups with specialized knowledge or training in previous similar projects and cost estimating and budgeting can be beneficial in the planning and monitoring and controlling phases of the cost management process. Having access to such valuable information could shrink the process and thus save time.

Applying alternative analysis to the review strategy of funding will be crucial for the intranet development project. It can help the project manager and project team in the ways of acquiring resources for the project.

Meetings are the best opportunity for a project manager to distribute information and communicate with the team and stakeholders. This project makes an allocation for regular weekly and monthly review meetings.

#### 4.4.1.3 Units of Measure

The typical currency used for the cost of the activity and project budget will be the US dollar. Human resource measurements are staff/day. The lump sum amount can be used to estimate the cost of the activity with no historical information from previous projects.

#### 4.4.1.4 Level of Precision and Accuracy

The acceptable level of accuracy will be a small percentage, since this project is not a large one; therefore, a tight budget will suit. Thus, this project will be hinged on a ±5% range. In addition, a management reserve of 3% will be instituted in the event of any unforeseen changes, especially when dealing with fluctuating prices in information technology (IT) procurement. For precise dollar values, the estimates will be rounded off to the nearest dollar, for example $5,499.60 will be rounded up to $5,500, and $2572.40 will be rounded down to $2572.

#### 4.4.1.5 Organizational Procedure Links

The WBS will serve as framework for the cost management plan, allowing for the consistency with the estimates, budgets, project cost accounting, and cost control.

#### 4.4.1.6 Control Thresholds

For the intranet development project, if a team member feels a cost change is necessary, the project manager and team will meet to review and evaluate the change. The project team will determine which tasks are affected, calculate the variance, and generate a list of possible alternatives for consideration. If, after the evaluation is complete, the project manager determines that any change exceeds the established thresholds or boundaries, a change request will be submitted to the project committee and sponsor.

A change request will be necessary if either of the following two conditions is true:

• The proposed change is estimated to increase the work package cost by 10% or more when compared against the baseline.
• The proposed change is estimated to increase the project budget by 10% or more when compared against the baseline.

Once the cost change request is reviewed and approved, the project manager will record the change request result, store the documents in the project repository, modify the activity cost and project budget according to the approved change, and communicate the change and impacts to the project team and stakeholders.

#### 4.4.1.7 Rule of Performance

The intranet development project will use the cost variance and cost performance index (CPI) as the basis for measuring cost performance. The percent of complete work will be used as earned value management (EVM) techniques and EVM computation equations for calculating the projected estimate at completion (EAC) forecasts to provide a validity check on the bottom up EAC.

#### 4.4.1.8 Additional Details

Funding for this project will come directly from the project sponsor. Project records will be kept in an accounting program, such as a Microsoft Excel spread sheet. Reports are to be delivered by the project team to the project manager on a weekly basis. All invoices, contracts, or whatever money spent must be documented and stored away on a softcopy for quick retrieval.

### 4.4.2. Activity Cost Estimates

#### 4.4.2.1 Process Description and Importance

Estimating costs is the process of developing an approximation of the monetary resources needed to complete project activities. The first step in formulating an overall budget begins with estimating the cost of project activities within each deliverable or work package. This process gathers information from the activity list (completed previously), market conditions, and published commercial information to identify and weigh all relevant costs needed to complete different activities

involved in each work package, along with the required resource estimates and constraints. This will be used to formulate the financial plans and estimates that will feed into the budget.

The process involves applying several specific techniques and tools, in combination or separately. Some key techniques and tools that will be applied include bottom-up estimating, which consists of estimating the cost of individual work packages or activities to the greatest level of specified detail.

Analogous estimating, particularly ratio estimating, will be also used to estimate certain components of the intranet development project.

Another technique that is important to use in estimating the cost is expert judgement. The expertise of the sponsor can be used in determining the estimated cost of a certain activity and the budget of the project.

### 4.4.2.2 Activity Cost Estimates for Each Activity Including Back-Up Information

**Chart 16, Activity Cost Estimates (Source: Gabriel Duvalsaint, the author, April 2021**

| **Activity Cost Estimates** | |
|---|---|
| **FULL PROJECT NAME:** | PROJECT MANAGEMENT PLAN FOR THE DEVELOPMENT OF AN INTRANET FOR THE ECONOMIC DIVISION IN THE MINISTRY OF ECONOMY AND FINANCES |
| **DATE:** | **February 2021 - April 2021** |

| **ACTIVITY LIST** | | | | |
|---|---|---|---|---|
| **WBS Code** | **ACTIVITY NAME** | **Activity ID** | **Cost $USD** | **Basis of estimates** |
| **1.1** | | 1.1.1 | | To get the board's approval and the responsible stakeholders' agreement |
| | | 1.1.2 | | Signing of the loan agreement |
| | | 1.1.3 | 58,580.00 | • The project manager (full time) will be paid $190 per day for 101 days.<br>• Four staffs in the Economic Division will be part of the project team in support of the project and will be paid $60 per day for 101 days. |

| | | | | |
|---|---|---|---|---|
| | | | | • The web administrator working for the IT Division of the ministry will be affected by the project and will be paid $75 per day for 101 days.<br>• The system administrator working for the IT Division will be in support of the project and will be paid $75 per day for 101 days. |
| **1.2.1** | Collect requirements of stakeholders | 1.2.1.1 | 800.00 | Cost provided by the software development company. It includes the preparation of questionnaires, surveys, and face-to-face meetings with stakeholders for 4 days. |
| **1.2.2** | Develop the functional specification of the whole system | 1.2.2.1 | 600.00 | The development team composed of 4 junior engineers will provide the future description of the management information system and prepare the prototype. Each of them will be paid $ 50 per day for 3 days. |
| | S/Total | | 1,400.00 | |
| **1.3.1.1** | Define logical structure of database | 1.3.1.1.1 | 600.00 | Two senior software engineers will be paid $100 per day for 3 days. |
| **1.3.1.2** | Design physical structure of database | 1.3.1.2.1 | 600.00 | Two senior software engineers will be paid $100 per day for 3 days. |
| **1.3.2.1** | Prepare user interface functional specifications | 1.3.2.1.1 | 300.00 | Two junior software engineers will be paid $50 per day for 3 days. |
| **1.3.2.2** | Prepare user interface technical specifications | 1.3.2.2.1 | 300.00 | Two junior software engineers will be paid $50 per day for 2 days; plus, one senior engineer will be paid $100 for one day. |
| **1.3.3.1** | Produce intranet application functional specifications | 1.3.3.1.1 | 450.00 | Two application developers will be paid $75 per day for 3 days. |
| **1.3.3.2** | Produce intranet application technical specifications | 1.3.3.2.1 | 450.00 | Two application developers will be paid $75 per day for 3 days. |
| **1.3.4.3** | Submit reports | 1.3.4.3.1 | 250.00 | The lump sum from previous similar projects adjusted by inflation and exchange rate |
| | S/Total | | 2,950.00 | |
| **1.4.1.1** | Design review of | 1.4.1.1.1 | 300.00 | Two senior software engineers will be paid $150 per day to |

| | | | | |
|---|---|---|---|---|
| | database specifications | | | review the design and integrate new features requested by the stakeholders. |
| **1.4.1.2** | Coding of database management system | 1.4.1.2.1 | 3,200.00 | Four database specialists will be paid $200 per day to for 4 days to create the table and write the codes for developing the database. |
| **1.4.2.1** | Design review of user interface specifications | 1.4.2.1.1 | 300.00 | Two senior software engineers will be paid $150 per day to review the functional and technical specifications of the user interface. |
| **1.4.2.2** | Coding of user interface application | 1.4.2.2.1 | 2,400.00 | Three senior developers will be paid $200 per day for 4 days to write scripts and codes for developing the user interface. |
| **1.4.3.1** | Design review of intranet specifications | 1.4.3.1.1 | 300.00 | Two senior software engineers will be paid $150 per day to review the functional and technical specifications of the intranet. |
| **1.4.3.2** | Coding of intranet software. | 1.4.3.2.1 | 2,400.00 | Three senior developers will be paid $200 per day for 4 days to write scripts and codes for developing the intranet. |
| | S/Total | | 8,900.00 | |
| **1.5.1.1** | Select providers for hardware | 1.5.1.1.1 | 250.00 | Cost to prepare the providers' selection process to provide the hardware and other materials needed to implement the components of the project |
| **1.5.1.2** | Purchase and deliver of Hardware | 1.5.1.2.1 | 8024.73 | This cost is based on server specifications provided by the software development company, which costs $7829 on average plus 2.5% for shipment. |
| **1.5.2.1** | Select providers for software | 1.5.2.1.1 | 200.00 | Cost to prepare the providers' selection process to provide the hardware and other materials needed to implement the components of the project |
| **1.5.2.2** | Purchase and deliver Software/license | 1.5.2.2.1 | 14,630.00 | • The Windows Server 2012, Enterprise Edition costs $882.<br>• The Microsoft SQL Server 2012, Enterprise Edition costs $13748, of which $6874 are per core. |
| **1.5.3.2** | Implement all components | 1.5.3.2.1 | 250.00 | The lump sum from previous similar projects adjusted by the inflation and exchange rate |
| **1.5.4.1** | Integrate software with hardware | 1.5.4.1.1 | 450.00 | One senior engineer will be paid $90 per day for 5 days to install the application and component according to the approved requirement documentation. |
| **1.5.4.2** | Install application | 1.5.4.2.1 | 450.00 | Two senior engineers will be paid $112.5 per day for 3 days to install the application and component according to the approved requirement documentation. |
| **1.5.4.3** | Transfer the whole system to the testing phase | 1.5.4.3.1 | 200.00 | The lump sum from previous similar projects adjusted by the inflation and exchange rate |

| | | | | |
|---|---|---|---|---|
| | S/Total | | 24,454.73 | |
| **1.6.1.1** | Test of specification for database management system | 1.6.1.1.1 | 250.00 | One senior engineer will be paid $125 per day for 2 days to carry out quality testing to ensure the materials, software, and hardware meet the specifications provided for the data base system. |
| **1.6.1.2** | Test of integration of database module | 1.6.1.2.1 | 450.00 | Two senior engineers will be paid $125 per day for 2 days to test the module/component integration in collaboration with the project team. |
| **1.6.2.1** | Test of specification for user interface application | 1.6.2.1.1 | 250.00 | One senior engineer will be paid $125 per day for 2 days to conduct tests in accordance with the requirement specifications for the interface application. |
| **1.6.2.2** | Test of integration for user interface application | 1.6.2.2.1 | 400.00 | Two senior engineers will be paid $100 per day for 2 days to test the module/component integration in collaboration with the project team. |
| **1.6.3.1** | Test of specification for intranet software | 1.6.3.1.1 | 250.00 | One senior engineer will be paid $125 per day for 2 days to conduct tests in accordance with the requirement specifications for the intranet application. |
| **1.6.3.2** | Test of integration for intranet software | 1.6.3.2.1 | 600.00 | Three senior engineers will be paid $100 per day for 2 days to conduct tests in accordance with the requirement specifications for the intranet application. |
| | S/Total | | 2,200.00 | |
| | Prepare the user manual | 1.7.1.2.1 | 1750 | This cost includes the (i) writing documentation, (ii) reviewing style and orthography, (iii) diagram document, and (iv) printing three (3) copies |
| | Train for Formers | 1.7.2.1.1 | 800 | Cost to organize two days of training for a pool of four (4) trainers. It includes the documentation, software tools, token, etc. |
| | Build support team | 1.7.2.2.1 | 400 | The lump sum from previous similar projects adjusted by the inflation and exchange rate |
| | Train potential users of the system | 1.7.2.3.1 | 2500 | Cost to organize 5 days of training for potential users in the Economic Division. It includes the documentation, software tools, flash drive, external disk, token, etc. |
| | Transfers the system to end-users | 1.7.2.4 | 800 | The lump sum from previous similar projects adjusted by the inflation and exchange rate |
| | S/Total | | 6,250.00 | |
| **Total activity cost estimate** | | | **104,734.73** | |

### 4.4.3 Project Budget

#### 4.4.3.1 Process Description and Importance

In determining the budget, the techniques used are cost aggregation and reserve analysis. The process starts by determining the budget, which is the process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline. To determine the budget, the scope baseline is used, which provides the project deliverables, cost estimates, basis of estimates, and project schedule. This is important, as the approved budget is what drives project funding. It will tell stakeholders how much money is needed and when it is needed. The ability to have people, equipment, and materials when they are needed is dependent on the funding provided as a result of the budget.

In addition, the budget is important because it provides the basis for project cost control. By measuring the actual cost of the project against the approved budget, the project team can determine if the project is progressing according to the plan or if corrective action is needed. This is accomplished using a cost baseline. The project will consider different types of risks; therefore, a contingency reserve is incorporated in the cost estimates in order to address specific risks. On the other hand, a management reserve is added to the project cost baseline to address unforeseeable risks. The management reserve is not a calculated reserve, and neither is it a part of the cost baseline. Therefore, the project manager will seek permission to use this reserve whenever any unknown risk occurs. Chart 17 below presents the project budget for the intranet development.

### 4.4.3.2 Project Budget Chart Including work package Cost, Total Project Cost, Reserves (Contingency Reserve and Management Reserve Including the Justification for Both)

Risks occur in every project, and it is the responsibility of the project manager to manage them when they occur. These risks can be known or unknown. To manage them, the contingency reserve and management reserve will be used. These reserves are defined during the risk management planning process. The contingency reserve and management reserve will provide the project with a cushion against the risks and will form a part of the project budget.

Based on the perceived known risks, the contingency reserve applied to each work package is five percent (5%). This will form a part of the cost and performance measurement baseline. In consideration of the ministry organizational policies and the ability of this institution to manage projects, the management reserve usually fixed for projects is three percent (3%). It will form a part of the project budget but not of the cost baseline. The project manager will maintain control of the contingency reserves, while the project sponsor and project committee will grant permission for the use of the management reserve.

**Chart 17, Project Cost Estimates (Source: Gabriel Duvalsaint, the author, April 2021)**

| Intranet Development project | |
|---|---|
| Project Management | 58,580.00 |
| Product requirements | 1,400.00 |
| Analysis and Design | 2,950.00 |
| Development | 8,900.00 |
| Quality assurance | 2,200.00 |
| Training and Support | 6,250.00 |
| Implementation | 24,454.73 |
| Cost estimates | 104,734.73 |
| Contingency reserve(5%) | 5,236.74 |
| Cost baseline | 109,971.47 |
| Management Reserve(3%) | 3,299.14 |
| Total project budget | 113,270.61 |

### 4.4.4 Cost Control Procedure

During the implementation and execution of the intranet development project, procedures for control and recording will be implemented to indicate the progress that is associated with the project cost.

To do so, control costs, will allow the project stakeholders to manage the changes in the cost baseline. As a benefit, it will give them a way to determine different variances from the plan, particularly on the cost, so that they can take the appropriate corrective action to reduce the risks.

#### 4.4.4.1 Process Description and Importance

Controlling the cost of a project involves the tracking, measuring, and reporting of costs during the monitoring and controlling phases. Expenditures have to be monitored. Cost forecasts have to be prepared. The realized costs have to be compared against the cost baseline, and the changes to it must be managed using the change control process.

#### 4.4.4.2 Detailed Description of How the Project Budget is to be Controlled

The intranet development project is not a large and complex project. Only one scenario will be envisaged in the earned value management analysis. The scenario will analyze the project schedule, progress, and cost status at 50% of the budgeted cost and a duration of fifty-five (50) days. The project manager and team will calculate the planned value, actual cost, and earned value of the project within 50 days. If the results show an SPI of less than 1, it is a negative result, and it indicates that the project is behind schedule. The project manager should take corrective action, such as fast tracking or cost crashing to get the project back on track. If the CPI is more than 1, this also indicates that the project is spending less than what was planned for its current status.

Another metric that can be used to control the project budget is cost forecast calculation, which estimates the project costs at completion. With a CPI greater than 1 and if the cost continues with the same trend, the project manager can expect that the project will cost less than $113,270.61.

## 4.5. Quality Management Plan

### 4.5.1 Introduction

The quality management plan is the basic document for project quality. It is one of the several subordinate management plans within the project plan. The quality management plan can be defined as “a component of the project management plan that describes how applicable policies, procedures, and guidelines will be implemented to achieve the quality objectives. It describes the activities and resources necessary for the project management team to achieve the quality objectives set for the project” (PMI,2017, p. 286).

Project managers usually look for an existing template to apply as a starting point. Few templates like those exist. Quality management plans are more described than demonstrated in project management literature. Applying a template may not allow the consideration of the subtle aspects of a project that are inherently unique. It may be best for project teams to craft an individual quality management plan that fits the needs of the project, not just the format of a published template.

The quality management plan may be formal or informal, detailed, or broadly framed. The style and detail of the quality management plan are determined by the requirements of the project.

For the intranet development project, the quality management plan will include the following elements:

- Quality standards that will be used by the project
- Quality roles and responsibilities
- Key factors related to quality
- Metrics and a quality baseline
- Quality activity matrix
- Quality documents
- Continuous improvement plan

### 4.5.2 Quality Standards that Will Be Used by the Project

Standards may be viewed in two ways. In the traditional view, a standard is a prescribed way of doing something. Standards have also been viewed by some as explicit targets to be met or quantifiable definitions of generally stated requirements. Standards guide the project implementation. They describe how the project team should or must employ the processes. Many sources exist for consideration by the project team. Chart 18 below summarizes a list of standards that will be used in the quality management plan.

**Chart 18, International Quality Standards for the Intranet Development Project (Source: Tutorial Point Simply Easy Learning)**

| Standard | Specifications |
|---|---|
| ISO/IEC 9126 | This standard deals with following the aspects to determine the quality of a software application:<br>• Quality model<br>• External metrics<br>• Internal metrics<br>• Quality in use metrics<br>This standard presents some sets of quality attributes that are compatible with the requirements of the intranet development project, such as the following:<br>• Functionality<br>• Reliability<br>• Usability<br>• Efficiency<br>• Maintainability<br>• Portability |
| ISO/IEC 9241-11 | This standard deals with the extent to which a product can be used by specified users to achieve the specified goals with effectiveness, efficiency, and satisfaction in a specified context of use. |
| ISO/IEC 25000:2005 | ISO/IEC 25000:2005 is commonly known as the standard that provides the guidelines for the software quality requirements and evaluation (SQuaRE) |
| IEEE 1008 | A standard for unit testing |
| IEEE 1012 | A standard for software verification and validation |
| IEEE 12207 | A standard for software life cycle processes and life cycle data |
| BS 7925-2 | A standard for software component testing |

### 4.5.3 Quality Roles and Responsibilities

**Chart 19, Roles and Responsibilities for Quality Management (Source: Gabriel Duvalsaint, the author, April 2021)**

| Institution | Role | Responsibilities |
|---|---|---|
| World Bank | Sponsor | • Is responsible for the quality benefit<br>• Ensuring that the product yields their satisfaction and reduces the cost |
| Ministry of Economy and Finance (MEF) | Product owner and organizational management | • Is responsible for transmitting the vision, features, and module of the product to be created to the development team<br>• Is responsible for developing the quality system |
| Software development company (PLJ.inc) | Project team or scrum team (agile project) | • Is responsible for developing and delivering the product<br>• Is responsible for the project and product quality<br>• Is responsible for the quality control of the product, such as ensuring that all testing product evaluations are complete and correct |
| Contractors (suppliers) | Material and equipment providers | • Is responsible for providing quality materials for the development of the software, such as the operating system (license and computer software) and also the database management system (software and license) |
| Economic Division (suppliers-process-customer chain) | Project team | • Is responsible for the quality aspect of the project, such as ensuring the reliability of the data to enter to the system<br>• Is responsible for the quality control of the product by ensuring that the integration testing and interface testing are complete in the evaluation of the process |
| National community and international partners (end-users) | Final users | They are not part of the creation process directly, but they could be in the revision phase of the deliverables to improve the quality of the product. |

### 4.5.4 Key Factors Related to Quality

The key success factors related to quality are based on the requirement prioritization (L-Shaped matrix).

**Chart 20, Factors Related to Quality (Source: Gabriel Duvalsaint, the author, April 2021)**

| Factor | Factor definition |
|---|---|
| Ensuring that authorized users can get access to the database *(Reliability/Usability)* | To ensure that every user can get access to the database everywhere via the internet. The software department must require all licenses for the operating system and materials for data storage three weeks before the approved testing by the Economic Division. |
| Guaranteeing a highly secured intranet with high-speed access *(Integrity)* | Securing the access of the intranet software development should ensure that users are submitted to a double verification before logging into the system. All licenses required by the software department and connectivity test must be provided one week after the integration testing and interface testing. |
| Ensuring that the website is frequently updated with new data and frequently upgraded to assure the compatibility with new operating and data management systems. *(Efficiency/Interoperability)* | To complete the database and ensure the availability of the data for users, the Economic Division should prepare and provide data on a regular basis (weekly).<br>To avoid the loss of connectivity to the intranet and accessibility to the database, the application must be frequently upgraded.<br>All licenses and permits for the operating system and software should be renewed one month before the expiration date of the project. |

### 4.5.5 Metrics and Quality Baseline

The metrics and quality baseline establishes the detailed metrics and the way in which a product, project, service, or result of the project will be measured. The metrics are inputs for quality assurance (where it is validated that the processes will be able to achieve them) and for quality control (where the results are compared against the metrics to verify the compliance and define whether corrective actions are necessary).

**Chart 21, Metrics and Quality Baseline (Source: Gabriel Duvalsaint, the author, April 2021)**

| Quality objective | Metric | Metric definition | Expected outcome/result | Frequency | Responsible |
|---|---|---|---|---|---|
| To provide all functional specifications according to the requirement prioritization documentation . | Compliance with the specifications provided by the provider | Verifying the number of provided materials, licenses, and storage required in the functional specification documentation | To have all provided materials reviewed according to the documentation before implementing the intranet | One week after receiving the materials | The software development company |
| To provide a consolidated database to manage data | User and query conflicts | Number of users who can get access to the system and extract data | 30% of users have access to the database two weeks after implementing the database and 50% at the end of the month. | Daily basis | The software development company & Economic Division |
| | Query performance | Time taken to treat the queries and display the data | To limit the time taken to treat queries and display the data in less than two minutes per access | Daily basis | |
| To create an application that allows authenticated users to selectively manipulate the database | Compliance with architectural techniques selected in the documentation | Number of authenticated users accepted by the application | To integrate 75% of the authenticated users before the acceptance test by the ministry | One week after the implementation of the intranet | The software development company, Economic Division, and Ministry of Economy and Finance |
| To conceive an intranet that will centralize the access to data and publications from the Economic Studies Division (ESD) | Capacity | Performance issue related to the large number of data stored in the server | To test hardware and server specifications | Monthly basis | The software development company |

### 4.5.6 Quality Activity Matrix

The quality activity matrix establishes activities aimed at ensuring that quality objectives and metrics are met, and therefore, the requirements of the project.

**Chart 22, Quality Activity Matrix (Source: Gabriel Duvalsaint, the author, April 2021)**

| Deliverable | Requirement | Manage and control activities | Frequency | Responsible |
|---|---|---|---|---|
| Documentation | To provide the functional specification document to the World Bank at least 3 weeks after the final result of the procurement process | Manage:<br>Making a checklist to include all materials, equipment, and licenses provided by the contractor | To review the checklist one week after the reception | The software development company |
| | | Control:<br>Meeting with the team to review the checklist and verify if the provided materials meet all requirements | Once after receiving the materials, equipment, and software | The software development company, Economic Division, and ministry |

| | | | | |
|---|---|---|---|---|
| Analysis and conception documentation | Large and easy access to the database | Manage:<br>1-Checklist to verify if the list of requirements has been satisfied regarding the access to the database<br>2- Design for X to control the product's final characteristics<br>3- Using the guideline to optimize the reliability, usability, and safety | To review the checklist two weeks after the conception documentation has been submitted | The World Bank, Economic Division, and ministry |
| | | Control:<br>Meeting with the team to review the list of requirements and also to discuss what to incorporate to the ongoing project | To review the checklist two weeks before the implementation of the intranet | |
| Intranet implementation | To centralize the access to the data and publications from the Economic Studies | Manage:<br>1-Checklist to verify that a set of required steps has been performed<br>2- Process analysis to identify the opportunity for process improvement | To review the checklist on a regular basis during the deployment<br><br>One week before starting the testing | The software development company, Economic Division, and ministry |

| | | | | |
|---|---|---|---|---|
| | Division (ESD) | | phase | |
| | | Control:<br>1-Inspection to verify defects<br>2- Testing product evaluations to detect bugs in the intranet | Peer review Two weeks to verify the defects in the product Integration testing, interface testing, and black box two weeks before the final delivery of the application | |

### 4.5.7 Quality Documents

Quality documents that will be necessary to generate the project quality record for the intranet development project are the following:

- Check sheets for collecting data
- A flow chart
- An erroneous coding form for the control chart

The template above will allow the project team to track faults or errors through the phases of the project build.

### 4.5.7.1 Check Sheet Form for Collecting Data

| | Weekly Status of Report error check sheet-Development intranet Project | |
|---|---|---|
| Period cover | week 3- week 5 | |
| | Error Description | Number |
| | | |
| Material specification errors | | |
| Query errors | | |
| Authenticated users errors | | |
| Coding errors | | |
| Data transformation errors | | |

Figure 10 :Check Sheet Form for Collecting Data (Source: Gabriel Duvalsaint, the author, 2021)

### 4.5.7.2 Flow Chart of the Intranet Development Project for the Economic Division

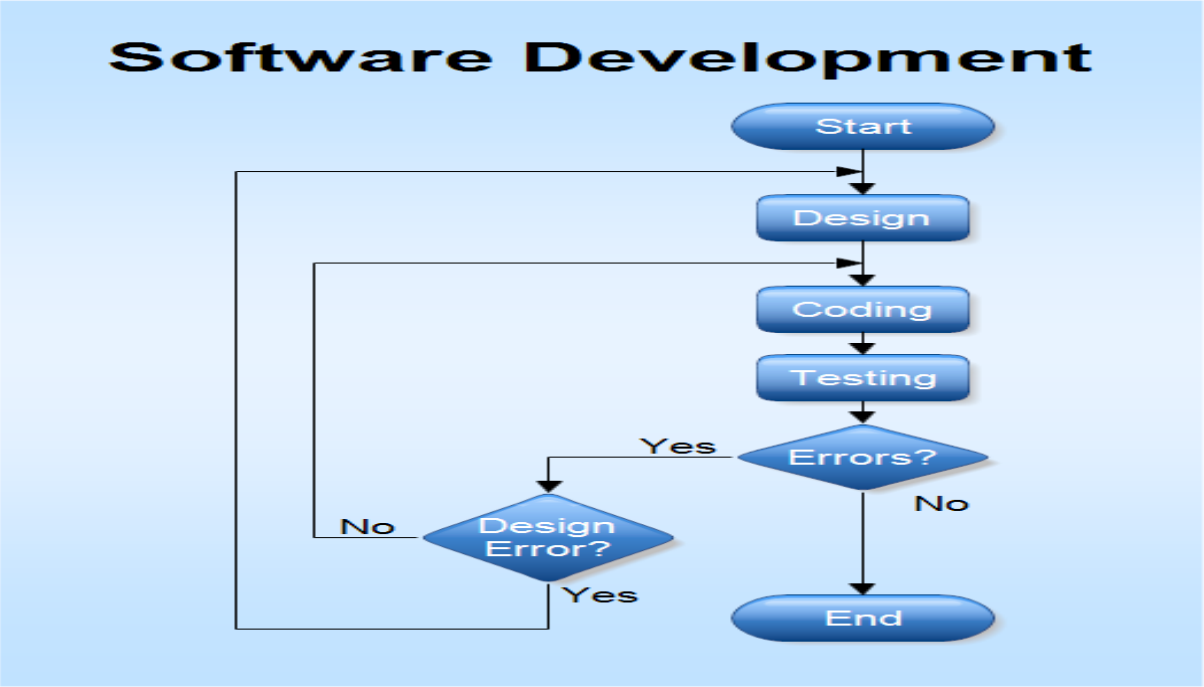



Figure 11 : Flow Chart of the Intranet Development Project for the Economic Division

(Source: Gabriel Duvalsaint, the author, 2021)

### 4.5.7.3 Erroneous Coding Form

| Erroneous Coding form | | | | | | |
|---|---|---|---|---|---|---|
| | programmer 1 | programmer 2 | programmer 3 | programmer 4 | Total | Average |
| | | | | | | |
| Monday | | | | | | |
| Tuesday | | | | | | |
| Wednesday | | | | | | |
| Thursday | | | | | | |
| Friday | | | | | | |
| Total | | | | | | |
| Average | | | | | | |

Figure 12 : Erroneous Coding Form (Source: Gabriel Duvalsaint, the author, 2021)

## 4.6 Resource Management Plan

### 4.6.1 Introduction

“Resource management is acquiring, allocating and managing the resources, such as individuals and their skills, finances, technology, materials, machinery and natural resources required for a project. Resource management ensures that internal and external resources are used effectively on time and to budget. Resources may be obtained internally from the host organization or procured from external sources” (The APM Body of Knowledge, paragraph 1).

The project manager must identify the resources required to deliver the work, as part of planning, and determine when the resources will be required, through scheduling. This forms an essential part of the project management plan.

“The resource management plan is the component of the project management plan that provides guidance on how project resources should be categorized, allocated, managed, and released” (PMI,2017 p. 318).

The main output produced as part of project resource management planning is a human resource plan, which includes a project organizational chart, responsibility assignment matrix, resource histogram, and staffing management plan.

### 4.6.2 Plan Resource Management

The management of the intranet development project staff will be the responsibility of the project manager. Performance evaluations, issues and recognition, and rewards and disciplinary actions will also be the responsibility of the project manager. The project manager will also collect project background information, such as the organizational chart, project risks, constraints, project charter, and project scope statement. The project manager will certainly design the planning sessions and also engage in the identification of key stakeholders who can assist in completing the resource management plan. During plan resource management, the project manager will define how to “estimate, acquire, manage, and utilize physical and team resources” (PMI,2017, p. 312) based on the project’s specific objectives.

#### 4.6.2.1 Project Organization Chart

Figure 13 illustrates the reporting structure for the intranet development project. It shows the overall project governance and lines of reporting, the internal stakeholders, and inter-relationships amongst them.

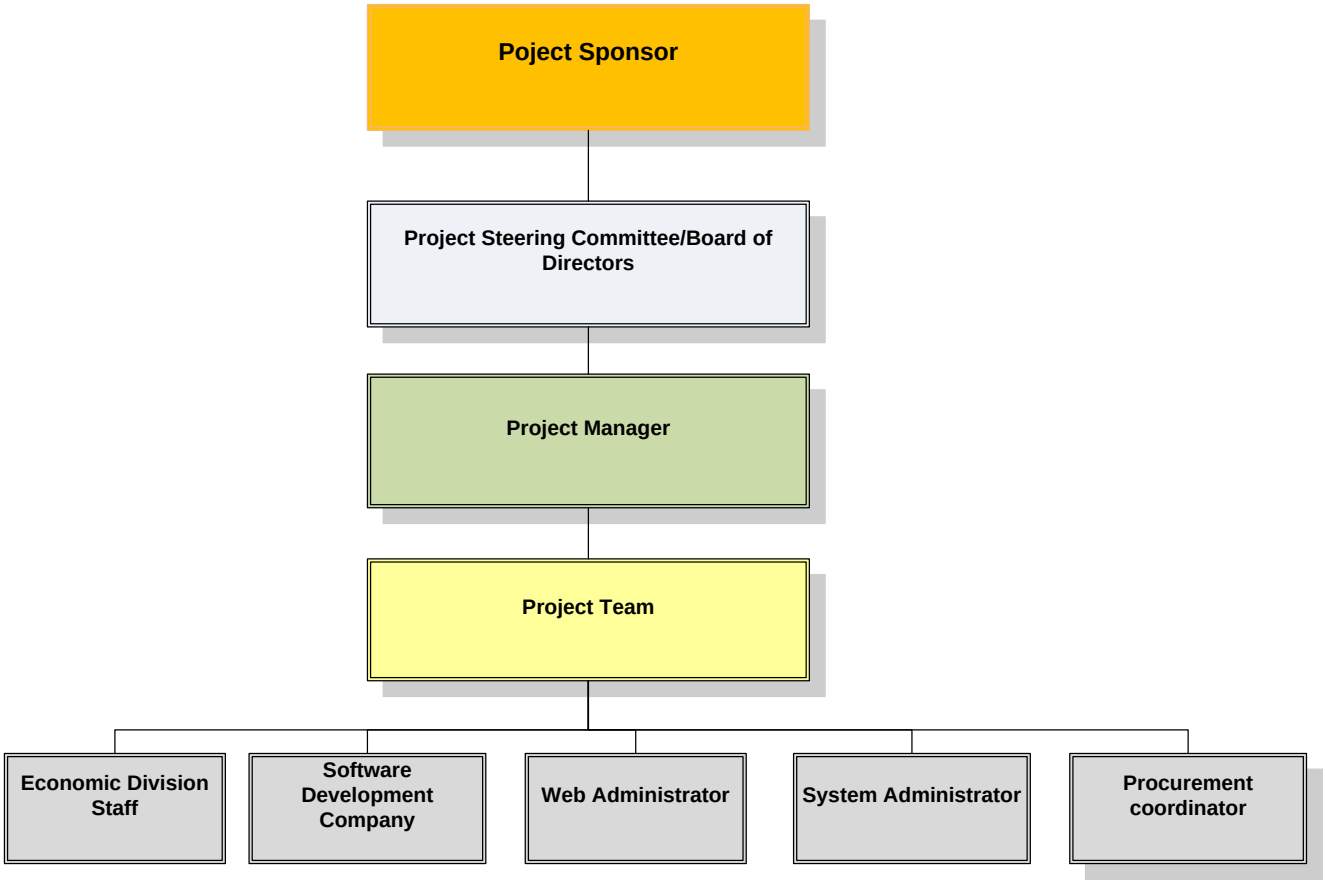



Figure 13 : Intranet Development Project's Organization Chart (Source: Gabriel Duvalsaint, the author, 2021)

### 4.6.2.2 Responsibility Assignment Matrix (RAM)

The responsibility assignment matrix is a type of technique used in planning resource management. A RAM shows the project resources that are assigned to each work package. It is used to illustrate the connections between work packages, or activities, and project team members. It can take the form of a matrix, which shows all activities associated with one person and all of the people associated with one activity. The most popular type of responsibility assignment matrix is the RACI (responsible, accountable, consult, and inform) chart. It is a useful tool to ensure the clear assignment of roles and responsibilities when the team consists of internal and external resources. Chart 23 below shows the RACI matrix for the intranet development project.

**Chart 23, Intranet Development Project RACI Chart (Source: Gabriel Duvalsaint, the author, April 2021)**

| RACI chart | PERSON | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Activity** | **Project sponsor** | **Project steering committee** | **Project manager** | **Economic Division staff** | **Software development company** | **Web administrator** | **System administrator** | **Procurement coordinator** |
| Recruitment team | I | R | A | I | I | I | I | I |
| Collecting requirements | C | I | A | C | R | C | C | I |
| Logical structure | I | I | C | I | R/A | I | I | I |
| Physical structure | I | I | C | I | R/A | I | I | I |
| Functional specifications | I | I | C | C | R/A | C | C | I |
| Technical specifications | I | I | C | C | R/A | C | C | I |
| Design review | I | I | C | C | R/A | C | C | I |
| Coding | I | I | I | I | R/A | C | C | I |
| Provider selection | I | C | A | C | I | I | I | R |
| Hardware/Software purchase | I | I | A | I | I | I | I | R |
| Implementation component | I | I | A | I | R | C | C | I |
| Hardware/Software integration | I | I | I | I | R/A | C | C | I |
| Application installation | I | I | A | I | R | C | C | I |
| Specification testing | I | I | A | R | A | I | I | I |
| Integration testing | I | I | A | I | R | C | C | I |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| User manual | I | I | A | I | R | I | I | I |
| Training | I | I | A | C | R | C | C | I |

**Key:**
R – Responsible for completing the work
A – Accountable for ensuring the task completion/sign off
C – Consult before decisions are made
I – Inform when an action/decision has been made

### 4.6.3 Estimate Activity Resources

Estimate activity resources is “the process of estimating team resources and the type and quantities of materials, equipment and supplies necessary to perform project work” (PMI,2017, p.320). The intranet development project will estimate resources using expert judgment in several meetings.

#### 4.6.3.1 Resource Histogram

A resource histogram is a column chart that shows the number of resources required for or assigned to a project over time. In planning project staffing needs, senior managers often create a resource histogram in which columns represent the number of people (or person-hours, if preferred) needed in each skill category.
The information from the resource calendar in the acquire resources section of this plan was used to construct a resource histogram, which is shown below.

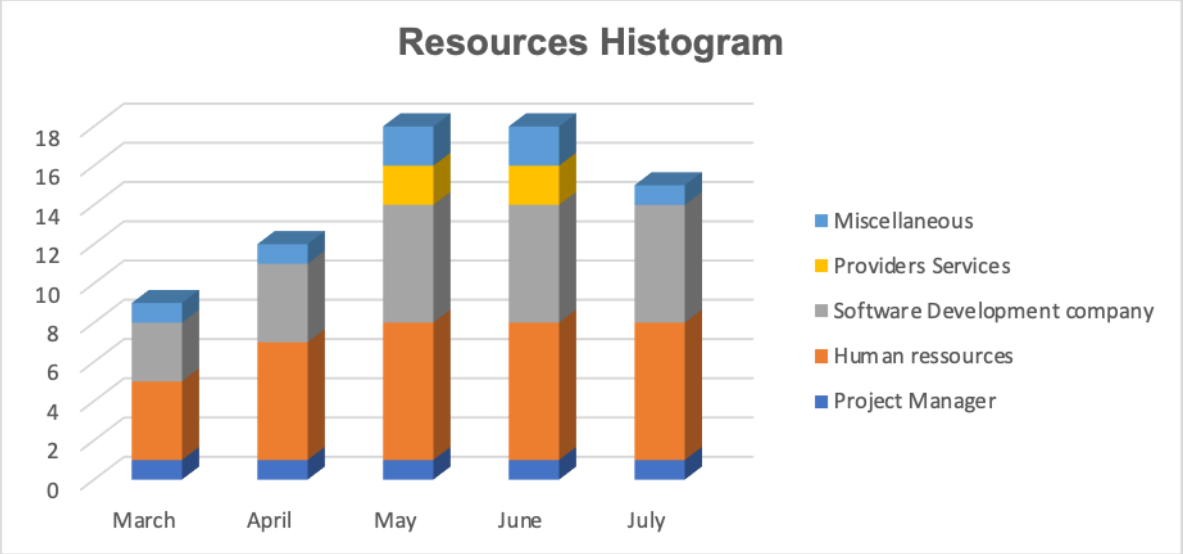



Figure 14 : Resource Histogram of the Intranet Development (Source: Gabriel Duvalsaint, the author, 2021)

The materials, supplies, and equipment required to complete the project are listed in the table below:

**Chart 24, List of Materials of for the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| Item | Quantity |
|---|---|
| Desktop | 5 |
| Laptop | 4 |
| Printer | 2 |
| Server | 2 |
| Paid software license | 2 |
| Free software license | 6 |
| Projector | 1 |
| Paper | 1 box |

### 4.6.4 Acquiring Resources

The resources needed for the intranet development project will be internal and external to the project-performing organization. Internal resources are acquired (assigned) from the functional department of the ministry. External resources are acquired through the procurement processes.

Project team management will have direct control over the resource selection. If the team resources are not available due to constraints, such as economic factors or the assignment to other projects in the ministry, the project manager or project team may be required to assign alternative resources.

As the intranet development project depends on the expertise of the software development company, the pre-assignment will be prioritized as techniques and tools for the intranet development project. The use of virtual teams will be promoted to save the expense of offices and all physical equipment needed for employees to move forward with projects and form teams of people who work different shifts, hours, or days.

The main output of this process will be the project team assignments. Chart 25 below will show the project team assignments for the intranet development project.

**Chart 25, Project Team Assignments for the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| Roles | Responsibilities | Skills/Proficiency |
|---|---|---|
| **Project manager** | • Making updates to the project management plan and project documents as necessary<br>• Completing the project document updates where applicable<br>• Reviewing and making decisions on change requests and ensuring that approved changes are implemented<br>• Performing data analysis based on the information gathered from the checklists administered by the procurement coordinator<br>• Selecting, leading, and motivating the project team from both internal and external stakeholder organizations<br>• Monitoring the work to make sure it is on time and within budget<br>• Co-ordinating the work of the project team and delegating tasks where appropriate | Leadership/ Management – 1<br>Budgeting – 1<br>Scheduling – 1<br>Executive communication – 1 |
| **Economic Division staff** | ● Helping the software development in collecting requirements<br>● Providing resources, such as internal data, external data sources, excel and csv files, to the software development company<br>● Helping the software company organize meetings with the main stakeholders<br>● Planning materials and equipment with the project manager<br>● Helping the procurement coordinator in the process of the providers' selection<br>● Preparing the inventory of materials allocated to the project | Time management - 2<br>Community engagement – 2<br>Intermediate level in information technology<br>Verbal communication-2<br>Writing communication -2 |
| **Software development company** | ● Collecting requirements<br>● Preparing the functional and technical specifications of the product<br>● Reviewing and coding the application<br>● Testing the application<br>● Preparing the list of materials, software, and equipment to be purchased by the procurement coordinator<br>● Helping the procurement department with the inspection of received materials<br>● Working with the project manager to prepare meetings with the project sponsor, board of directors, and other main stakeholders<br>● Preparing the user manual and technical reports of each project development phase<br>● Training the Economic Division staff on using the | Engineer or company with 5 years of experience in developing software<br>Engineer or company specialized in managing software projects |

| | | |
|---|---|---|
| | application | |
| **Web administrator** | ● Establishing web system specifications by analyzing the access, information, and security requirements and designing the system infrastructure<br>● Establishing the web system by planning and executing the selection, installation, configuration, and testing of the server hardware, software, and operating and system management systems and defining system and operational policies and procedures<br>● Maintaining the web system performance by performing system monitoring and analysis and performance tuning; troubleshooting system hardware, software, and operating and system management systems; designing and running system load/stress testing; and escalating application problems to the vendor | Web administration -1<br>Technical management -2<br>Telecommunication technologies -1<br>General programming skills -2<br>Internet technologies -1<br>Verbal communication -2 |
| **System administrator** | ● Setting up and maintaining user accounts<br>● Maintaining the system<br>● Verifying that peripherals are working properly<br>● Monitoring the system performance<br>● Creating file systems<br>● Installing the software | System administration -1<br>Technical management -2<br>Telecommunication technologies 1<br>General programming skills-2<br>Internet technologies-1<br>Verbal communication-2 |
| **Procurement coordinator** | ● Procuring the approved materials and equipment are in the required quantities<br>● Preparing the contract for the vendors on the day materials are ordered or on the day that goods are received<br>● Administration of procurement checklists, which gather data for analysis, by the project manager<br>● Initiating change requests | Procurement - 1<br>Effective communication - 1<br>Negotiation skills - 1<br>Time management - 1<br>Relationship management - 1 |

Proficiency key:

1 – Proficient

2 – Competent

3 – Learner

4 – Novice

### 4.6.4.1 Staff Acquisition Strategy

The project staff will be composed of internal and external staffs. The internal staff will be the employees of the Economic Division and Information Technology department, and they will be selected by their senior management after a short interview. These staffs will support the project, and they will receive a salary supplement. The project manager, suppliers, and software development company will be issued from a bidding process, and they will be paid by contract.

### 4.6.4.2 Resource Calendar

The intranet development project will last approximately five (5) months. It commenced on March 1, 2021, and it is scheduled to end on July 19, 2021. However, not all resources are available for the entire duration of the project. Chart 26 contains a resource calendar that provides an estimate of the resource number required per month for the project.

**Chart 26, Intranet development project Resources Calendar (Source: Gabriel Duvalsaint, The author, April 2021)**

| **Intranet development project resource calendar** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Resource** | **Start date** | **End date** | **Hours per month** | | | | | |
| | | | **March** | **April** | **May** | **June** | **July** | **Total** |
| Project manager | March 1, 2021 | July 19, 2021 | 40 | 40 | 40 | 40 | 40 | 200 |
| Economic Division staff | March 1, 2021 | July 19, 2021 | 40 | 40 | 40 | 40 | 40 | 200 |
| Software development company | March 12, 2021 | July 12, 2021 | 20 | 30 | 40 | 40 | 40 | 170 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Web administrator | March 12, 2021 | July 12, 2021 | 20 | 20 | 40 | 40 | 40 | 160 |
| System administrator | March 12, 2021 | July 12, 2021 | 20 | 20 | 40 | 40 | 40 | 160 |
| Procurement coordinator | April 30, 2021 | May 12, 2021 | 20 | 40 | 40 | 20 | 20 | 140 |

### 4.6.5 Developing the Team

Ensuring that the team begins to address the project work, technical decisions, and project management approach is very crucial for the success of this project. It will develop the ability of team to manage changes in almost all component of the project, to finish project work on time, to not overrun the project budget and improve the quality of the product.

Norming will be also used to ensure team members begin to work together and adjust their work habits and behaviors to support the team.

Colocation and virtual teams will be prioritized as techniques and tools for this project. Colocation will be used temporarily in the project, particularly in the testing phase of the project.

Virtual teams will be encouraged to use more skilled resources and reduced costs. Virtual teams will use technology to create an online team environment where the team can store files, use conversation threads to discuss issues, and keep a team calendar.

#### 4.6.5.1 Staff Training

Training includes all activities designed to enhance the competencies of the project team member. One part of the training for this project will be informal, such as on-the-job training from another project team member, mentoring, coaching, and technical skills. Another part of the training will be formal, and it is included in the

schedule management process as a milestone. Training costs are also included in the project budget.

#### 4.6.5.2 Performance Reviews

The project manager will evaluate and assess the performance of each project team member to determine how efficiently and effectively they are completing their assigned tasks on a bi-monthly basis. Thereafter, the project manager will provide feedback to each project staff and inform him/her of his/her performance during the period and the opportunities for improvement.

#### 4.6.5.3 Recognition and Rewards

The scope of this project does not allow for ample time to provide cross training, and it does not have the potential for monetary rewards. At the end of the project, there will be a closing ceremony during which all contributors will be thanked, and they will receive a certificate or plaque of appreciation based on their performances.

### 4.6.6 Managing the Team

Managing the project team is different from developing the project team. It involves the day-to-day management of people, which includes tracking their performance, providing feedback, resolving issues, and managing team changes to optimize the project performance. Team management involves a combination of skills with special emphasis on communication, conflict management, negotiation, and leadership.

Interpersonal conflicts among the project staff will be managed expeditiously and with tact. The project manager and human resource department of the ministry will establish ground rules. The rules will serve as guidelines to help the staff resolve some issues among themselves. However, when matters cannot be resolved and are escalated to the attention of the project manager, the following five (5)

resolution techniques are postulated by the PMBOK® Guide, 6th Edition, and each technique is used based on the situation that is faced:

1. Withdrawal/Avoid
2. Smooth/Accommodate
3. Compromise/Reconcile
4. Force/Direct
5. Collaborate/Solve the problem

### 4.6.7 Controlling Resources

Controlling resources is “the process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual utilization of resources and taking corrective action as necessary” (PMI, 2017, p. 352).

The project manager will control resources by providing oversight to the procurement and logistics processes to ensure the timely availability and distribution of the resources.

## 4.7 Communication Management Plan

### 4.7.1 Introduction

Planning communications is essential for the Project manager to handle communication related issues. it involves generating, collecting, disseminating, and storing project information. Key output of this process will be the communication management plan which is a document plan that describes how project communications will be planned, structured, monitored, and controlled.

The communications management plan will vary with the needs of the project, but some type of written plan should always be prepared and updated as needed. The plan should describe who will provide and receive data, when, and how the information will be presented. Stakeholders may change depending on the project phase, so the plan must be updated as needed.

The communications management plan of intranet development project will address the following items:

- Stakeholder communications requirements
- Information to be communicated, format, content, and level of detail
- Identification of who will receive the information and who will produce it
- Description of the frequency of communication
- Escalation procedures for resolving issues
- Revision procedures for updating the communications management plan
- Suggested methods or guidelines for conveying the information

The plan will include flow charts of the information flow for the project as well as communications constraints based on legislation, regulation, technology, or organizational policies. The communications management plan will also provide guidelines and templates for creating various project documents.

### 4.7.2 Communication Management Approach

The project manager will play a vital role in ensuring the effective communication on this project. The project manager will be responsible for managing all proposed and approved changes to the communication management plan consistent with the project's change management plan to ensure that all stakeholders are aware of any changes to the project's communication management.

The project manager will update the plan and supporting documentation and disseminate all updates to the project team and all stakeholders. More specifically, as a result of managing the communication, both the communication management plan and the stakeholder engagement plan may be updated. Also, updates may be made to the issue log, lessons learned register, project schedule, risk register, and stakeholder register. Additionally, the communication matrix will be used as the guide for what, who, when, how, and to whom to communicate. Work performance data contained in reports will be used in selecting the most appropriate communication tools and techniques based on the information that is provided.

### 4.7.3 Communication Management Constraints

The project manager should ensure that all communication activities are performed by the project team within the project's approved budget, schedule, and resource allocation. In addition, all communication activities will occur in accordance with the frequencies outlined in the communication matrix to ensure that the project adheres to the schedule constraints. Therefore, any deviation from these timelines may incur additional costs or delays in the schedule, which must be approved by the project committee.

The project manager will be responsible for ensuring that the approval is requested and obtained prior to the dissemination of any confidential information concerning the intranet development project.

### 4.7.4 Stakeholder Communication Requirements

The frequency and method of communication for each stakeholder will be determined by the project manager after identifying and conferring with the main project stakeholders according to the stakeholder register. Therefore, all project communication will be in accordance with the communication matrix. However, individual communication can be acceptable once it is within the project's communication constraints and depending on the stakeholder's communication needs.

Given the fact that the project has ten (10) stakeholders, using the communication channel formula N(N-1)/2, there are forty-five (45) communication channels. The communication matrix indicates how the communication will be disseminated across the channels. It will ensure that all stakeholders have the necessary access to receive project communication, especially via secured means or through the ministry's internal resources.

The project team will maintain and use the stakeholder register and the communication matrix as a basis for all communication once all stakeholders and their requirements are determined.

### 4.7.5 Project Team Directory

The project team directory presents the contact information for all stakeholders identified in this communication management plan. The email addresses and phone numbers in this table will be used to communicate as necessary.

**Chart 27, Intranet Development Project Team Directory (Source: Gabriel Duvalsaint, the author, April 2021)**

| Role | Name | Title | Organization/ Department | Email | Phone |
|---|---|---|---|---|---|
| Project sponsor | Javier Rodrigo | Program coordinator | World Bank | jrodrigo@worldbank.com | +1(202) 557 - 5414 |
| Project steering committee | Patrick Brutus | Minister | Ministry of Economy and Finances | Patrick.Brutus@mef. gouv.ht | (509) 3444 - 4455 |
| Project manager | Gabriel Santini | Director | Economic Division | gsantini@mef.gouv.ht | (509) 3417 - 2527 |
| Economic Division staff | Lucien Bazelais | Representative of the Economic Division team | Economic Division | lbazelais@mef.gouv.ht | (509) 4893 - 4948 |
| Software development company | Lys Pierre | Software engineer | LPJ Software Development Inc. | lyspjunior@gmail.com | (509) 3401 -1334 |
| Web administrator | Josue Francois | Web developer engineer | Information technology department of the ministry | jfrancois@mef.gouv.ht | (509) 3860-4320 |
| System administrator | Joseph Pierre | System developer engineer | Information technology department of the ministry | jpierre@mef.gouv.ht | (509) 4861 - 2211 |

| | | | | | |
|---|---|---|---|---|---|
| Procurement coordinator | Elysée Daniel | Senior procurement manager | Procurement unit of the ministry | edaniel@mef.gouv.ht | (509) 3417- 5312 |
| Representative | Maarten Vincent | Technical international partners | European Union | M.Vincent@eeas.europa.eu | (509) 2811 7277 |
| Representative | Frantz Lesage | Economic, financial, and statistical community | Independent consultant | Flesage@gmail.com | (509) 4823-1254 |

### 4.7.6 Communication Method and Technologies

The communication tools and techniques that will be used during this project to manage communication are various. The communication technology and methods include emails, Zoom virtual meetings, Microsoft Teams, telephone calls, and WhatsApp. The latter three (3) technologies are also examples of interactive communication, with WhatsApp also being an example of social computing communication. Additionally, push communication, such as reports and letters, will be used. Google Drive will be used to facilitate pull communication, where stakeholders can readily access information. Also, there will be both interpersonal and small group communication, as well as mass communication, such as press releases via www.mef.gouv.ht. See the communication matrix for more information.

Communication skills, including nonverbal, communication competence, feedback, and presentations, will be used for the project. The presentations will be shared using technology such as Google Docs, secured social networks, and emails.

Meetings will be held weekly via virtual platforms, such as Zoom and Microsoft Teams, and an agenda and invitation will be circulated via email at least two (2) days prior. Meetings will include feedback loops, such as a question-and-answer section to facilitate the feedback from participants. Furthermore, the project manager is responsible for ensuring the participation of the members, dealing with conflicts that arise during meetings, and following up on matters arising via telephone calls and WhatsApp.

### 4.7.7 Implementation of the Project Management Information System to Manage the Project

"Project Management Information System (PMIS) are system tools and techniques used in project management to deliver information. Project managers use the techniques and tools to collect, combine and distribute information through electronic and manual means. Project Management Information System (PMIS) is used by upper and lower management to communicate with each other".

The intranet development project will use an online PMIS. The benefits of using an online or cloud-based system are numerous. With an online information system, the speed, capacity, efficiency, economy, accuracy, and ability to handle the project can all be approved. With these factors, there is also a cost benefit. The cost advantage of a digital PMIS over a manual PMIS is usually significant, especially when considering storage and processing.

Given the project objectives, stakeholder information requirements, and level of resources available, a SharePoint platform will be used as a cloud-based PMIS to provide, update, and store project data, archive various reports, and conduct project communication. SharePoint is a web-based collaborative platform that is integrated with Microsoft Office. In a level 1 PMIS, the project manager will be responsible for acquiring and maintaining the licenses for the basic software and operating system.

Through online SharePoint, the project team can develop and add components of the project. Chart 28 below shows the PMIS components of the project.

**Chart 28, Program Management Information System Components (Source: Gabriel Duvalsaint, the author, April 2021)**

| PMIS component | Purpose |
|---|---|
| Project calendar | Storing project events, such as meetings, deadlines, and the resource availability |
| Project task | Storing the project task information, assignment, and status |
| Project risks | Storing the project risk information, priority, and status |
| Project contacts | Storing common project contacts |

| | |
|---|---|
| Project resources | Storing resource information skill sets and rates |
| Project documents | Storing relevant project documents, templates, checklists, and reports |
| Change request system | Storing change request information, decisions, and actions |
| Project announcements | Storing relevant project announcements |
| Project milestones | Storing project milestone information with baseline dates and actual dates |

### 4.7.8 Communication Flow Chart

The communication flow chart provides a visual representation of how information should be distributed between the intranet development project stakeholders.

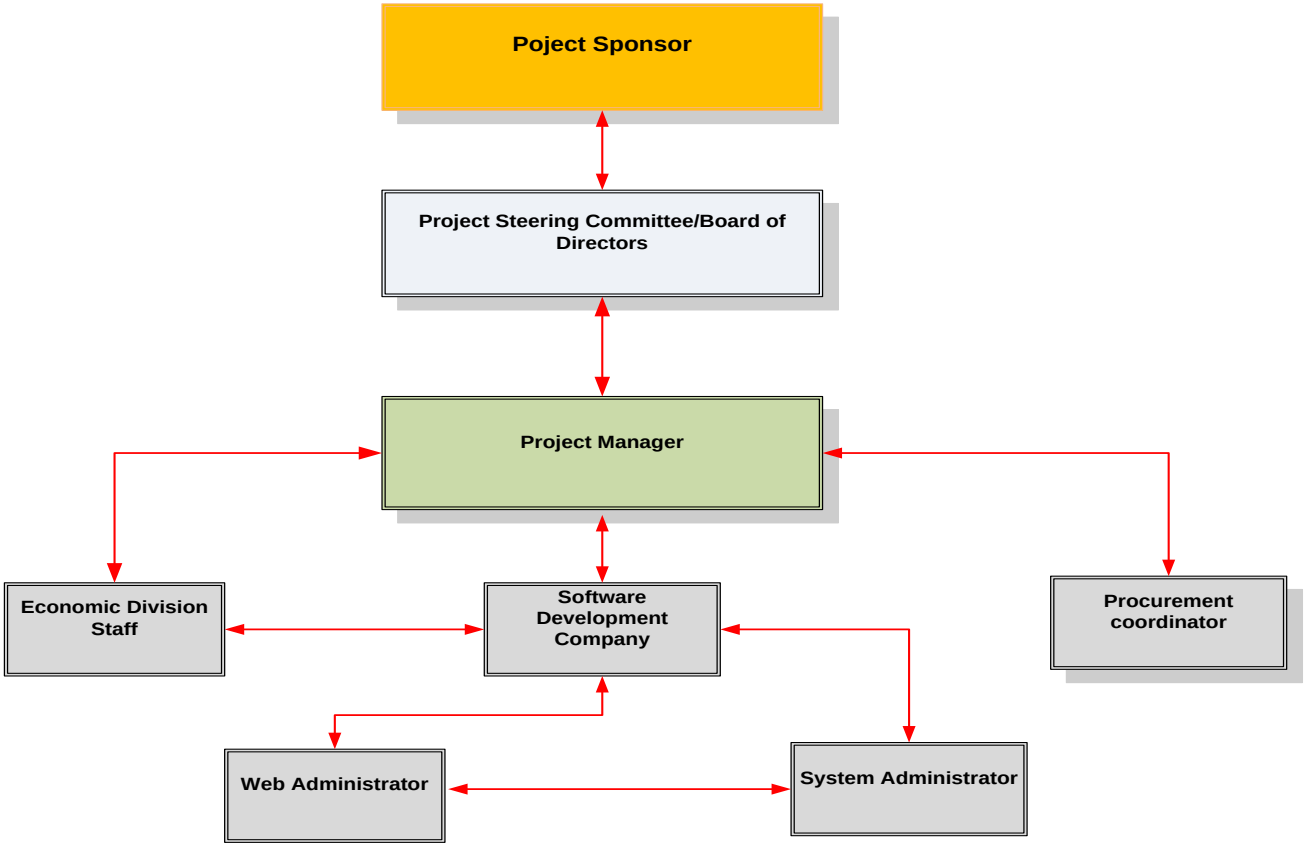



Figure 15 : Communication Flow Chart (Source: Gabriel Duvalsaint, the author, 2021)

### 4.7.9 Communication Matrix

The communication matrix summarizes the following elements: the various stakeholders, the communication that is required, the communication delivery method or format, who will carry out the communication, and when it will be distributed or the distribution frequency.

As more communication items are defined, they will be added to this list. The project team will use various templates and checklists to enhance the communication.

Chart 29 displays the communication matrix for the intranet development project.

**Chart 29, Communication Matrix for the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| Communication type | Objective | Medium | Frequency | Audience | Deliverable | Format |
|---|---|---|---|---|---|---|
| Kickoff meeting | To introduce the project team and review the management approach and project objectives | Zoom virtual meetings | Once | The project team, software development company, and representatives | Agenda and meeting minutes | Soft copy archived on Google Drive or sent by email |
| Project team meetings | To review the status of the project with the team | Zoom virtual meetings | Weekly | The project team | Agenda and meeting minutes | Soft copy archived on Google Drive or sent by email |
| Monthly project status meetings | To report to management on the status of the project | Zoom virtual meetings | Monthly | The project team, project steering committee, and project sponsor | The agenda, meeting minutes, project schedule, and project cost | Soft copy archived on Google Drive or sent by email |

| | | | | | | |
|---|---|---|---|---|---|---|
| Press releases | To report to the public on the progress of the project | The web and social networks | At the end of the project | The representative, scientific community, and university | Press releases | Soft copy |

### 4.7.10 Communication Standards

Templates will be used to guide the drafting of agendas, meeting minutes, letters, press releases, project reports, and presentations. Overall, using templates will help to facilitate a consistent and effective communication.

### 4.7.11 Communication Escalation Process

The project will have a formal communication escalation process to help minimize the impact of disputes among project team members. This will help to ensure that there is minimal disruption to the schedule and budget. Chart 30 below presents the escalation matrix for the intranet development project.

**Chart 30, Escalation Matrix of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| Priority | Definition | Decision authority | Timeframe for resolution |
|---|---|---|---|
| **Priority 1** | Disputes can have significant impact with detrimental effects on the schedule and budget. | Board of directors | Within 2 hours |
| **Priority 2** | Disputes can have a moderate impact on the schedule and budget. | Project manager | Within 24 hours |
| **Priority 3** | Disputes can pose challenges to the schedule without impacting the budget. | Project manager | Within 48 hours |
| **Priority 4** | It is a minor impact to the project, | Project manager | Within 36 hours |

| | | | |
|---|---|---|---|
| | but if it is left unresolved, it can create further challenges. | | |

### 4.7.12 Monitoring Communication

Monitoring communication is “the process of ensuring the information needs of the project and its stakeholders are met” (PMI, 2017, p. 388).

Control management is where information has to flow as planned, in the right way, to the right people, and at the right time. The project manager will take the lead role in ensuring the effective communication on this project.

Monitoring communication may require a variety of methods. Team observations and reviewing data from the issue log will be used for this project.

The project management information systems described above contain information that can serve as an important tool to effectively control information in the project.

## 4.8 Risk Management Plan

### 4.8.1 Introduction

A risk management plan is a subset of the project management plan that outlines how risk management will be performed on a particular project. A risk management plan documents the procedures for managing risks throughout the life of a project.

The general topics that a risk management plan should address include the methodology for risk management, roles and responsibilities, budget and schedule estimates for risk-related activities, risk categories, probability and impact matrices, and risk documentation.

### 4.8.2 Risk Categorization and Prioritization

Risks should be identified before being categorized and prioritized. Identifying risks is the process of identifying individual project risks as well as sources of the overall project risk and documenting their characteristics (PMI,2017, p.409). Risk identification is the most important step in the risk management process because risks that are not found cannot be dealt with.

The project manager and team will identify the risks of the project. All risks identified in the intranet development project will be documented.

The following methods will be used to assist in the identification of risks that are associated with the project:

1. Subject matter expert interviews
2. Risk assessment meetings
3. Checklist
4. SWOT (strengths, weaknesses, opportunities, and threats)

Once the potential risks are identified, the next step for the project team is to categorize them for management ease and control. The risks of the intranet development project will be categorized as follows:

1. Technical
2. External
3. Operational
4. Project management

A risk breakdown structure (RBS) will be used to structure risk categories. This hierarchal outlook will assist the project team to properly analyze the potential risks that threaten the project. Decomposition techniques will expose the actual risks that may occur under each category. Figure 16 below will show the RBS for the intranet development project.

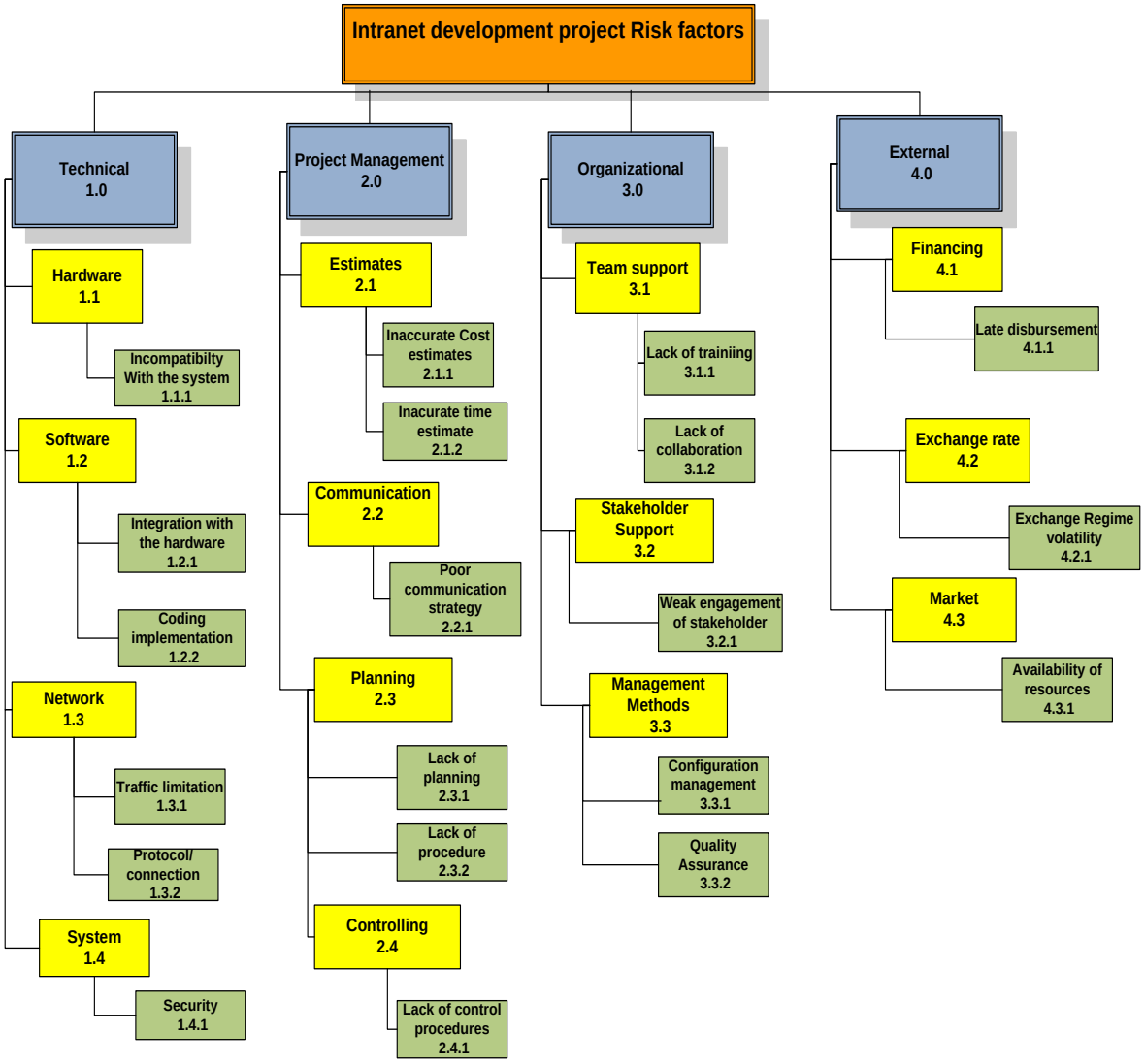



**Figure 16 : Risk Breakdown Structure of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, 2021)**

### 4.8.3 Probability and Impact Scales

Once the risk identification process of intranet development project was completed, the project team will use a qualitative risk analysis process to understand the likelihood (probability) and consequence (severity or impact) of each risk event.

The first factor that determine the risk of a project is the probability. It ranges from 0% to 100%. It is relatively easy to determine what the impact of a risk will mean

for the project objectives. Rating the probability can be a bit more difficult though because of subjectivity and lack experience. For the intranet development project the probability of impact will be subjectively estimated by the project team with a help of consult expert. As the Ministry has no rating scale defined, the project team decide on a simple probability scale as detailed in chart 31.

**Chart 31, Risk Probability Scales of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| **Risk probability scales** | |
|---|---|
| **Description** | **Ranking** |
| Event with an extremely high likelihood of occurring during the life cycle | 5 |
| Event with a high probability to occur during the life cycle | 4 |
| Event that may occur during the life cycle | 3 |
| Event that will most likely not occur during the life cycle | 2 |
| Event that is not expected to happen during the life cycle | 1 |

Definition of Impact Assessment

The impact of risk events on different project objectives can be defined in both a qualitative and quantitative manner. The impact scale can vary, but the most common scale is the five-point scale.

Chart 32 below shows how the impact can be defined for various objectives. The possible impacts on each objective are described and given a ranking. The ranking

is both relative, from insignificant to unacceptable, and numerical, giving a numerical value assessment.

**Chart 32, Impact Probability Scales of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| **Impact probability scales** | |
|---|---|
| **Description** | **Ranking** |
| Jeopardized project purpose and need | 5 |
| Unacceptable change in scope | 4 |
| Significant changes in the project scope are necessary. | 3 |
| Changes in the project scope are necessary. | 2 |
| Insignificant changes in the project scope | 1 |

### 4.8.4 Probability and Impact Matrix

The probability and impact matrix is one the most commonly used qualitative assessment methods. It is based on the two risk components, the probability of occurrence, and impact on the objective(s) if it occurs. The matrix is a two-dimensional grid that maps the likelihood of the risks' occurrence and their effect on the project objectives. The risk score, often referred to as risk level or degree of risk, is calculated by multiplying the two axes of the matrix.

Risk = Impact x Probability

| **Probability** | **Threats** | | | | | **Opportunities** | | | | | **Probability** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **5** | 5 | 10 | 15 | 20 | 25 | 25 | 20 | 15 | 10 | 5 | **5** |
| **4** | 4 | 8 | 12 | 16 | 20 | 20 | 16 | 12 | 8 | 4 | **4** |
| **3** | 3 | 6 | 9 | 12 | 15 | 15 | 12 | 9 | 6 | 3 | **3** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2** | 2 | 4 | 6 | 8 | 10 | 10 | 8 | 6 | 4 | 2 | **2** |
| **1** | 1 | 2 | 3 | 4 | 5 | 5 | 4 | 3 | 2 | 1 | **1** |
| | **1** | **2** | **3** | **4** | **5** | **5** | **4** | **3** | **2** | **1** | |
| | **Impact (Threats)** | | | | | **Impact (Opportunities)** | | | | | |

**Figure 17 : Probability and Impact Matrix of the Intranet Development Project**
**(Source: Gabriel Duvalsaint, the author, 2021)**

| | | | |
|---|---|---|---|
| From 15 to 25 | | **Red** | **Mitigate** |
| From 7 to 14 | | **Yellow** | **Avoid** |
| From 1 to 6 | | **Green** | **Accept** |

Green: The risks that are characterized as green have both a low impact and less likelihood of occurrence. For negative risks/ threats, the required response is not necessarily a proactive management action. However, they should be included within the risk register for future monitoring. Positive risks/opportunities within the green category should be monitored or just simply accepted. Opportunity acceptance means taking advantage of the opportunity if it arises but not actively pursuing it.

**Yellow:** The risks that are characterized as yellow have the moderate category. The characterization is dependent on the organization's defined threshold and mostly due to the uncertainties of numerous elements that individually. These are such uncertainties as the actual cost and duration of different project aspects and changes to activate or other similar uncertainties that, alone, have little impact. The probabilities must be estimated subjectively. The most common responses include having insurance or mitigation strategies in place.

**Red:** The risks that are characterized as red have both a high impact and high likelihood of occurrence. A risk that has a negative impact is a threat to the objective that may need priority actions and aggressive responses. These aggressive responses could be risk mitigation or even terminating the project if the risk is too

high. A risk that has a positive impact is an opportunity. It is most likely obtained easily with the greatest benefits and should thus be targeted first.

### 4.8.5 Risk Register

The risk register captures details of the identified individual project risks. The results of performing the qualitative risk analysis, planning risk responses, implementing risk responses, and monitoring risks are recorded in the risk register, as those processes are conducted throughout the project. The risk register may contain limited or extensive risk information depending on the project variables, such as size and complexity. (PMI, 2017, p. 417).

The register of the intranet project development will include the following:

1) A list of identified risks
2) Potential risk owners
3) A list of potential risk responses
4) Risk root causes
5) Risk strategies
6) Estimated risk costs

**Chart 33, Risk Register of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

## Intranet Development Project Risk Register

| RBS code | Cause | Risk | Consequence | Probability | Impact | PxI | Trigger | Owner | Strategy | Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.1.1 | The hardware designs for one operating system may not work for another. | Incompatibility with the system | Delays to the project and higher development costs<br><br>The ministry may end up extending the time by one more week.<br><br>The ministry may be charged for the material change and shipping. | 3 | 5 | 15 | The device or kernel drivers are unavailable or the hardware may not run at its highest stated performance. | Software development company | **Mitigate:** The project team will deal with the threats or opportunities as they occur. A workaround plan will be put in place and implemented if the event occurs. | US$ 800 |
| 1.2.1 | Inaccurate data edits or glitches in out-of-date installed programs | Integration with the hardware | Delays to the project and higher costs of development | 3 | 5 | 15 | Peripheral commands interpreted incorrectly<br><br>Computers are freezing constantly. | Software development company | **Mitigate:** Bringing IT or specialist support onboard early in the process<br><br>Obtaining technical consultancy and support from qualified system architects and engineers | US$ 2000 |
| 1.2.2 | Absence of quality coding standards<br><br>Misunderstanding of the stakeholders' requirements<br><br>Inadequate version of the software and unpaid license for the software | Coding implementation | Delays to the project and undermining the product quality<br><br>It can generate failure and appraisal costs. | 3 | 5 | 15 | Failure to access the database and integrate data<br><br>Failure to authenticate a user<br><br>Failure to connect to the intranet and visualize personal information | Software development company | **Mitigate:** The project manager and software development engineer need to work on a plan to continuously reduce bugs. This plan will contain some elements of prevention, such as test-driven development, continuous integration, specification, etc. | US$ 1000 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inadequate testing | | | | | | | | | |
| 1.3.1 | Underestimated network capacity<br><br>More users than expected at any point in time | Traffic capacity | It will generate additional costs, and the product quality will be undermined. | 2 | 5 | 10 | Failure to integrate more users in the system<br><br>The application slowing down frequently | Web administrator and system administrator | **Avoid:** The system administrator should monitor and analyze network key performance indicators and end-user response times by acquiring the real-time network visibility tool, which quickly detects application and bandwidth issues. | US$ 4,000 |
| 1.4.1 | Growing internet connectivity of computers and networks and the corresponding user dependence on network-enabled services (such as e-mail and web-based transactions)<br><br>Degree to which systems accept updates and extensions | Security system | It will generate a prevention cost to the project and budget | 4 | 5 | 20 | The system constantly crashes.<br><br>Malicious intruders and the malicious code and botnets compromise systems by exploiting software defects. | System administrator | **Mitigate:** Incorporating security practices during the development process<br><br>Developing a defensive plan for the various sources of insecurities identified during the intranet development project process | US$ 5,000 |
| 2.1.1 | Inadequate tools and techniques used to estimate the costs of activities<br><br>Underestimated reserve contingency | Inaccurate cost estimates | Budget overrun | 3 | 5 | 15 | The cost performance indicator (CPI) is less than 1 in performing the quarterly earned value management. | Project manager | **Mitigate:** Developing a corrective plan to bring CPI to be greater than 1 in the next quarter<br><br>This plan will include meetings with the experts and project sponsor to review the cost estimates and budget. | US$ 300 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Absence of expert judgment in estimating the cost of each activity<br><br>Inaccurate assumptions made in the unit cost of resources to compute the cost basis estimates | | | | | | | | | |
| 2.1.2 | Inadequate tools and techniques used to schedule activities<br><br>Underestimated reserve contingency<br><br>Absence of expert judgment in estimating the time for each activity | Inaccurate time estimates | Delays to the project | 3 | 5 | 15 | The schedule performance indicator (SPI) is less than 1 in performing the quarterly earned value management. | Project manager | **Mitigate:** Developing a corrective plan to bring SPI to be greater than 1 in the next quarter<br><br>This plan will include meetings with the experts and project team to review the schedule management plan. | $300 |
| 2.2.1 | Lack of use of the communication tools<br><br>Lack of understanding of the communication | Poor communication strategy | The project can go in unmanageable directions.<br><br>It can undermine the quality of the product.<br><br>It can generate an additional cost for the training. | 2 | 5 | 10 | Sharing sensitive information with non-designated stakeholders<br><br>The transmission of information does not follow the protocol | Project manager | **Mitigate:** Developing a training plan for the staff that helps them master the latest information technology tools<br><br>Creating a safe space for communication | $1000 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | method and techniques<br><br>Misunderstanding of the project management information system | | | | | | described by the project manager.<br><br>The information does not follow the format described in the communication matrix | | Holding frequent meetings with the project staff on communication standards, protocols, constraints and escalations | |
| 2.3.1 | Lack of understanding of the project management techniques | Lack of planning | The increase of costs, decrease of quality, and increase of time | 2 | 5 | 10 | Unrealistic or unarticulated project goals<br><br>Inaccurate estimates of needed resources<br><br>Poor reporting of the project's status<br><br>Lack of resources | Project manager | **Mitigate:**<br>Developing a backup plan to support senior management and the project team in planning project activities<br><br>Organizing meetings with experts to help the team develop tools and techniques to provide better activity estimates, make quality tests, etc.<br><br>Building an online library of project management documents that helps the team and staff in project management | $1500.00 |
| 2.3.2 | Absence of an organizational process asset<br><br>Absence of primary procedure documentation | Lack of procedures | Delays to the project | 2 | 5 | 10 | Time taken for activity disbursement<br><br>Time taken for allocating resources<br><br>Time taken for signing contracts and procuring resources for the project<br><br>Unbalanced cash treasury | Project manager/Project steering committee | **Mitigate:** Developing different types of manual of procedures by using an analogous project | $ 750.00 |

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| 2.4.1 | Absence of an organizational process asset<br><br>Absence of primary control documentation | Lack of a control mechanism | Delays to the project and the decrease of quality | 2 | 5 | 10 | Poor test reporting<br><br>Poor audit reporting<br><br>Failure to conduct inspection tests | Project manager/Project steering committee | **Mitigate:** Performing audits regularly according to the procedures of the project sponsor<br><br>Developing a manual to perform inspections | $ 1000.00 |
| 3.1.1 | Absence of training development for human resources<br><br>Absence of a career development plan | Lack of training support | The increase of costs, decrease of quality, and increase of time | | | 10 | Difficulty to manage the available project tools<br><br>Failure to test the product<br><br>Failure to use the final product | Project manager/Software development company | **Mitigate**: Creating a career development that contains a training plan for human resources | $ 2500.00 |
| 3.1.2 | Insufficient time dedicated to the forming and norming phases<br><br>Mismanagement of conflicts<br><br>Lack of leadership | Lack of team collaboration/ cooperation | The decrease of quality and increase of time | 2 | 5 | 10 | Time taken to respond to the project requests<br><br>Number of absences in project meetings | Project manager | **Mitigate**: Improving the quality of the project manager and senior staff to efficiently manage conflicts<br><br>The project manager should improve the leadership, negotiation, and delegation to effectively manage the project. | $0.00 |
| 3.2.1 | Misunderstanding the interests, influence, and powers of the stakeholders | Weak stakeholder engagement | The decrease of quality and increase of time | 3 | 5 | 15 | Excessive absence of stakeholders in meetings<br><br>Absence of | Project manager | **Mitigate:** Development of a stakeholder engagement plan that defines the roles and responsibilities of each stakeholder | |

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|---|---|---|---|---|---|---|---|---|---|---|
| | Lack of knowledge of the number of stakeholders | | | | | | stakeholders' feedback after each phase of the project development | | The project manager needs to plan and delegate the tasks of each stakeholder<br><br>Holding meetings to ensure stakeholders' requirements are understood and taken into consideration in the project | $500.00 |
| 3.3.1 | Initiating the project without clarifying the requirement specifications<br><br>Responding to continuous specification changes | Configuration management | The increase of costs, decrease of quality, and increase of time<br><br>It may have an impact in the project scope. | 3 | 5 | 15 | Frequent requests to change the product design<br><br>Significant modification of the requirements | Project manager/Software development company | **Mitigate:** Developing an efficient configuration system to carefully manage and keep track of configuration changes to ensure traceability and reduce cybersecurity risks | $ 3000.00 |
| 3.3.2 | Lack of planned systematic activities to determine if the project performance meets the quality requirements | Quality assurance | The increase of costs and decrease of quality | 2 | 5 | 10 | Absence of quality standards in implementing the project<br><br>Increase in the percentage of code writing per week | Project manager | **Mitigate:** Developing a quality assurance plan that documents all activities and allows effective management | |
| 4.1.1 | Lack of a planning disbursement<br><br>Absence of an accounting and financial system<br><br>Lack of a financial audit | Late disbursement | The increase of time, cost, and budget | 2 | 5 | | The disbursement occurs two (2) weeks after the approval. | Project manager/Project sponsor | **Mitigate:** Developing a monthly engagement plan and a cash treasury plan that anticipates the future disbursement of the project | $ 300.00 |

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| | | | | | | | | | | |
| 4.2.1 | Increase of the product price in the international market<br><br>Local monetary policy | Exchange rate regime volatility | The increase of the cost and budget | 1 | 5 | 5 | Deviation to the cost baseline due to the exchange rate being greater than 5% | Project manager | **Accept:** Weekly monitoring and controlling the project cost performance<br><br>Monitoring and controlling the price in the international market | $500.00 |
| 4.3.1 | Lack of a resource management plan<br><br>Weak procurement management | Availability of resources | The increase of the time, cost, and budget | 2 | 5 | 10 | The time to provide materials exceeds the planned contingency reserve. | Project manager/Procurement coordinator | **Mitigate:** Weekly monitoring and controlling the project resources<br><br>Proactive procurement management to anticipate delays, identify new markets, and manage the availability of resources | $ 1000.00 |

**Total cost US$ 25,450.00**

## 4.9 Procurement Management Plan

### 4.9.1 Introduction

Project procurement management includes “the processes to purchase or acquire the products, services, or results needed from outside the project team to perform the work, as well as the contract management and change control processes to administer any contract issued by authorized project team members, by the performing organization (normally the seller), or the outside organization (normally the buyer)” (Government Extension to PMBOK@ Guide, Third Edition, PMI p. 71).

Project procurement management includes three (3) processes:

1-Plan procurement management: "The process of documenting project procurement decisions, specifying the approach, and identifying potential sellers”.

2 Conduct procurements: "The process of obtaining seller responses, selecting a seller, and awarding a contract”.

3 Control procurements: "The process of managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate, and closing out contracts”.

The procurement management plan, which is the output of planning procurement, contains the activities to be undertaken during the procurement process. It is a document that describes how the procurement processes will be managed, from developing the documentation for making outside purchases or acquisitions to the contract closure.

The procurement management plan will serve as a guide for managing procurement throughout the life of the project and will be updated as acquisition needs change. This plan identifies and defines the items to be procured, types of contracts to be used in support of this project, the contract approval process, and decision criteria. The importance of coordinating procurement activities and establishing firm contract deliverables and metrics in measuring procurement activities is included. Other items included in the procurement management plan include procurement risks and procurement risk management considerations, how

costs will be determined, how standard procurement documentation will be used, and procurement constraints.

### 4.9.2 Procurement Management Approach

For the intranet development project, the project manager will ensure that the plan facilitates the successful completion of the project and does not become an overwhelming task in itself to manage. The project manager will work with the procurement coordinator, project team, contracts/purchasing department, and other key players to manage the procurement activities.

The project manager will provide oversight and management for all procurement activities under this project. The project manager will work with the project team to identify all items to be procured for the successful completion of the project. The unit of project programming and coordinating will then review the procurement list prior to submitting it to the contracts and purchasing department. The contracts and purchasing department will review the procurement items, determine whether it is advantageous to make or buy the items, and begin the vendor selection, purchasing, and contracting process.

### 4.9.3 Procurement Definition

The purpose of procurement definition is to describe, in specific terms, what items will be procured and under what conditions. This section will also list individuals with authority to approve purchases in addition to or in the absence of the project manager.

The following procurement items and/or services have been determined to be essential for the project completion and success.

**Chart 34, Procurement Items/Services of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| Item/Service | Description | Justification | Needed By |
|---|---|---|---|
| Hardware: server | HP ProLiant DL360p Gen8 High Performance - Xeon E5-2650 2 GHz - 32 Go - 0 Go. | Needed for implementing the database, application, and intranet. We do not | June 3, 2021 |

| | | | |
|---|---|---|---|
| | Processor: 2 x Intel Xeon E5-2650 / 2 GHz (2.8 GHz) (8 core) Memory: 40 Mo L3<br>Storage: RAID (SATA 6Gb/s / SAS 6Gb/s) - PCI Express 3.0 x8 (Smart Array P420i)<br>RAM: 32 Go) / 384 Go (maximum) - DDR3 SDRAM - 1600 MHz - PC3-12800<br>HDD: 1 To | make this item. | |
| Software | Windows Server 2012, Enterprise Edition<br>Microsoft SQL Server 2012, Enterprise Edition | Needed for implementing the database, application, and intranet<br>We do not make this item. | May 7, 2021 |
| Laptop | HP 15-inch, intel(R) core (TM) i5 8265U CPU@1.60 Ghz 1.80 Ghz<br>RAM 12.0 GB<br>System type: 64-byte operating system, HDD 250 GB | Needed for coding and testing the product and working remotely<br>We do not make this item. | May 10, 2021-June 3, 2021 |
| Desktop | XPS: 10th Gen Intel® Core™ i7-10700 processor (8-Core, 16M Cache, 2.9GHz to 4.8GHz)<br>Windows 10 Home, 64-bit, English<br>16GB, 2x8GB, DDR4, 2933Mhz, 1TB 7200RPM 3.5" SATA HDD | Needed for collecting data, making daily works, and getting access to the intranet application<br>We do not make this item. | May 10, 2021-June 3, 2021 |
| Printer | Lexmark MX910de Laser Printer – Multifunction, Monochrome Laser, Duplex (2-sided) Printing: Integrated Duplex, Print speed: Up to 45 ppm, Recommended monthly Page volume: 15000 - 50000 pages | Needed for printing the documents of meeting minutes, reports, user manuals, etc.<br>We do not make this item. | May 10, 2021-June 3, 2021 |

| | | | |
|---|---|---|---|
| Projector | Epson EpiqVision Mini EF11 Laser Projector, 3LCD, Portable, Full HD 1080p, 1000 lumens color brightness and white brightness, compatible with Roku, FireTV, Chromecast, Playstation, and Xbox | Needed for projecting the product's evolution and making visual presentations for the team and stakeholders<br><br>We do not make this item. | May 10, 2021-June 3, 2021 |
| Paper | Format letter: 8.5"x11"<br>Legal format: 8.5"x14" | Needed for printing hard copies of meeting, reports, user manuals, and the agenda<br>We do not make this item. | March 1, 2021 |
| Service | Implementation of the product by the software development company | Needed for transferring data to the database and getting access to the new intranet of the ministry<br>This product will be made locally by a selected company. | March 10, 2021 |

In addition to the above list of procurement items, the project manager, procurement coordinator, and the minister are authorized to approve purchases for the project team.

### 4.9.4 Timetable of Key Procurement Activities

Figure 18 describes the procurement schedule of the intranet development project.

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | 1.5 Equipement and Materials | 0 days | Sun 4/11/21 | Sun 4/11/21 |
| 2 | 1.5.1 Create purchase order and purchase equipment | 3 days? | Mon 5/3/21 | Wed 5/5/21 |
| 3 | 1.5.3 Create purchase order and purchase software | 1 day? | Thu 5/6/21 | Thu 5/6/21 |
| 4 | 1.5.2 Acquire software license | 1 day? | Fri 5/7/21 | Fri 5/7/21 |
| 5 | 1.5.3 Prepare and ship equipment to the Ministry | 17 days? | Mon 5/10/21 | Tue 6/1/21 |
| 6 | 1.5.4 Received equipment form supplier | 1 day? | Thu 6/3/21 | Thu 6/3/21 |

**Figure 18 : Procurement Schedule of the Intranet Development Project**
**(Source: Gabriel Duvalsaint, the author, 2021)**

### 4.9.5 Type of Contract to be used

All items and services to be procured for this project will be solicited under firm fixed price contracts. The project team and procurement coordinator will work with the contracts and purchasing department to define the item types, quantities, services, and required delivery dates. The contracts and purchasing department will then solicit bids from various vendors to procure the items within the required time frame and at a reasonable cost under the firm fixed price contract once the vendor is selected.

Chart 35 will specify the contract issued for the software development company. All other project staff are taken in charge by the ministry through its monthly payroll process.

**Chart 35, Issued Contract of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| | **Type of contract** | **Reason** |
|---|---|---|
| Software development company | Firm fixed price contracts (FFP) | Once the contract is signed, the company in charge to complete the work would be expected to do so within a specified time frame. This will effectively prevent the cost from increasing over time. Consequently, all additional costs would be in charge of the seller. Thus, the seller would first have a clear understanding of the work plan and then prepare the course of action necessary to complete the task. |

### 4.9.6 Procurement Risks

All procurement activities carry some potential for risk that must be managed to ensure the project success. While all risks will be managed in accordance with the project's risk management plan, there are specific risks that pertain specifically to procurement that must be considered:

- Unrealistic schedule and cost expectations for vendors
- Conflicts with the current contracts and vendor relationships
- Configuration management for upgrades and improvements of the purchased technology
- Potential delays in shipping and impacts on the cost and schedule
- Questionable past performance for vendors

The technology may not be available, or it may increase in price at the time of purchase.

These risks are not all-inclusive, and the standard risk management process of identifying, documenting, analyzing, mitigating, and managing risks will be used.

### 4.9.7 Estimates and Evaluation Criteria

For procurement seeking goods and/or services from an outside vendor, costs are usually provided in response to a request for quote (RFQ), request for proposal (RFP), or a request for bid (RFB). Vendors submit quotes, proposals, or bids that describe the costs of the good or service in detail to aid the customer in their decision making. Costs are almost always used as part of the procurement decision criteria, but they may be prioritized differently depending on the organization.

For this project, we will issue a request for proposal (RFP) in order to solicit proposals from various vendors that describe how they will meet our requirements and the cost of doing so and a request for quotation (RFQ) to solicit various informational material from potential sellers. All proposals will include vendor support for items from the procurement definition as well as the base costs. The vendors will outline how the work will be accomplished, who will perform the work,

vendors' experience in providing these goods, customer testimonials, backgrounds and resumes of the employees performing the work, and a line-item breakdown of all costs involved. Additionally, the vendors will be required to submit work breakdown structures (WBSs) and work schedules to show their understanding of the work to be performed and their ability to meet the project schedule.

All information must be included in each proposal, as the proposals will be used as the foundation of our selection criteria. Proposals that omit solicited information or contain incomplete information will be discarded from consideration.

### 4.9.8 Standardized Procurement Documentation

Standardization makes work across all project process areas easier to manage. When organizations utilize standard forms, templates, and formats, there is a commonality across different projects as well as different groups within the organization.

This project will use standard documentation for all steps of the procurement management process to simplify tasks. These standard documents provide adequate levels of detail that allow for the easier comparison of proposals, more accurate pricing, more detailed responses, and more effective management of contracts and vendors.

The following standard documents will be used for project procurement activities:

Seller background

- Proposal process and timelines
- Proposal guidelines
- Source selection criteria
- Pricing forms
- Statement of work on the contract
- Terms and conditions
- Procurement performance evaluation form
- Selection evaluation criteria forms

### 4.9.9 Control of Contracts

The contract documents should clearly define the following:

a) The scope of the work to be performed

b) The goods to be supplied

c) The definitions of the contract terms

d) The language and laws of the contract

e) The conciliation and arbitration chamber

f) The functions and authority of the contract administrator

g) Information on the contract scheduling, contract quality control, contract cost control, and payments

h) Liquidated damages and bonus clauses

i) Force majeure

### 4.9.10 Selection of Suppliers

Suppliers will be selected based on the rating score in terms of price and delivery speed for the material and equipment. For services, suppliers will be evaluated on the rating score in terms of the technical offer and financial offer.

**Chart 36, Selection Matrix Template of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| **Supplier** | **Price (40%)** | **Delivery speed (60%)** |
|---|---|---|
| Supplier 1 | | |
| Supplier 2 | | |
| Supplier 3 | | |

The supplier with the highest score at the end of the exercise will receive the contract to undertake the given task.

**Contract Award**

1. The emerging supplier will be notified via letter or email.

2. The supplier must respond to this notification in two (2) working days.

3. The contract will be signed by the project sponsor and the potential seller during a face-to-face meeting. Witnesses for both parties should also be present at the meeting.

### 4.9.11 Performance Metrics for Procurement Activities

Metrics may be used to ensure that the project stays on schedule regarding the procurement activities. They may also be used to compile data on the performance of various vendors in order to assist with future procurement activities' vendor selection criteria.

The following metrics are established for the vendor performance for this project's procurement activities. Each metric is rated on a 1-3 scale as indicated below:

**Chart 37, Performance Metrics for Procurement Activities (Source: Gabriel Duvalsaint, the author, April 2021)**

| Vendor | Product quality | On-Time delivery | Documentation quality | Development costs | Development time | Cost per unit | Transactional efficiency |
|---|---|---|---|---|---|---|---|
| Vendor #1 | | | | | | | |
| Vendor #2 | | | | | | | |
| Vendor #3 | | | | | | | |

1 – Unsatisfactory
2 – Acceptable
3 – Exceptional

In addition to rating each vendor, actual values will be noted in order to build a past-performance database for selecting vendors for future procurement activities.

### 4.9.12 Inspection and Verification of Deliverables

The project team will use the contract statement of work to verify and inspect the deliverables. Once it meets the requirements, an approval will be granted, and the seller will be able proceed to acquire the payment.

### 4.9.13 Payment Systems

A seller will first have to submit invoices for the work that was carried out. Upon the verification and satisfaction of the provided work, the project manager will authorize the financial and accounting department to issue the payment via check. The software company will be paid via bank transfer, and it should sign a receipt after receiving the money. The use of checks and receipts will help the project track all payments and maintain proper accounting. A payment system of that nature will also provide control mechanisms, therefore assisting in tracking the deliverables that have been done.

### 4.9.14 Closing of Acquisitions

1. All contracts must be closed.
2. The verification of the deliverable(s) to the scope of work must be conducted.
3. Sign off contract between the seller and project sponsor
4. Submittal of the seller performance reports by the project team
5. The project manager will document the process as well as the lessons learned for future use.

## 4.10 Stakeholder Management Plan

### 4.10.1 Introduction

Every project will have stakeholders who are impacted by or can impact the project in a positive or negative way. The ability of the project manager to identify and manage these stakeholders in an appropriate way can mean the difference between project success and failure.

Project stakeholder management planning includes the processes required to:

- Identify the people, groups, or organizations that could impact or be impacted by the project.
- Analyze stakeholder expectations and their impact on the project.
- Develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

The main outputs of this process are a stakeholder engagement plan and project document updates.

### 4.10.2 Identifying Stakeholders

Identifying stakeholders is the process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on the project success (PMI,2017, p.507). It is very critical to identify all stakeholders early; to analyze their levels of interest, expectations, importance, and influence; and developing a strategy for maximizing their positive influences and mitigating potential negative impacts.

Identifying stakeholders is a repeated process, and it should be performed at the start of each phase and when a significant change in the project or organization occurs. Each time the identification process is repeated, the project management plan components and project documents should be consulted to identify relevant project stakeholders. One important output of this process is the stakeholder register, which includes, but is not limited to, the identification information, assessment information, and stakeholder classification.

### 4.10.3 Identification of the Stakeholders' Approach

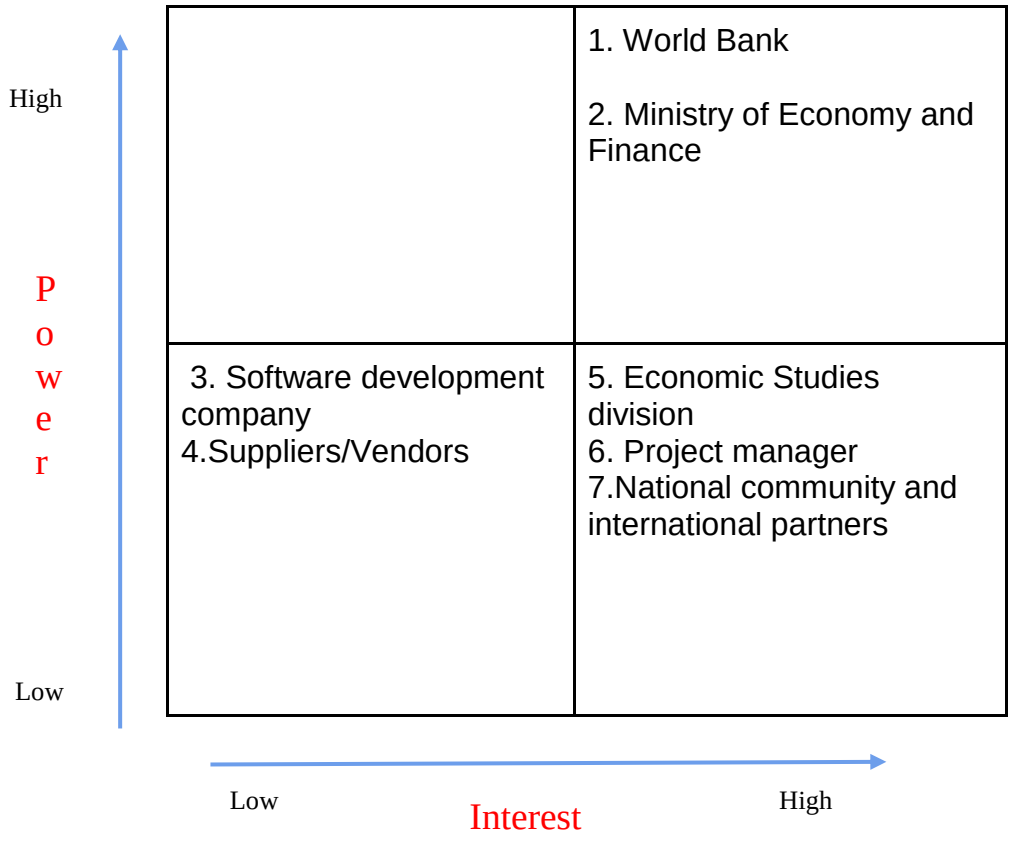
For the intranet development project, the project manager and project team will use one-on-one reviews, meetings, and focus group sessions to gather maximum information. This information will serve to make a stakeholder analysis that represents an important part of the stakeholder register. Once the stakeholder analysis is finished, the project manager will categorize the stakeholders by using a power-interest grid.

Chart 38 and 39 will respectively present the stakeholder register matrix and the power-interest grid.

**Chart 38, Stakeholder Matrix of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| | Stakeholders | Role | Impact (low, medium, or high) | Interest (low, medium, or high) | Power (low, medium, or high) | Influence (low, medium, or high) |
|---|---|---|---|---|---|---|
| 1 | World Bank (WB) | Project sponsor | High | High | High | High |
| 2 | Ministry of Economy and Finances (MEF) | Project owner | Medium | High | High | High |
| 3 | Software development company SDC | Software engineering/ Contractor | High | Medium | Low | High |
| 4 | Suppliers/vendors | Subcontractors | Low | Medium | Low | Low |
| 5 | Economic Studies division (ESD) | Project team | Medium | High | Low | High |
| 6 | Gabriel Santini | Project manager | High | High | Low | Low |
| 7 | National community and international partners | End users | Low | High | Low | Low |

**Chart 39, Stakeholder Power-Interest Grid of Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**




### 4.10.4 Planning Stakeholder Engagement

The first version of the stakeholder engagement plan will be developed after the initial stakeholder community has been identified and assigned a level which help to shape the stakeholder communication strategy of the project.

The stakeholder engagement matrix will be the analytic techniques used to compare the current stakeholder engagement levels and the desired engagement levels that are required for the successful project delivery.

The stakeholder engagement level can be classified as the following:

- Unaware: Unaware of the project and potential impacts
- Resistant: Aware of the project and potential impacts and resistant to change
- Neutral: Aware of the project yet neither supportive nor resistant

- Supportive: Aware of the project and potential impacts and supportive of the changes
- Leading: Aware of the project and potential impacts and actively engaged in ensuring that the project is a success.

Chart 40 below will present the stakeholder engagement assessment matrix for the intranet project.

**Chart 40, Stakeholder Engagement Assessment Matrix of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| Stakeholder | Unaware | Resistant | Neutral | Supportive | Leading |
|---|---|---|---|---|---|
| World Bank | | | | | C |
| Ministry of Economy and Finances | | | | | C |
| Software development company | | | | C | D |
| Suppliers/Vendors | | | C | | |
| Economic Studies division | | | | C | D |
| Project manager | | | | | C |
| National community and international partners | C | | | D | |

C represents the current engagement level of each stakeholder.
D indicates the level that the project team has assessed as essential to ensure the project success (desired).

The gap between the current and desired engagement levels for each stakeholder will direct the level of communication necessary to effectively engage the stakeholders. The closing of this gap between the current and desired levels is an essential element of monitoring stakeholder engagement.

Chart 41 below presents the stakeholder communication strategy to close the gap between the current and desired engagement.

**Chart 41, Stakeholder Communication Strategy of the Intranet Development Project (Source: Gabriel Duvalsaint, the author, April 2021)**

| Stakeholder | Type | Project phase | Communication Method | Strategy |
|---|---|---|---|---|
| World Bank | Internal | Initiating<br>Planning<br>Closing | Phone<br>Email<br>Virtual platform meetings<br>Face-to-face meetings | Keep it satisfied.<br>Ensure the sponsor requirements are carried out.<br>Any deviation is to be communicated before proceeding. |
| Ministry of Economy and Finances | Internal | Initiating<br>Planning<br>Closing | Phone<br>Email<br>Virtual platform meetings<br>Face-to-face meetings | Keep it satisfied.<br>Ensure the owner requirements are carried out.<br>Any deviation is to be communicated before proceeding. |
| Software development company | Internal | Executing<br>Closing | Phone<br>Email<br>Virtual platform meetings<br>Face-to-face meetings<br>Social media | Monitor it.<br>Touch base with it timely and ensure there will not be any problem. |
| Suppliers/Vendors | External | Executing | Phone<br>Email<br>Virtual platform meetings | Monitor them.<br>Touch base with them timely and not too often. |
| Economic Studies division | Internal | Initiating<br>Planning<br>Executing<br>Closing | Phone<br>Email<br>Virtual platform meetings<br>Face-to-face meetings | Keep them adequately informed.<br>Make sure no issues arise. |

| | | | | |
|---|---|---|---|---|
| | | | Social media | |
| Project manager | Internal | Initiating<br>Planning<br>Executing<br>Closing | Phone<br>Email<br>Virtual platform meetings<br>Face-to-face meetings<br>Social media | Keep him satisfied and informed.<br>Monitor and manage him closely. |
| National community and international partners | External | Executing<br>Closing | Email<br>Virtual platform meetings | Keep them adequately informed.<br>Make sure no issues arise. |

## CONCLUSIONS

1. For the intranet development project, the project management plan was created using the analytical research method and tools and the sixth edition of the PMBOK® Guide.
2. The project charter was the first subsidiary plan of the project management plan, created as the deliverable for specific objective number one. Templates were used as a guide to describe the organization background and organize the business needs and objectives, project description, preliminary scope statement, initial project risks, project deliverables, summary milestones, and project budget. The project charter also included the identification of the project manager and the sponsor's authorization for the project to initiate.
3. To define and specify the scope of the project, the scope management plan, the deliverable created for specific objective number two, along with the WBS, WBS dictionary, requirement management plan, requirement document, and requirement traceability matrix, were developed from a table or template, capturing the information gathered during the meetings with the project stakeholders and from project document reviews.
4. To manage the timely completion of project, the schedule management plan, which is the specific objective number three, was created, along with the activity list, schedule network diagram, resource assignment table and project Gantt chart, in order to adequately identify and orchestrate each project activity to ensure the project's completion within the time constraints.
5. To create the cost management plan, the output from specific objective number four, a template in Microsoft Excel, was used to adequately develop the project budget, and a template was used to capture the cost management plan, which will guide the development of the cost management performance measures and documents such as the cost baseline and project funding requirements.
6. The quality management plan, the output from specific objective number five, was created to identify the project's quality management approach, requirements/standards, quality assurance and control that will be used throughout the project to ensure that quality is built into the project's processes and products.

7. To address specific objective number six, the resource management plan, all resources required to complete the project were identified and classified in a comprehensive list. In addition, the project organization chart, the staffing management approach, and details identifying how the human resources will be managed throughout the project were detailed in the plan.

8. The communication management plan, the output of specific objective number seven, was created along with the major audience list and communication matrix ensuring that the means of sharing information at the right time, format, and person are properly outlined for the duration of the project.

9. The deliverable for specific objective number eight, the risk management plan, was created using a template. Additionally, to capture and classify project risks so that effective risk responses could be planned, a risk register was developed along with a qualitative risk analysis. A quantitative risk analysis was not performed during this process, as the tools were not available for use.

10. The procurement management plan deliverable, created for specific objective nine, was developed using a template to identify the project's procurement management approach, types of contracts used, and contract approval process. The plan is comprehensive in that it also details procurement risks and constraints and how these issues, along with vendors, will be managed effectively.

11. The stakeholder management plan, the output of specific objective number nine, was developed outlining project stakeholders, their classification, management, and engagement during the project's lifecycle.

12. Due to the fact that the intranet development project is a small project with a limited human resource capability, the project manager developed all subsidiary plans for the project. Templates, tables, spreadsheets, and about 41 charts were developed, used, and applied specifically to this project by aligning them with the current activities, but they can also be applied to other future projects. Meetings were conducted with key members of the project, reviewing meeting minutes, policy documents, just to name a few.

13. Without the implementation of project management practices, the project can suffer in terms of resources, time, quality, and budget because of

unrealistic expectations, poor methodology, poor requirements, inadequate resources, poor communication, and unrealistic budgets. The project manager has to carefully balance the elements of the project. The necessary and suitable project management knowledge areas and their tools and techniques will ensure that the project manager executes this project effectively.

## RECOMMENDATIONS

Developing a project management plan for the creation of the intranet development project was a passionate and exciting exercise. After having gone through this exercise, the following recommendations are being proposed:

1. The Ministry of Finance should use the intranet development plan as a basis to prepare project management plans for other types of projects.
2. The ministry should always use sound project management techniques in pursuit of any project, no matter the size. Subsequently, the project management plan, along with the other subsidiary plans, must always be formulated and documented.
3. A proper communication strategy is necessary to maintain the project success. The project manager must therefore possess managerial and leadership skills to create an environment where the team works in a friendly way and when issues or conflicts arise, they can be solved without placing the project in jeopardy.
4. Due to the nature and objective of the intranet project, the project manager should ensure that quality remains as a high priority. If the final product fails to meet the satisfaction of the intended customer, the ministry will not be able to capitalize on it to find future funding to execute new projects.
5. Human resources remain vital for this kind of project. The resource management plan proved to be a valuable document that provided an outline of the human capital necessary to conduct the project. It was recognized for a project of such magnitude that it is imperative to acquire people with advanced skills in networking, web administration, and any other skills required for the project.
6. As the project team is composed of the Economic Division and software development staff, special attention must be placed by the project team, as it relates to maintaining strict budget measures. Deviations from the streamlined budget can undermine the project by threatening other areas, such as time, scope, and quality.
7. The software company and project manager should arrange training processes for staff members and professionals in charge of project management to develop

technical and professional knowledge in the subject of project management. This is expected for the staff to be more effective in project planning and overall management.

8. The project manager should ensure a complete closing of the project by returning the staff to their normal activities, ensuring the transfer of the application to the Economic Division, submitting sensitive documents to the board and sponsor, and closing the software development company contract.

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## APPENDICES

Appendix 1: FGP Charter

| **PROJECT CHARTER**<br>**It formalizes the project start and confers the project manager with the authority to assign company resources to the project activities. Benefits: it provides a clear start and well-defined project boundaries.** | |
|---|---|
| **Date** | **Project name:** |
| Issue date:<br>26-Oct-20 | Project Management Plan for the Development of an Intranet Project for the Economic Division in the Ministry of Economy and Finance |
| **Knowledge areas / Processes** | **Application area (sector / activity)** |
| **Knowledge areas:**<br>Project integration management, project scope management, project stakeholder management, project schedule management, project cost management, project quality management, project resource management, project communication management, project risk management, and project procurement management<br>**Process groups:**<br>Initiating and planning | Information technology |
| **Start date** | **Finish date** |
| 26-Oct-20 | 23-Apr-21 |
| **Project objectives (general and specific)** | |
| General objective:<br>To create a project management plan using the practice standards and frameworks of the Project Management Institute (PMI) for an intranet development project for the Economic Division of the Ministry of Economy and Finance in order to collect, analyze, manage, store, and publish economic and financial data in their website<br><br>Specific objectives:<br>1.To develop a project charter that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities<br>2.To formally authorize the existence of a project and provide the project manager with the authority to apply organizational resources to project activities by creating a scope management plan<br>3.To develop a stakeholder management plan to identify stakeholders and develop strategies to effectively engage them<br>4.To manage the timely completion of the intranet project by developing a schedule management plan<br>5.To create a cost management plan to ensure that the project can be completed within the approved budget<br>6.To develop a quality management plan to ensure that the project will satisfy the stated or implied needs for which it was undertaken<br>7.To create a resource management plan to identify and manage materials and human resources for the successful completion of the project<br>8.To develop a communication management plan to ensure the timely and effective communication of the project performance and other key information<br>9.To develop a risk management plan to identify and prioritize risks in the project and develop a risk response plan<br>10.To develop a procurement management plan to purchase products and services needed from outside the project team | |

## Project purpose or justification (merit and expected results)

The purpose of this final graduation project (FGP) consists of creating a project management plan that will be very helpful for the project planning and execution in order to increase its probability of success. The ministry has project unity, which is very skillful in monitoring social and economic projects, but it does not have experience in planning information system projects.

The creation and use of the project management plan will provide the opportunity to better define the project objectives, quality metrics, milestones, success criteria, resource allocation, budget, and all components needed to ensure the project success. Given that this is the ministry's first experience in managing information technology projects, the project management plan will become an organizational asset for the ministry that can be used as a framework for future projects in other domains.

The intranet development project is very crucial for the ministry and national and international community as the final users of the product. It should be carefully planned to meet the needs of the scientific community, which needs data for doing their jobs in situ or remotely.

## Description of product or service to be generated by the project – project final deliverables

The project final deliverable will be the project management plan, which contains all subsidiary documents related to it. The specific deliverables associated with each specific objective include the following:

1.Project charter
2. Scope management plan
3. Stakeholder management plan
4. Schedule management plan
5. Cost management plan
6.Quality management plan
7. Resource management plan
8. Communication management plan
9. Risk management plan
10-Procurement management plan

## Assumptions

The project scope will not change.
The project can be completed in 3 months.
Feedbacks and reviews will be made on a timely manner.
Sufficient support from the University for International Cooperation (UCI) to complete the execution of the final graduation project
The main stakeholders for the project will remain in their current position.

## Constraints

Balancing work and time requirements for the project
Home internet connection trouble
Rotational movement of the project staff

## Preliminary risks

Cause and effect impact
Political instability changes the scope of the project time, cost, and quality
A second wave of Covid-19 delays in submitting the product's overall project scope and time
Several changes in the requirements
An inadequate support of UCI delays in submitting the FGP scope, time, and quality
The failure to make reviews delays in submitting the FGP time and quality in a timely manner
Inadequate access to product quality and poor performance review quality, time, and cost

## Budget

$US 879. It includes the additional cost for upgrading the home internet connection and buying a new printer and software license. It is not corresponding to the budget for developing the intranet project.

## Milestones and dates

| Milestone | Start date | End date |
|---|---|---|
| Final graduation project (FGP) | 26-Oct-20 | 23-Apr-21 |
| FGP start | 26-Oct-20 | 26-Oct-20 |
| **Graduation seminar** | **26-Oct-20** | **27-Nov-20** |
| **FGP deliverables** | **26-Oct-20** | **20-Nov-20** |
| FGP charter | 26-Oct-20 | 30-Oct-20 |
| FGP work breakdown structure (FGP WBS) | 26-Oct-20 | 30-Oct-20 |
| Chapter I: Introduction Chapter | 2-Nov-20 | 6-Nov-20 |
| FGP schedule | 2-Nov-20 | 6-Nov-20 |
| Chapter II: Theoretical Framework | 9-Nov-20 | 13-Nov-20 |
| Bibliography, indexes, and annexes | 16-Nov-20 | 20-Nov-20 |
| Chapter III: Methodological Framework | 16-Nov-20 | 20-Nov-20 |
| Executive summary | 23-Nov-20 | 20-Nov-20 |
| **Approved graduation seminar** | **23-Nov-20** | **27-Nov-20** |
| **Tutoring process** | **30-Nov-20** | **26-Feb-21** |
| Tutor | 30-Nov-20 | 2-Dec-20 |
| Adjustments of previous Chapters | 3-Dec-20 | 9-Dec-20 |
| **Chapter IV: Development** | **10-Dec-20** | **12-Feb-21** |
| Project charter | 10-Dec-20 | 16-Dec-20 |
| Scope and stakeholder management plan | 21-Dec-20 | 24-Dec-20 |
| Schedule management plan | 28-Dec-20 | 31-Dec-20 |
| Cost management plan | 4-Jan-21 | 8-Jan-21 |
| Quality management plan | 11-Jan-21 | 15-Jan-21 |
| Resource and communication management plan | 18-Jan-21 | 22-Jan-21 |
| Risk management plan | 25-Jan-21 | 29-Jan-21 |
| Procurement management plan | 1-Feb-21 | 5-Feb-21 |

| | | |
|---|---|---|
| Project integration: project management plan | 5-Feb-21 | 12-Feb-21 |
| Chapter V: Conclusions | 15-Feb-21 | 19-Feb-21 |
| Chapter VI: Recommendations | 22-Feb-21 | 26-Feb-21 |
| **Tutor approval** | 26-Feb-21 | 26-Feb-21 |
| **FGP submission to reviewers** | **1-Mar-21** | **19-Mar-21** |
| **Adjustments** | **22-Mar-21** | **16-Apr-21** |
| **Presentation to the board of examiners** | **19-Apr-21** | **23-Apr-21** |
| | | |

## Relevant historical information

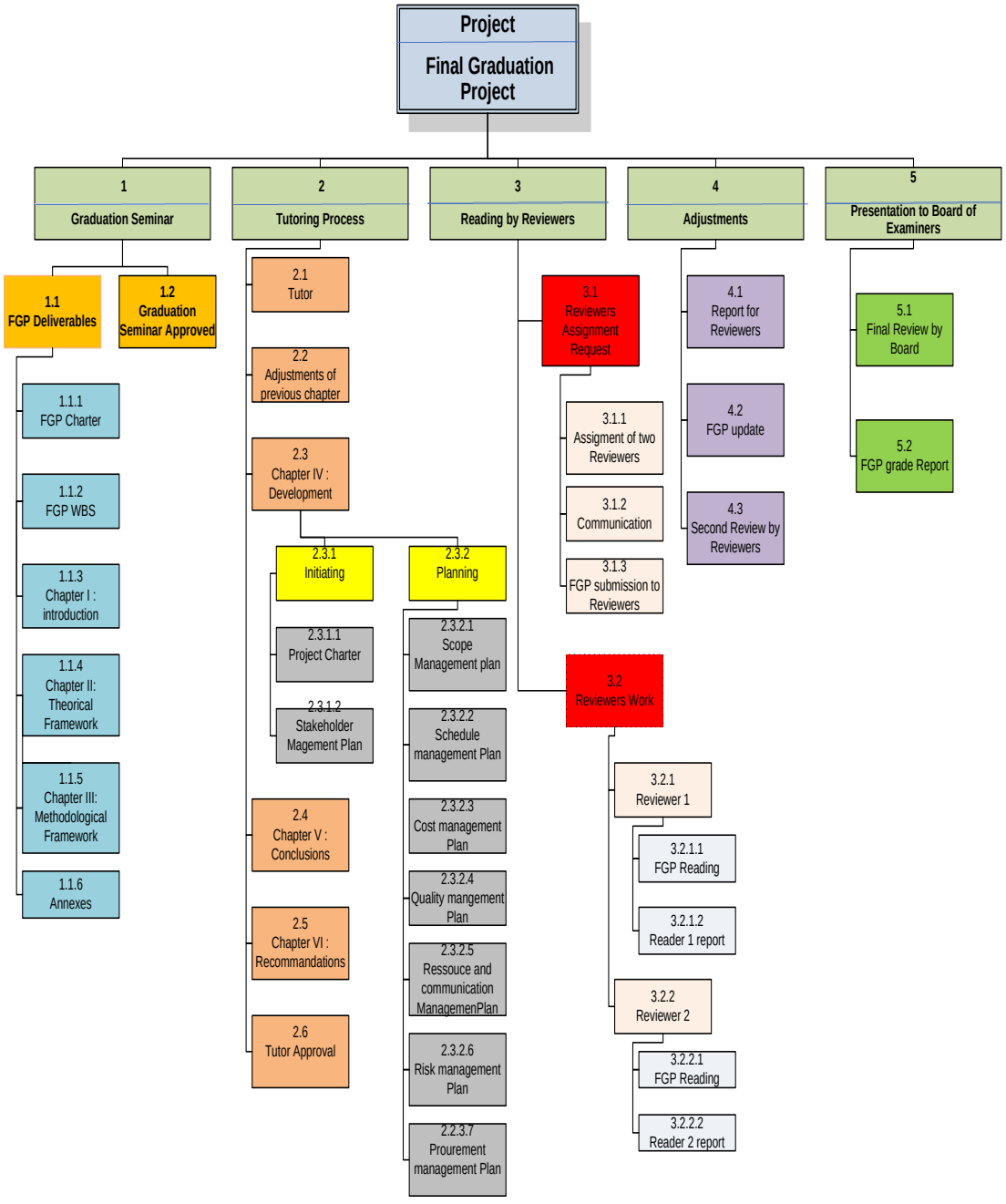
The project is new for the Ministry of Economy and Finance. It will be conceived by a local software development company specialized in database management. It will be financed by a multilateral institution. The documentation of previous works or similar related projects does not exist.

## Stakeholders

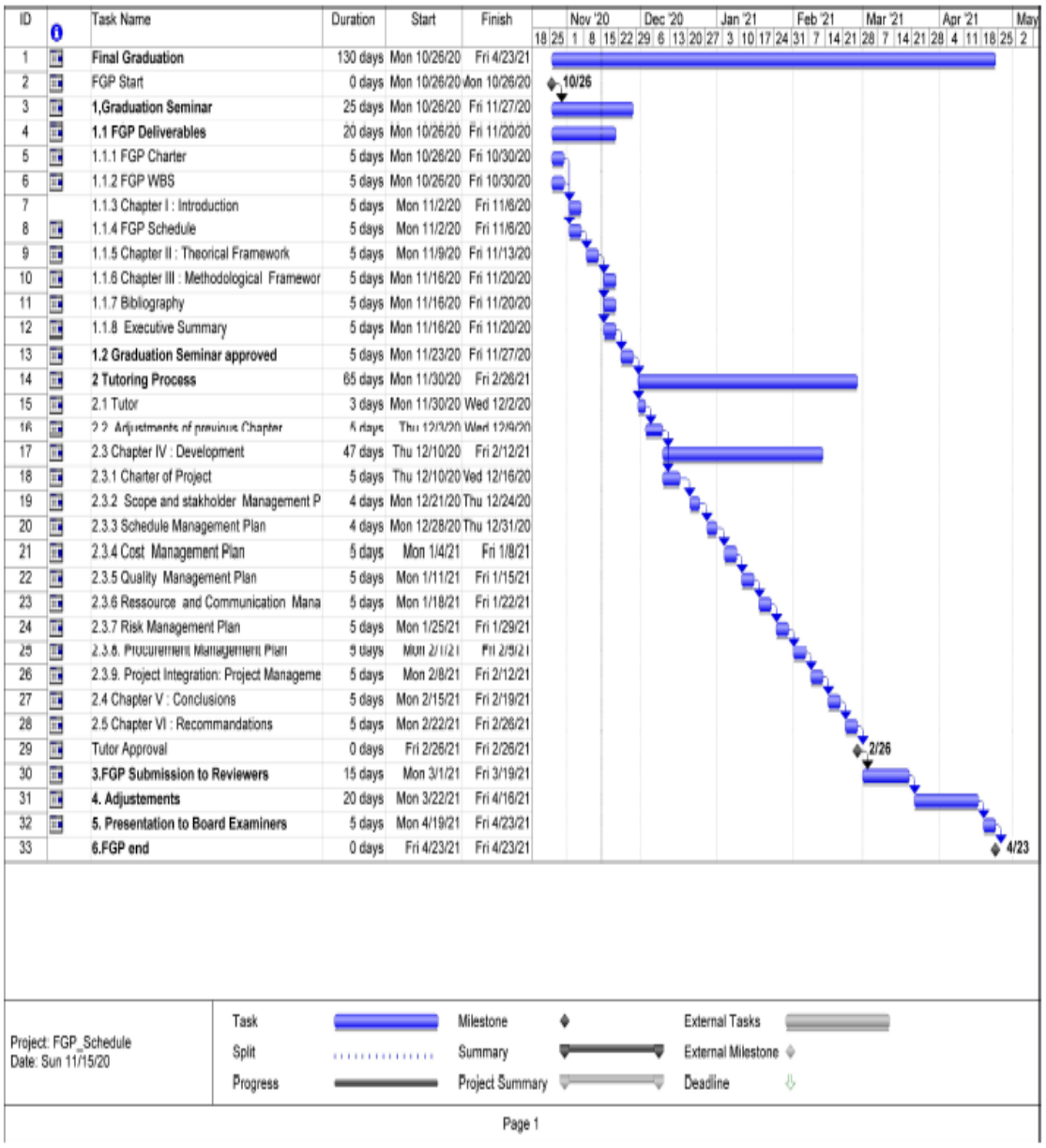
**Direct stakeholders**:
The World Bank (WB)
The Ministry of Economy and Finance
The Economic Division
The software development company
The FGP lecturer
The tutor
The project manager
**Indirect stakeholders:**
The Government of Haiti
The international community

| | |
|---|---|
| **Project Manager:**<br><br>**Gabriel Berny DUVALSAINT** | **Signature:**<br>  |
| **Authorized by:** | **Signature:** |

Appendix 2: FGP WBS



Appendix 3: FGP Schedule



| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | **Final Graduation** | 130 days | Mon 10/26/20 | Fri 4/23/21 |
| 2 | FGP Start | 0 days | Mon 10/26/20 | Mon 10/26/20 |
| 3 | **1,Graduation Seminar** | 25 days | Mon 10/26/20 | Fri 11/27/20 |
| 4 | **1.1 FGP Deliverables** | 20 days | Mon 10/26/20 | Fri 11/20/20 |
| 5 | 1.1.1 FGP Charter | 5 days | Mon 10/26/20 | Fri 10/30/20 |
| 6 | 1.1.2 FGP WBS | 5 days | Mon 10/26/20 | Fri 10/30/20 |
| 7 | 1.1.3 Chapter I : Introduction | 5 days | Mon 11/2/20 | Fri 11/6/20 |
| 8 | 1.1.4 FGP Schedule | 5 days | Mon 11/2/20 | Fri 11/6/20 |
| 9 | 1.1.5 Chapter II : Theorical Framework | 5 days | Mon 11/9/20 | Fri 11/13/20 |
| 10 | 1.1.6 Chapter III : Methodological Framewor | 5 days | Mon 11/16/20 | Fri 11/20/20 |
| 11 | 1.1.7 Bibliography | 5 days | Mon 11/16/20 | Fri 11/20/20 |
| 12 | 1.1.8 Executive Summary | 5 days | Mon 11/16/20 | Fri 11/20/20 |
| 13 | **1.2 Graduation Seminar approved** | 5 days | Mon 11/23/20 | Fri 11/27/20 |
| 14 | **2 Tutoring Process** | 65 days | Mon 11/30/20 | Fri 2/26/21 |
| 15 | 2.1 Tutor | 3 days | Mon 11/30/20 | Wed 12/2/20 |
| 16 | 2.2 Adjustments of previous Chapter | 5 days | Thu 12/3/20 | Wed 12/9/20 |
| 17 | 2.3 Chapter IV : Development | 47 days | Thu 12/10/20 | Fri 2/12/21 |
| 18 | 2.3.1 Charter of Project | 5 days | Thu 12/10/20 | Wed 12/16/20 |
| 19 | 2.3.2 Scope and stakholder Management P | 4 days | Mon 12/21/20 | Thu 12/24/20 |
| 20 | 2.3.3 Schedule Management Plan | 4 days | Mon 12/28/20 | Thu 12/31/20 |
| 21 | 2.3.4 Cost Management Plan | 5 days | Mon 1/4/21 | Fri 1/8/21 |
| 22 | 2.3.5 Quality Management Plan | 5 days | Mon 1/11/21 | Fri 1/15/21 |
| 23 | 2.3.6 Ressource and Communication Mana | 5 days | Mon 1/18/21 | Fri 1/22/21 |
| 24 | 2.3.7 Risk Management Plan | 5 days | Mon 1/25/21 | Fri 1/29/21 |
| 25 | 2.3.8. Procurement Management Plan | 5 days | Mon 2/1/21 | Fri 2/5/21 |
| 26 | 2.3.9. Project Integration: Project Manageme | 5 days | Mon 2/8/21 | Fri 2/12/21 |
| 27 | 2.4 Chapter V : Conclusions | 5 days | Mon 2/15/21 | Fri 2/19/21 |
| 28 | 2.5 Chapter VI : Recommandations | 5 days | Mon 2/22/21 | Fri 2/26/21 |
| 29 | Tutor Approval | 0 days | Fri 2/26/21 | Fri 2/26/21 |
| 30 | **3.FGP Submission to Reviewers** | 15 days | Mon 3/1/21 | Fri 3/19/21 |
| 31 | **4. Adjustements** | 20 days | Mon 3/22/21 | Fri 4/16/21 |
| 32 | **5. Presentation to Board Examiners** | 5 days | Mon 4/19/21 | Fri 4/23/21 |
| 33 | **6.FGP end** | 0 days | Fri 4/23/21 | Fri 4/23/21 |

Appendix4 : Philology Letter

San José, April 30, 2021

Universidad para la Cooperación Internacional

To Whom It May Concern:

Natalia Alvarado Mata, identification number 305030705, Bachelor in English with a focus on translation, hereby states that the project titled: "**PROJECT MANAGEMENT PLAN FOR THE DEVELOPMENT OF AN INTRANET FOR THE ECONOMIC DIVISION IN THE MINISTRY OF ECONOMY AND FINANCES**", carried out by Gabriel Berny Duvalsaint, has been revised.

The project was carried out to obtain the **Master In Project Management (MPM)** Degree. Aspects such as paragraph form, language quirks in written language, orthography, punctuation, and other aspects related to syntax and grammar were inspected and proofread. Therefore, taking into account the changes that were made, the project is ready to be presented.

Sincerely,

Natalia Alvarado

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